

Managing Unintended Consequences in Regional Aid for Trade Infrastructure Projects: The Case of the International Network of Mesoamerican Highways (RICAM)

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Abstract

We focus on the International Network of Mesoamerican Highways (RICAM), which forms part of the Mesoamerican Integration and Development Project. RICAM is a trade-related infrastructure project that aims to promote regional development through trade. It will facilitate the transportation of goods and people by reducing travel time and improving border efficiency in the transportation corridor between Mexico and Colombia.

We propose that the RICAM project adopt measures to reduce the risk that this transportation corridor becomes a focal point for the transmission of HIV/AIDS and associated sexually transmitted diseases. Central America has some of the highest HIV infection rates in the hemisphere. The association between trucking routes, trade and HIV transmission has been well-documented in other settings. However, prevention programs in India and Africa have succeeded in reducing HIV transmission along transportation corridors. We recommend that similar prevention programs be implemented for RICAM.

Introduction

The International Network of Mesoamerican Highways (RICAM) forms part of the Mesoamerican Integration and Development Project. RICAM is a trade-related infrastructure project that aims to promote regional development through trade. It will facilitate the transportation of goods and people by reducing travel time and improving border efficiency in the transportation corridor between Mexico and Colombia.

The United Nations Millennium Development Goals (MDGs) are eight international development goals that all 192 members and a number of international organizations have agreed to achieve by the year 2015 to end poverty. They include reducing extreme poverty, reducing child mortality rates, fighting disease epidemics, such as HIV/AIDS, and creating a global partnership for development.¹ The strengthening of the multilateral trading system through the conclusion of the Doha Development Agenda and Aid for Trade are the contributions that the World Trade Organization (WTO) has to make to this goal.² The main goal that concerns the WTO is MDG 8, building a global partnership for development. However, WTO activities must ensure coherence with the other goals, since the MDGs cannot be seen in isolation.

Aid for Trade is one of the WTO's contributions to realizing the MDGs. However, the MDGs are interconnected and include fighting disease epidemics, such as HIV/AIDS. Given the relationship between trade, transportation corridors and the spread of HIV/AIDS, Aid for Trade infrastructure projects, such as the RICAM project, need to integrate strategies to mitigate negative effects on other MDGs, in particular the goal of fighting disease epidemics. Facilitating trade and travel can have unintended consequences that risk reducing the development potential of the RICAM project. The principal risk that we address is HIV transmission along the transportation corridor. The negative economic impact of HIV/AIDS has been well-documented, as have the consequences for development.

Thus, while this article focus on the trade-related infrastructure program of the Mesoamerican Integration and Development Project, the main issue we address is how to ensure that trade and transportation corridors do not undermine the MDG of fighting disease epidemics, especially HIV/AIDS. In addition, we raise other issues that may undermine the goals of the RICAM project: the Mexico-United States trucking dispute and the problem of illegal migration between Mesoamerican countries and the United States.

We propose that the RICAM project adopt measures to reduce the risk that this transportation corridor becomes a focal point for the transmission of HIV/AIDS and associated sexually transmitted diseases. Central America has some of the highest HIV infection rates in the hemisphere. The association between trucking routes, trade and HIV transmission has been well-documented in other settings. However, prevention programs in India and Africa have succeeded in reducing HIV transmission along transportation corridors. We recommend that similar prevention programs be implemented for RICAM.

We also consider other potential unintended consequences of the RICAM project: increased illegal migration, facilitation of international drug trafficking and the spread of other diseases, such as influenza and plant diseases. The solutions to these potential problems are less obvious than the case of HIV transmission. In addition, we highlight the need to facilitate efficient transportation and border crossing from Mexico to the

United States, in order to realize the full development potential of RICAM, and to ensure enforcement of size and weight restrictions on trucks, in order to maximize the lifespan of the infrastructure.

Objectives

The Mesoamerican Integration and Development Project was launched in June 2001 (then known as the Puebla-Panama Plan) to facilitate and advance the process of integration and development in the Mesoamerican countries (Mexico, Guatemala, Belize, El Salvador, Honduras, Nicaragua, Costa Rica and Panama) – with Colombia joining in 2006.³ The objectives pursued by the trade-related infrastructure investments in this project Mesoamerica Project are to connect markets, reduce transport and trade costs, enhance trade competitiveness, improve the climate for foreign investment, and deliver goods and services to world markets more efficiently.⁴ The International Network of Mesoamerican Highways (RICAM) is the project's major transportation infrastructure program.⁵

RICAM aims to achieve full physical integration, shorten travel distances on north-south and coast-to-coast routes, make border crossings more efficient and introduce international rules and standards for vehicular transit and homogenous weight and dimension regulations.⁶ The objective is to interconnect the region with smooth and safe communication routes in order to improve access to export markets and promote tourism.⁷ Financing for the project comes from the private sector, the governments themselves and external donors (which include the IADB, the Central American Bank for Economic Integration, the Andean Development Corporation, the World Bank, Mexico, Japan, Taiwan, Norway and the United States).⁸ The stated purpose of RICAM is "to connect populations, productive zones and the main points of distribution and embarkation of goods aimed to open new possibilities for the integration of Mesoamerica and place its production within reach of markets by overland routes, connecting populations and productive zones."⁹

The objective of this article is to understand better the outcomes and impacts of Aid-for-Trade activities and approaches regarding transportation infrastructure. The RICAM project involves different groups of countries (low-income, middle-income and small economies) and different development actors (bilateral, multilateral and South-South). This project faces challenges that are unique to the project in some respects. However, in other respects, this project faces similar challenges to those faced in other developing regions of the world. As a result, this article can enrich the global discussion on how to improve the effectiveness of Aid for Trade infrastructure projects.

Infrastructure and Aid for Trade are related issues. The OECD (2006) lays out the basic dimensions of Aid for Trade.¹⁰ It categorizes infrastructure and transportation as supply side constraints. The World Bank (2009) has shown that middle-income countries get most infrastructure loans from both bilateral and multilateral loan/donor agencies (Table 4).¹¹ It also notes that the lower the level of economic development, the higher the barriers for goods to cross borders (Figure 5). Gamberoni and Newfarmer (2009) provided the key insight that Aid for Trade as a percentage of GDP is strongly positively influenced by infrastructure expenditure. Better infrastructure in a country attracts more Aid for Trade.¹² There is also a difference in terms of how multilateral versus bilateral

donor agencies differ in terms of Aid for Trade. Multilateral donors give 93 percent to low income countries. In contrast, bilateral donors give 46 percent to low income countries. The rest goes to middle-income countries.¹³ Mexico is a middle-income country. The other countries in our study are either middle or low-income. Our study is thus goes to the heart of Aid for Trade.

RICAM Design and Implementation

Mexico's geographic location, together with its membership in the North American Free Trade Agreement (NAFTA), makes it a gateway to the North American market for Central America. Mexico also has free trade agreements with several Central American countries: Costa Rica, Nicaragua, El Salvador, Guatemala and Honduras. Mexico also has been negotiating free trade agreements with Panama and Belize. This proliferation of regional trade agreements has led to the next logical step: a plan to improve the infrastructure between Mexico and its southern neighbors. In addition, the United States has negotiated free trade agreements with Central American countries and Colombia. The RICAM project also will improve the trade infrastructure connecting these countries to the United States market and Canada. Tables 1 and 2 list the regional trade agreements involving Latin America and the Caribbean.

Table 1: Trade Agreements in LAC, South–South Agreements

Participating Countries/Trading Blocs	Year of Signature
Central American Common Market (CACM)	1961
Caribbean Community (CARICOM)	1973
Customs Union	
Andean Community (CAN)	1988
Southern Cone Common Market (MERCOSUR)	1994
Latin American Integration Association (ALADI)	1980
Global System of Trade Preferences among Developing Countries (GSTP)	1989
Preferential Trade Agreements	
Chile - India	2007
Programa de Integración y Cooperación entre Argentina y Brasil (PICAB)	1986
Central American Integration System (SICA)	1993
Chile-Venezuela	1993
Bolivia-Mexico	1994
Group of Three (G-3)	1994
Costa Rica - Mexico	1995
Bolivia-MERCOSUR	1996
Chile-MERCOSUR	1996
Chile-Peru	1998
Mexico - Nicaragua	1998
Chile - Mexico	1999
Chile- Central American Common Market (CACM)	1999
CARICOM-Dominican Republic	2000
Mexico-Northern Triangle of Central America	2000
El Salvador - Mexico	2001
Free Trade Agreements	
Guatemala - Mexico	2001
Chile - Costa Rica	2002
Costa Rica-Trinidad and Tobago	2002
MERCOSUR - Comunidad Andina	2002
MERCOSUR - Perú	2003
Panama - El Salvador	2003
Bolivarian Alliance for the Americas (ALBA)	2004
CARICOM - Costa Rica	2004
MERCOSUR - India	2004
MERCOSUR - Colombia	2005
Chile - PRC	2006
Panama - Chile	2008
Panama - Costa Rica	2008
Union of South American Nations (UNASUR)	2008
Chile - Colombia	2009

Brazil-PRC	T.B.A
Brazil-Russia	T.B.A
Central American Common Market - Dominican Republic	T.B.A
Mexico-Ecuador Under Negotiation	T.B.A
Mexico-Panama	T.B.A
Mexico-Peru	T.B.A
Mexico-Trinidad and Tobago	T.B.A

Source: WTO Secretariat; IDB (2002).

Table 2: Trade Agreements in LAC, North–South Agreements

Participating Countries/Trading Blocs	Year of Signature
North American Free Trade Agreement (NAFTA)	1994
Canada - Chile	1997
Mexico-European Union	1999
Israel - Mexico	2000
European Free Trade Association - Mexico	2001
Canada - Costa Rica	2002
Chile-European Union	2002
European Free Trade Association - Chile	2004
Korea, Republic of - Chile	2004
Panama and the Separate Customs Territory of Taipei,China, Penghu, Kinmen and Matsu	2004
United States - Chile	2004
Japan - Mexico	2005
Dominican Republic - Central America - United States Free Trade Agreement (CAFTA-DR	2006
Free Trade Agreements	
Panama - Singapore	2006
Trans-Pacific Strategic Economic Partnership	2006
Chile - Japan	2007
MERCOSUR- Israel*	2007
United States - Panama	2007
Canada - Colombia	2008
EC - CARIFORUM States Economic Partnership Agreement	2008
European Free Trade Association - Colombia	2008
Nicaragua and the Separate Customs Territory of Taiwan, Penghu, Kinmen and Matsu	2008
Australia - Chile	2009
Canada - Peru	2009
Peru - Singapore	2009
United States - Peru	2009
Canada - El Salvador - Guatemala - Honduras - Nicaragua	T.B.A.
Korea, Republic of - Mexico	T.B.A.
Canada - Caribbean Community	T.B.A.
Canada - Dominican Republic	T.B.A.
European Free Trade Association - Peru	T.B.A.
Under Negotiation	
Andean Community - European Union	T.B.A.
Central American Common Market - United States	T.B.A.
Caribbean Community-European Union	T.B.A.
Mercosur-European Union	T.B.A.
Uruguay-United States	T.B.A.

Source: WTO Secretariat; IDB (2002).

Design of the Plan Puebla-Panama

On June 16, 2001, in a summit between the Mexican President Vicente Fox and his counterparts in Central America, the Plan Puebla-Panama was announced. It was to be known as the "Plan of the three P's," to promote tourism, trade, education, healthcare and environmental protection and to speed up travel between the countries. It also envisioned connecting power grids from Mexico's Puebla state to Panama. Mexican President Vicente Fox and the leaders of the seven Central American countries signed a joint declaration on the plan. President Fox argued that such a plan would "end the backwardness of the region in order to incorporate it fully in the corridors of world commerce." Mexico and Central America hoped "to build both literal and metaphoric bridges between their countries with a sweeping new economic development plan." The countries would have 25 years to implement the plan in its entirety.

The plan is to have one corridor through the Pacific Coast and another through the Atlantic Coast with connections in-between (see map in Appendix 1). The financing of RICAM is designed as a public-private partnership. Nearly 45 percent of the funds came from the respective governments (with the largest share coming from Mexico). Another 26 percent came from private parties. The remainder came from international organizations, with the Inter-American Development Bank in the lead (see Table 3).

Table 3: Financing RICAM

Institution	Amount in millions dollars	Percentage of total
Governments	3,617	44.53%
Private	2,134	26.27%
Inter American Development Bank	698	8.59%
Central American Bank	626	7.71%
Andean Financial Confederation	158	1.95%
Japan Bank of International Cooperation	225	2.77%
Millennium Challenge Corporation	308	3.79%
Others	355	4.37%
Total	8,122	100.00%

Source: PPP website.

The original plan was to complete the highway and other infrastructure projects, as well as programs to improve education and health services, within five years. It did not turn out that way. There was resistance from different quarters. The first series of protests against the plan came from the teachers union in Chiapas and the Zapatista rebels from the same region. They argued that the plan would wipe out the indigenous culture of the region through widespread sale of land, roads and businesses.

Health issues were a key component of the design of the Plan Puebla Panama. In a talk to introduce the plan, then Health Secretary of Mexico, Julio Frenk, characterized the health aspect in the following terms:

We know that in the Mesoamerican region geographical and ecological conditions are similar. In the region, we still have high levels of poverty. The patterns of migration are important. We also have health issues in the region. If we think that the main purpose of the Plan Puebla-Panama is greater integration, we must infer that the integration is also accompanied by the international transfer of risks to health.

Pulmonary tuberculosis, the major issue of HIV/AIDS and other sexually transmitted infections, vector-borne diseases, obviously do not travel with a passport. Therefore, they need to have common strategies – particularly in dengue, malaria and onchocerciasis (River Blindness).¹⁴

The Mexican Health Secretary pointed out that several diseases travel with people, including migrant workers and truck drivers. However, none of the documents from the sponsoring governments and international organizations addresses health and transportation issues in an integrated fashion. Building highways and increasing intraregional trade will produce more truck drivers and more migration (legal or otherwise). Thus, this process will increase the transmission of diseases like HIV/AIDS and other sexually transmitted diseases.

(Re)Design of the Mesoamerica Project

Up until 2008, the Plan Panama Puebla included one large country (Mexico) and seven smaller Central American countries: Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua and Panama. In 2008, the Plan was renamed the Mesoamerica Project and incorporated a South American country that was not part of the original plan (Colombia).

On 28 June 2008, the new plan was announced.¹⁵ The Mesoamerica Project was broadened to include two broad new themes: (1) Integration for Productivity and Competitiveness (which includes transportation, energy, integrated telecommunications, trade facilitation and competitiveness, and biofuels) and (2) Human Development and Environmental Concerns (which includes health, climate change, housing, and rural development).

RICAM was expanded to cover 13,132 kilometers of highways. It includes 5 corridors: 2 main roads (Pacific and Atlantic), the Caribbean Tourist Corridor, the Inter-oceanic Corridors, and the associated branches and linking roads. When it is finished, it will connect Mexico and Colombia and will allow the transportation of non-perishable goods from the countries of Central America to the southern distributions centers in the United States in six days, compared with the two weeks it would take in 2010.

The highway network consists of the following:

The Pacific Corridor: This is the largest component of the highway integration project. It is 3,152 kilometers long and has six border crossings and through seven countries, starting in Puebla, Mexico, and ending in Panama. It is projected to be the main logistical corridor, with the capacity to transport 95 percent of the goods in the region. The plan is for this highway to meet international standards in traffic and highway security and to establish the shortest route between Mexico and Panama.

The Atlantic Corridor: This stretch will be 2,906 kilometers long. It is intended for commercial transportation and as a tourist corridor.

The Caribbean Tourist Corridor: This stretch will be 1,446 kilometers long. It is intended to connect various locations in order to maximize the tourist potential of the Caribbean coast and the Mayan jungle.

The Inter-oceanic Corridors: This stretch will be 1,374 kilometers long and serve commercial freight and logistical services. These corridors cross different countries from one coast to the other, like "dry canals".

Branches and links: This stretch will be 4,225 kilometers long, connecting the main roads by alternate routes.¹⁶

The redesign of the Plan Puebla-Panama also expanded the public health aspects of the Mesoamerica Project. The justification for expanding the public health initiative was expressed in the following terms:

The Mesoamerican region, which includes the states of South-Southeast of Mexico, Central America and Colombia has an estimated population of 118.5 million inhabitants, which faces significant health challenges that require joint attention, among them:

- More than 500,000 pregnant women each year have no perinatal care and childbirth, accounting for 19 percent of total population in the region
- More than 15 million people at high risk of contracting dengue fever or malaria (13 percent of the total population)
- More than 900,000 children lack basic vaccination (8 percent of total)
- More than 400,000 newborns suffer from nutritional deficiency.

These common problems would find more effective solutions if we could pull together the public policies and health interventions among nations and regions. It is agreed that this regional structure facilitates convening various funding sources, which would complement the resources invested by governments at national level to achieve a greater impact on outcomes that improve the quality of life of the inhabitants of the region.

This is why there is a unique opportunity to create jointly a Mesoamerican Public Health Initiative to address, directly, problems such as malnutrition, vector-borne diseases and maternal mortality, and would at the same time to improve prevention systems in each country and strengthen vaccination programs and epidemiological surveillance systems.¹⁷

The Mesoamerica Project is thus more ambitious in design than the original Plan Puebla-Panama.

Implementation of the Mesoamerica Project

By mid-2008, half of the RICAM construction and modernization projects had been completed. By the end of 2009, nearly eighty percent of the transport projects were either completed or under construction. In October 2009, a highway linking El Ceibo, Tabasco, Mexico with Lagunitas, Peten, Guatemala was inaugurated with the aim to link the south-east of Mexico with Central America for commerce supporting farming, industry and tourism. The idea behind this stretch of highway is to join up tourist destinations such as Palenque, in the Mexican state of Chiapas, and Tikal, Guatemala, with the Mexican state of Tabasco and to open up new trade routes between Mexico and Central America. By December 2009, seventy percent of the highway network had already been modernized. By the end of 2010, the highway from Champoton to Cancun or the highway from Ciudad del Carmen to Tulum were to be completed.

To facilitate the public health initiative, an institute was created with initial funding of 6 million dollars from the Gates Foundation and the Carso Foundation. The institute has four main focuses:

- Malaria and dengue
- Child malnutrition
- Maternal and Child Health
- Vaccines for preventable diseases¹⁸

However, there is no evidence that the implementation of the public health initiative is addressing the risk that increased migration and greater movement of truck drivers will increase the spread of sexually transmitted diseases across the region.

Another aspect of the project that remains unclear is the manner in which maximum sizes and weights for trucks will be enforced. This is an important issue, since wear and tear on roads and bridges will occur more quickly if maximum sizes and weights are not adequately enforced. This in turn will reduce the life of the infrastructure and result in more accidents on the highways.¹⁹

Design Flaws and Unintended Consequences

Participants at the 2007 Aid-for-Trade Regional Review for Latin America and the Caribbean recognized that, while trade can play a central role in reducing poverty in the region, it can be only one element of the development strategy. There was a consensus that complementary policies are needed to strengthen the linkages between trade, economic growth, poverty reduction, social inclusion, and sustainable development.²⁰ The problems that we have encountered with the RICAM project are related to the failure to address three specific complementary policies that are necessary to ensure that unintended consequences do not undermine the development potential of the project: (1) measures to mitigate the spread of sexually transmitted diseases, including HIV/AIDS; (2) the resolution of the trucking services dispute between Mexico and the United States; and (3) more effective policies to address illegal migration from Mesoamerica to the United States. We analyze these problems in turn.

The Choice: AIDS for Trade or Safe Trucking

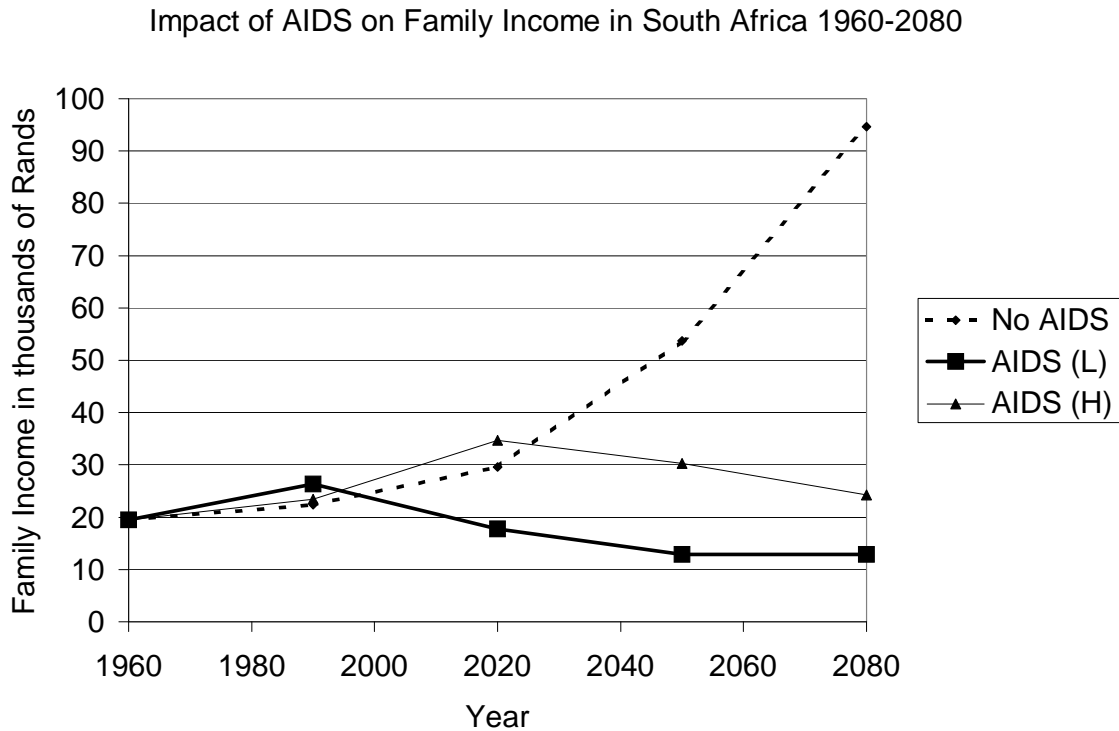
It is difficult to predict the impact of HIV/AIDS on economic development. In theory, rising HIV/AIDS prevalence could cause the labor participation rate to rise, to fall or to remain the same. Rising rates of HIV/AIDS would reduce the supply of labor, but would also reduce the population. If HIV/AIDS were to reduce the supply of labor and the population to the same degree, then labor per capita would remain the same. Since HIV/AIDS strikes the population at a productive age, it may reduce the labor force more than the entire population, and the labor participation rate would fall. However, a decline in the supply of labor would lead to a rise in capital per labor unit in the short run. Nevertheless, in the long run, the supply of capital may fall if rising HIV/AIDS leads to less saving and investment.²¹

Falling life expectancy and rising mortality due to HIV/AIDS may lead to lower future economic growth due to the importance of human capital for long-term accumulation of wealth. On the societal level, an HIV/AIDS epidemic can affect the size, growth rate and age and skill composition of the future labor force. In addition, the slow-moving nature of HIV/AIDS produces higher costs of treatment and palliative care than epidemics that kill quickly. These additional costs can decrease GDP growth by reducing savings and investment. On the individual level, HIV/AIDS can reduce income and increase costs. The diminished working capacity of individuals with HIV/AIDS reduces income and lower life expectancy reduces lifetime. Higher costs, such as medical expenses and caring for orphans, lead to less education for children and lower savings.²²

HIV/AIDS destroys human capital in a number ways and reduces that transmission of human capital between generations, leading to declining levels of education. However, it is difficult to determine the impact of HIV/AIDS on all macroeconomic variables. For example, rising incidence of HIV/AIDS can lead to rising or falling total fertility rates, which also affect human capital and economic growth. As a result, the impact of HIV/AIDS on overall economic welfare, in the form of changes to GDP, remains unclear.²³

A key factor of for long-term accumulation of wealth in a given country is its human capital. There are two critical elements of HIV/AIDS that suggest a negative impact on human capital and, therefore, economic development. First, HIV/AIDS affects people who are sexually and economically active. This is in stark contrast with other important diseases like malaria. Therefore, the HIV/AIDS epidemic affects the size, growth rate and age and skill composition of the future labor force that feeds into the growth rates of potential output and of productivity. Secondly, unlike other killer diseases, like the bubonic plague or influenza, HIV/AIDS is slow moving, both within society and also within the human body. As a result, society must bear high costs of treatment and palliative care relative to other comparable killer diseases. This affects the level and composition of future consumption demand of households (as they have to incur additional private costs) and of governments (that have to provide public health services). These additional costs dampen savings and investment, thereby reducing the future GDP growth rate. The economics of HIV/AIDS is therefore quite distinct from other diseases with similar epidemiological and demographic characteristics. In the long run, HIV/AIDS can trap a country in poverty for many generations.²⁴ Figure 1 projects the impact of HIV/AIDS on family income in South Africa.

Figure 1 Projection of Family income in Bell, Devarajan and Gersbach Model



It is well-known that migration, travel and trade are prime drivers of epidemics from one place to another. For example, we have seen how air travel can affect the spread of infectious diseases like SARS and influenza and how trade routes and people movement converted the Spanish Flu of 1918 into a worldwide pandemic.²⁵ McNeill (1976) noted how renewed trade networks spread the Black Death in the Middle Ages. New shipping lines not only brought goods faster; it also brought the plague to the rest of Europe.²⁶ Thus, it is logical to see the spread of HIV/AIDS as a consequence of rising trade. That the geographical locations of trade routes have something to do with HIV/AIDS has been known for some time.

Klitsch (1992) was the first to note that, in Uganda, trade routes have had a clear relationship with HIV. He estimated that 62% of men and 30% of women in the main road trading centers had more than 2 sexual partners in the previous 5 years. Men were more likely to be seropositive if they lived in trading centers or villages. Compared with the rest of the population, men had 3 to 5 times more risk of being seropositive. Given the evidence, Klitsch deduced that “HIV transmission follows trade routes, and is probably linked to commercial sex. Rural trading villages may spread HIV to more rural villages.”²⁷

Steinbrook (2007) examined the past evidence in India, and concluded, “India has perhaps 5 million truck drivers. About half drive long-distance routes that keep them away from home for a month or more; often they have a young male helper. Truckers are more likely than other men to be clients of sex workers, and sex work is common along

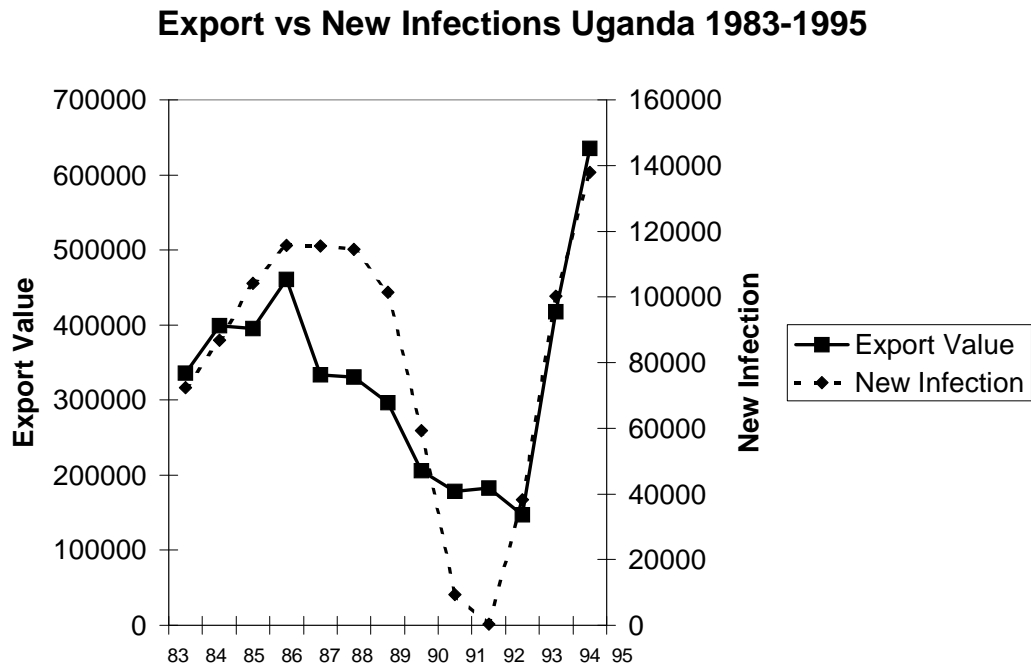
major truck routes. The Golden Quadrilateral, an express highway that links India's four largest cities – New Delhi, Mumbai, Chennai, and Kolkata – traverses many areas where the rate of sexual transmission of HIV is high.”²⁸

Okware (2007) noted that in all the sites in Uganda that had showed a clearly declining trend in HIV/AIDS began to show a rise between 2003 and 2005.²⁹ Why did the prevalence in Uganda decline during 1993-2001 and why did it rise after that? Oster (2007) found evidence that a large portion of such changes can be explained by changes in exports.³⁰ This research confirmed the relationship trade and the propagation of HIV that had been observed by other researchers, like Klitsch and Steinbrook.

Oster (2007) built a model of the HIV epidemic, making explicit how HIV and economic activity may be linked. For the model, she notes: “The model builds on three observations. First, truck drivers and other migrants (i.e., those who spend time living or traveling away from home) tend to have more sexual partners than the average person. Second, the sexual partnerships these people have away from home tend to be higher risk than those they have at home, largely because their partners are more likely to be infected: for example, are more likely to be bar girls or commercial sex workers. Third, the partners (for the most part, wives) of those who travel may be more likely to have additional sexual partners while their spouses are away. These observations suggest that in times when there are more people traveling, there may be more HIV infections; that link is formalized in the model here. I begin by describing the model setup and then discussing the predictions. At the end of this section I provide evidence for the other necessary link here namely, a positive relationship between economic activity (exports) and the share traveling away from home. In addition to generating an overall connection between HIV and exports, the model also makes additional predictions about how this relationship should vary across groups and initial conditions.”

She then applied the model to export data from Uganda. Ugandan exports are extremely closely tied to coffee. It was the principal export of Uganda in the 1980s and the 1990s. What she finds is the remarkable relation between exports and incidence for Uganda, illustrated in Figure 2. In addition to Uganda, she applies the same methodology for Burkina Faso, Cameroon, Kenya, Malawi, Mali, Zambia and Zimbabwe. The results hold up for all countries, in varying degrees.

Figure 2 Exports versus HIV Incidence for Uganda



Source: Oster (2007).

Oster (2007) also notes the policy implications: “This result on Uganda has obvious, potentially important, policy implications. The connection between exports and HIV in general also suggests specific avenues of HIV prevention. In particular, the implication that truckers and other migrants is a very important driver of the overall epidemic supports targeting prevention activities at that group (similar to the targeting done of prostitutes in Thailand). In addition, if increases in economic activity make the HIV epidemic worse, it suggests that aid groups aiming to increase growth should do so in collaboration with those seeking to decrease HIV.”

Evidence from Uganda regarding the connection between exports and HIV suggest that targeting prevention at vulnerable groups would be an effective strategy in generalized HIV epidemics. Increased exports lead to increased transportation of goods and people movement. Truckers and other migrants are important drivers of the overall epidemic, which means that targeting prevention activities at that group would decrease HIV transmission. In addition, if increases in economic activity make the HIV epidemic worse, economic growth strategies need to incorporate HIV prevention strategies.³¹ This is particularly true in the case of trade-related transportation infrastructure.

The lesson for RICAM is clear. Achieving the development goals of the trade infrastructure project could be compromised over the long run unless prevention strategies are implemented to avoid the potential economic impact of increased HIV/AIDS transmission in the Mesoamerican region. Central America has some of the highest infection rates in the hemisphere. In Table 4, we set out the data on HIV/AIDS in the Project Mesoamerica Zone. We also include several other countries that are contiguous to the region. India and Africa demonstrate relationship between trucking routes and spread of HIV/AIDS. The migration and transportation that will increase with

the RICAM project will also be a factor in HIV/AIDS infection patterns between the United States and Mexico and Central America.

Table 4: HIV/AIDS in the Project Mesoamerica Zone

Country	Total infected	Infection Rate
Belize	3,600	2.1
Colombia	170,000	0.6
Costa Rica	9,700	0.4
El Salvador	35,000	0.8
Guatemala	59,000	0.8
Guyana	13,000	2.5
Honduras	28,000	0.7
Mexico	200,000	0.3
Nicaragua	7,700	0.2
Panama	20,000	1.0
Suriname	6,800	2.4
Total	1,700,000	0.5

Source: <http://www.avert.org/southamerica.htm>

There is good news, however. Prevention strategies that have been used along transportation corridors in India and Africa appear to be working. After getting complaints from NGOs, the North South Corridor Project in Africa decided to set aside funds for medical treatment and distribution of condoms for the truck drivers and the sex workers who service them.³² In addition, the North Star Alliance has set up information centers in parts of Africa.³³ The North Star Foundation Annual Report notes that they have had 30,000 visits to their community centers along with the distribution of 150,000 condoms.³⁴

In India, the Bill & Melinda Gates Foundation has committed USD 258 million to Avahan (which means Call to Action in Sanskrit), an AIDS prevention initiative established in India in 2003. Through the Avahan program, the foundation is working to expand access to effective prevention in the six states with India's highest infection rates and along the nation's major trucking routes.³⁵ By 2009, Avahan had increased its budget to USD 338 million.³⁶

The key intervention elements of Avahan are: (1) peer-to-peer outreach; (2) STI testing and treatment; (3) condom distribution; (4) community mobilization and program ownership; (5) stigma reduction; and (6) access to HIV testing, care, and treatment. By the end of 2008, Avahan had distributed 12 million condoms and contacted 240,000 *high risk* individuals through 6,400 peers. These high risk individuals include female sex workers, high-risk men who have sex with men and injecting drug users. In addition, Avahan disseminated information to some 8 million *at risk* individuals.

Initially, the Avahan Program was not a big success. Its success is due to the changes made through constant monitoring and intervention. The truckers program of Avahan is run by the India's largest trucking company, the Transport Corporation of India Foundation (TCIF). In 2003, the TCIF set up intervention sites at 36 locations along the national highways. By 2005, it became clear that it was only reaching 12 percent of

the target population. The service uptake was half of that. A survey showed that half of the outreach was getting misdirected to low risk individuals, such as short-distance truckers and transshipment workers, and not reaching the long-distance truckers.

In response, the TCIF decided to concentrate their services at 17 hubs where the main traffic was long distance trucks. They also introduced standardized facilities that were staffed by trucker peers. The idea of standardization came from the operations of the MacDonald's and the peer-to-peer distribution was inspired by Tupperware.³⁷ Within two years, the outreach/clinic services uptake doubled, condom sales increased 50 percent, and over 85-90 percent of services reached long-distance truckers.³⁸ The results can be seen in Appendix 2 and Appendix 3. Appendix 2 shows that the initial 36 locations were serving some 5,380 truckers per location. By 2008, while the number of locations served fell to 17, the number of truckers served per location quadrupled, making the *total number* of truckers served actually increase (not just per location).

Appendix 3 demonstrates the clear impact of the program in terms of outcomes. Between 2003 and 2006, the sites with Avahan interventions show a significant decline in the proportion of women who are HIV positive in the Antenatal Clinics compared to locations where Avahan did not intervene.

A similar prevention program would mitigate the risk along RICAM transportation routes. The Gates Foundation is funding part of the healthcare initiative in the Panama Puebla Project.

It is important to note that the prevention strategies used for HIV/AIDS are not likely to be suitable to prevent the transmission of other diseases along the transportation corridor. For example, in the case of fast-moving and highly contagious diseases like influenza, closing borders and restricting trade won't work, nor will the kinds of measures that will work for AIDS. The recent H1N1 influenza pandemic demonstrated this.³⁹ So our recommendations are limited to slow-moving diseases like AIDS and not applicable to fast-moving diseases like influenza.

Another important objective is to ensure that the spread of plant diseases is reduced to a minimum. Australia has shown how this is possible with banana cultivation. Three main diseases that afflict bananas, Black Sigatoka, Panama Disease and Banana Bunchy Top Virus (BBTV), have been restricted to certain geographical areas of Australia. It would be useful to deepen research on this aspect of international transportation projects.

Efficiency Obstacles: Mexico-United States Trucking Dispute

It is well known that the cost of transportation has an impact on trade. Limão and Venables (2001) used several sources of evidence to explain transport costs and trade flows. In particular, they study the infrastructures of the trading countries, and of countries through which they trade. With data from a range of countries, they show that a deterioration of infrastructure from that of the median country to the 75th percentile raises costs by an amount equivalent to 3466 km of sea travel or 419 km of overland travel. Their estimate of the elasticity of trade flows with respect to the transport cost factor was -3. As a consequence, the doubling of transport costs would reduce trade volumes by 45 percent.⁴⁰

Part of the logic of the RICAM project is to facilitate access to the NAFTA export market, in addition to expanding trade opportunities within the Mesoamerican market itself. One of the strategies involves harmonizing trucking standards and speeding up cross-border transportation. However, trucking standards have not yet been harmonized in the NAFTA region itself.⁴¹ Moreover, the ongoing Mexico-United States dispute over trucking services is an obstacle to further enhancing cross-border transportation efficiency between Mexico and the United States. Without an effective resolution of the US-Mexico trucking dispute and harmonization of North American trucking standards, the RICAM project will not be as effective or efficient as it otherwise could be.

Prior to 1980, the United States granted operating authority to motor carriers for each individual route, without distinguishing between United States, Mexican, or Canadian applicants. In 1980, the Motor Carrier Act made it easier for motor carriers from all three countries to obtain operating authority. It still did not distinguish between nationals and foreigners. In 1982, the Bus Regulatory Reform Act imposed an initial two-year moratorium on the issuance of new motor carrier operating authority to foreign carriers. A presidential memorandum immediately lifted the moratorium with respect to Canada in response to the Brock-Gotlieb Understanding, which confirmed that U.S. carriers would have continued access to the Canadian market. The same memorandum declined to lift the moratorium with respect to Mexico, citing U.S. truckers' continued lack of access to the Mexican market.

The U.S. president repeatedly extended the moratorium against Mexican truckers every two years from 1984 to 1995. The purpose of the moratorium was to encourage Mexico to lift its restrictions on market access for U.S. firms. However, there were several exceptions allowed to facilitate cross-border trade. One exception permitted Mexican carriers to operate in the commercial zone of border towns, provided they obtained a certificate of registration from the Federal Motor Carrier Safety Administration. A second exception allowed Mexican operators to transit through the United States to Canada. A third exception grandfathered Mexican trucking companies that had acquired operating authority prior to 1982. A fourth exception exempted U.S.-owned Mexican-domiciled truck companies from the operation of the moratorium. A fifth exception allowed Mexican carriers to lease both trucks and drivers to U.S. carriers until January 1, 2000.

Under NAFTA, a moratorium remained in place on new grants of operating authority for persons from Mexico. However, the United States agreed to phase out the moratorium so that Mexicans would be permitted to obtain operating authority to provide cross-border truck services to or from border-states (California, Arizona, New Mexico, and Texas) as of December 16, 1995. Cross-border truck services to the remainder of the United States were to start as of January 1, 2000. In addition, Mexicans were to be permitted to establish an enterprise in the United States to provide truck services for the transportation of international cargo between points in the United States as of December 17, 1995.

In February 2001, a NAFTA panel ruled that the United States moratorium on free movement of trucks between the United States and Mexico was inconsistent with the NAFTA. The decision of the NAFTA panel required the DOT to consider applications on individual merit and not to refuse authority across the board to all Mexican companies. The law of the United States considered applications for operating authority from U.S.

and Canadian carriers on an individual basis. This differential treatment of Mexicans, on the one hand, and Americans and Canadians, on the other, violated NAFTA nondiscrimination Articles 1202 (national treatment) and 1203 (most-favored-nation treatment).

The United States argued that the continuation of the moratorium was justified under the general exception of Article 2101, which provides that “nothing...in Chapter 12 (Cross-border Trade in Services)...shall be construed to prevent the adoption or enforcement by any party of measures necessary to secure compliance with laws or regulations...relating to health and safety and consumer protection.” The panel, however, ruled that the United States had to use the least-trade-restrictive means available to address its safety concerns. The numerous exceptions the United States applied to the moratorium proved that there were less restrictive means available to achieve its safety goals with respect to Mexican truckers. Thus, the blanket ban could not be justified under Article 2101.

Following the panel decision, President George W. Bush announced that he would let Mexican trucks in without delay. However, on June 26, 2001, the U.S. House of Representatives voted to block the Department of Transportation (DOT) from issuing permits that would let Mexican trucks operate throughout the United States. The Democrats were influenced by the domestic trucking lobby, which would lose business to Mexican truckers. The Republicans were influenced by the insurance lobby, which would lose business to Mexican insurance companies.⁴² On November 27, 2002, President Bush modified the moratorium, requiring the federal government to review Mexican carrier applications and grant provisional operating authority to qualified Mexican truck and bus companies.

On December 3, 2002, a coalition of environmental, labor and trucking industry groups asked a judge for an emergency stay of President Bush’s decision to open U.S. highways to trucks from Mexico. The groups claimed that the federal government did not adequately review the impact the trucks would have on air quality in the United States. This legal action was taken despite a study undertaken by DOT showing that the entry of Mexican trucks would have no significant impact on the environment. On February 9, 2003, the U.S. court of appeals for the ninth circuit required DOT to prepare full environmental impact statements under the National Environmental Policy Act (NEPA) before approving the operation of Mexican motor carriers in the United States. On June 7, 2004, the Supreme Court of the United States overturned the lower court ruling, removing this particular obstacle to resolving the trucking dispute.⁴³

In September 2007, the United States and Mexico began a cross-border trucking pilot program. The one-year pilot program allowed approved Mexican carriers beyond the 25-mile commercial zone, with a similar program allowing US trucks to travel beyond Mexico’s commercial zone. By January 2008, 57 trucks from 10 Mexican companies received permission to operate in the US and 41 trucks from four U.S. companies received permission to operate in Mexico. The data from the Department of Transportation reportedly showed that US carriers had made twice as many trips to Mexico as Mexican carriers have to the United States.⁴⁴ In August 2008, the program was extended.⁴⁵

However, in March 2009, the United States Congress ended the pilot program, citing concerns over job loss, truck safety, and border security.⁴⁶ Mexico responded by

imposing countermeasures under NAFTA against imports from the United States for the failure of the United States to comply with the NAFTA panel ruling. Mexico's countermeasures, which took the form of increased tariffs on U.S. imports, prompted U.S. legislators representing states where the Mexican tariffs are having an impact to push for an agreement to end the trucking dispute. However, the dispute remains unresolved.⁴⁷

A summary of the study by Frittelli (2010) concluded that "One truck safety statistic, 'out-of-service' rates, indicates that Mexican trucks operating in the United States are now safer than they were a decade ago. The data indicate that Mexican trucks and drivers have a comparable safety record to U.S. truckers."⁴⁸ In August 2010, Mexico increased the number of products affected by the countermeasures.⁴⁹

The Mexico-United States trucking dispute shows how industry trade groups can influence the trade policy of a government by the selective use of information and by pursuing their economic interests in a way that makes it appear they are really seeking what is in the public interest. It also demonstrates that there are many potential legal and political obstacles creating efficient cross-border transportation corridors, even with international agreements in place. The implications for the RICAM project are clear. Mesoamerican infrastructure improvements will not be as effective as they could be if leaders are not able to overcome political obstacles to regional transportation efficiency.

Connecting the Dots: Transportation, Migration and HIV/AIDS

Rapid change in the patterns of migration (both legal and illegal) has become a matter of major international concern. Mexico and Central America are major sources of illegal immigrants to the United States. Illegal immigrants from Central American countries pass through Mexico en route to the United States. While the U.S. economy benefits from this supply of labor, the illegal nature of this flow of people promotes more illegal activities, such as people smuggling and the abuse of undocumented workers' rights in both Mexico and the United States.

Since illegal immigrants are not documented, it is not possible to calculate their numbers precisely. Warren (1995) estimated that the average number of Mexicans illegally entering the United States was around 164,000 per year between 1982 and 1992.⁵⁰ More recently, between 2000 and 2009, the rate has accelerated to around 250,000 per year. The breakdown of illegal population by their countries of birth is shown in Table 5.

Table 5: Country of Birth of Unauthorized Immigrant Population (January 2009)

	Illegal Population	Percent of Total
All countries	10,750,000	100
Mexico	6,650,000	62
El Salvador	530,000	5
Guatemala	480,000	4
Honduras	320,000	3
Philippines	270,000	2
India	200,000	2
Korea	200,000	2
Ecuador	170,000	2
Brazil	150,000	1
China	120,000	1
Others	1,650,000	15

Source: Michael Hoeffer, Nancy Rytina and Bryan C. Baker. Estimates of the Unauthorized Immigrant Population Residing in the United States: January 2009. Department of Homeland Security, Washington, DC, 2010. Available at http://www.dhs.gov/xlibrary/assets/statistics/publications/ois_ill_pe_2009.pdf

There are several notable points. First, Mexico occupies the top position among the sources of illegal residents. Second, as a percentage of the population of the country of origin, El Salvador tops the list (see Table 6). Third, the fact that El Salvador, Guatemala and Honduras rank second, third and fourth as sources of illegal aliens points to the high probability that transportation corridors from Central America to Mexico will be used by illegal immigrants en route to the United States.

Table 6: Illegal population in US as a proportion of the country of origin population

Country		As a Percent of Population from the country of origin
Mexico	6,650,000	6 percent
El Salvador	530,000	9 percent
Guatemala	480,000	4 percent
Honduras	320,000	4 percent
Ecuador	170,000	1 percent

Source: Own calculations.

One aspect of the movement of people between the United States and Mexico does not get much publicity: the transmission of communicable and deadly diseases such as AIDS. With no checks and balances, many migrants (perhaps unwittingly) are helping to spread the AIDS virus (and other infectious diseases such as tuberculosis and hepatitis) on both sides of the border. In 2001, Mexico launched a program called “Go healthy, return healthy” for people who are illegally crossing the border into the United States. This program arose from a real concern: these diseases are more prevalent in the border states of both countries (Smith, 2001).⁵¹

According to the 2000 Census of the United States, 12% of Americans are of Hispanic origin and at least 65% of them are of Mexican origin. As of 2010, it is

estimated that the United States is the second largest Spanish speaking country in the world - with 43 million native Spanish speakers - second only to Mexico. The largest numbers of Hispanics of Mexican origin are found in the border states, particularly California and Texas. In the border region, different versions of Mexican culture exist on both sides of the border. Unfortunately, the Mexican culture, poverty and a relative lack of education could help facilitate the spread of AIDS into the general population, for several reasons. First, “macho” culture could prevent the use of condoms among bisexual men. They provide a key link to spread HIV/AIDS from the homosexual to the heterosexual population. Second, poor drug users with little education are likely to share needles and help the spread of HIV/AIDS. Third, there is evidence that many migrant men visit (cheaper) prostitutes on the southern side of the border. Given the culture and lack of education, there is relatively little use of condoms by the prostitutes in Mexico (see, Hendricks, 2002).⁵²

If AIDS becomes a problem for Mexico, it will also be a problem for the United States. As noted in Table 4, all of the Central American countries have higher rates of HIV/AIDS infection (0.4-2.1) than Mexico (0.3), with the exception of Nicaragua (0.2). The issue thus has the potential to affect both the implementation of existing agreements on the movement of natural persons and the negotiation of future agreements.

However, restricting the movement of people with HIV/AIDS is not a practical solution to this problem. In practice, it would be difficult to apply such a measure. Many people are unaware that they carry the virus and would rather not know if they do. Infected individuals show no outward sign of infection for several years, making it difficult to screen out infected travelers based on outward appearance. Given the sheer number of border crossings, it would be impractical to test each traveler for HIV. Testing at the border would only impede international commerce. Alternatively, the risk of cross-border HIV transmission could be reduced by requiring visa applicants to submit to an HIV test. However, those who view mandatory HIV tests as an unacceptable requirement would enter the United States illegally. Thus, mandatory HIV testing would fail to achieve the policy objectives of reducing AIDS transmission and illegal border crossings. Indeed, the United States recently reversed its policy of restricting the entry of HIV positive individuals.

The link between Mesoamerican transportation routes, illegal immigration and HIV/AIDS transmission suggests that illegal immigrants are another at risk population that should form part of the RICAM HIV/AIDS strategy that we proposed in the previous section.

High Finance: The Drug Trade and Economic Development

An issue that requires further study is whether the drug trade and associated violence in northern Mexico is causing deindustrialization, as factories close and move elsewhere. However, there is insufficient data to determine the accuracy of anecdotal evidence that drug violence in northern Mexico is causing factories to close. Factory closing could be due to other factors, including the economic crisis in the United States (Mexico’s main export market) and the associated economic impact in Mexico (particularly in the export sector).

There is some evidence that the population has declined in border cities such as Ciudad Juarez, where violence related to drug trafficking activities has increased in recent years. However, there is also evidence of population decline in cities such as Detroit, which are not experiencing the degree of drug-related violence that has occurred in Ciudad Juarez. Unemployment has also increased in northern Mexico. However, it has also increased in many parts of the United States.

The relocation of some industries, such as clothing and textiles, also might be explained by the increase of the relative attractiveness of other manufacturing locations due to trade liberalization. For example, the WTO Agreement on Textiles and Clothing has made several Asian countries more attractive than Mexico as a manufacturing base for exports to the United States and other markets, by eliminating the preferential access that Mexico enjoyed under the NAFTA.

Conclusion

By the end of 2009, nearly eighty percent of the transport projects were either completed or under construction. It is hoped that the RICAM project will stimulate trade and economic growth in the Mesoamerican region. However, it is too early to predict the results, since the project is not yet completed.

There are two lessons for the RICAM project that may be drawn from the problems encountered in other trade-related transportation settings. First, such projects need to be accompanied by complementary programs to mitigate unintended consequences that might undermine the development objectives of Aid for Trade: the spread of HIV/AIDS via trucking routes, prostitution and illegal immigration. At the planning stage, projects for Aid for Trade infrastructure must consider strategies for mitigating these unintended consequences that could produce the opposite development effect to that intended. Second, associated policies must be coherent with the objectives of the Aid for Trade infrastructure project. In the case of RICAM, these associated policies are the resolution of the Mexico-United States trucking dispute and the harmonization of trucking standards in the NAFTA region. In this case trade donors, HIV/AIDS donors and other relevant stakeholders should consult and share insights in order to develop coherent and complementary strategies. Aid for Trade and the other Millennium Development Goals can and should be mutually supportive.

Our analysis indicates that the RICAM project needs to incorporate a plan to mitigate the risk that increased trade and improved transportation infrastructure will undermine development, poverty reduction and other development objectives of the Millennium Development Goals by facilitating the spread of HIV/AIDS in the region. While the RICAM project has made progress in improving the trade-related transportation infrastructure in the region, an effective HIV/AIDS strategy will be an important factor for the long-term success of this Aid for Trade project. This strategy needs to focus on at risk populations: truckers, prostitutes, men who have sex with men and illegal immigrants.

In addition, the goal of RICAM is to help developing countries to build trade-related infrastructure, in order to facilitate access to markets and increase exports, and to assist regional integration. However, the most important export market for the region is the United States. To maximize the effectiveness of the RICAM project, the trucking

dispute between Mexico and the United States needs to be resolved in order to lower the cost of transporting goods to market.

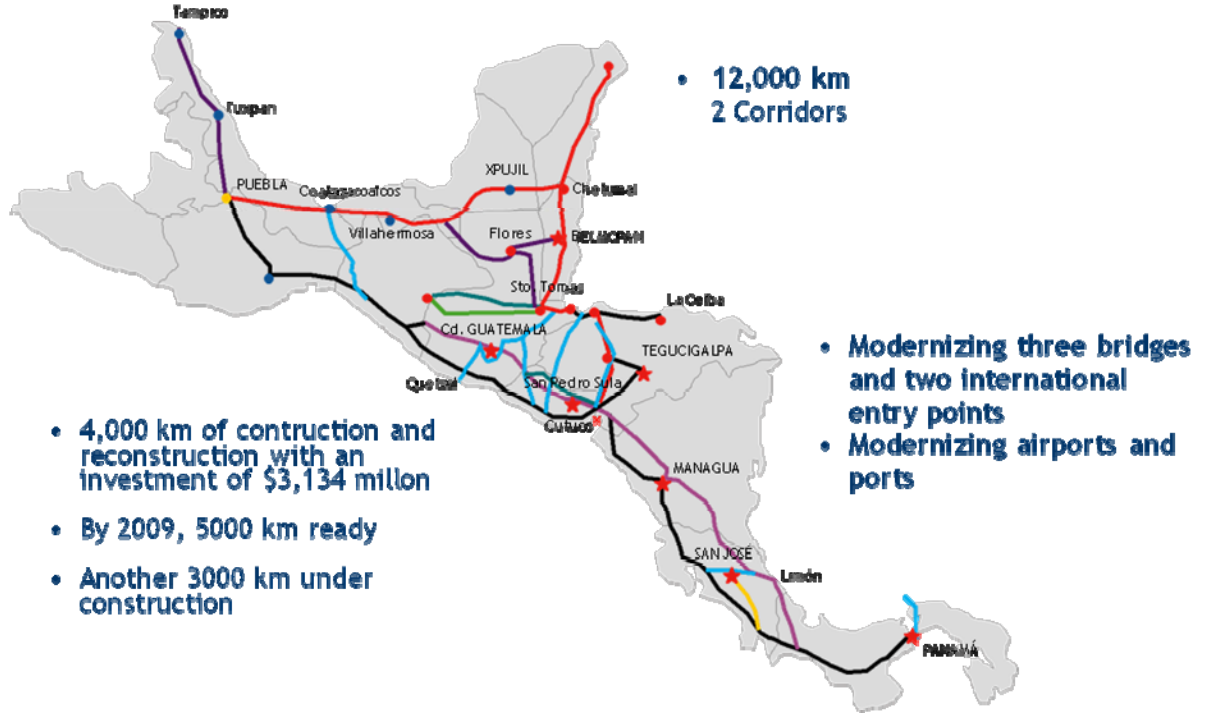
An issue that requires further study is the potential relationship between the illegal drug trade, trade-related transportation infrastructure and economic development in the region.

The program we are suggesting has applicability for infrastructure projects for other countries financed by international organizations. For example, if the World Bank wants to fund a highway project in a developing country, it should take into account the possible unintended effect of the project on infectious diseases like HIV that tend to propagate with the expansion of road transport. Through proper education and management, plant diseases can also be reduced to a minimum, as Australia has shown with banana cultivation. Finally, it is important to ensure that other policies complement Aid for Trade infrastructure projects. In the case of RICAM, this means resolving the Mexico-United States trucking dispute in order to ensure more efficient transportation of goods and people between Mesoamerica and the largest market in the region.

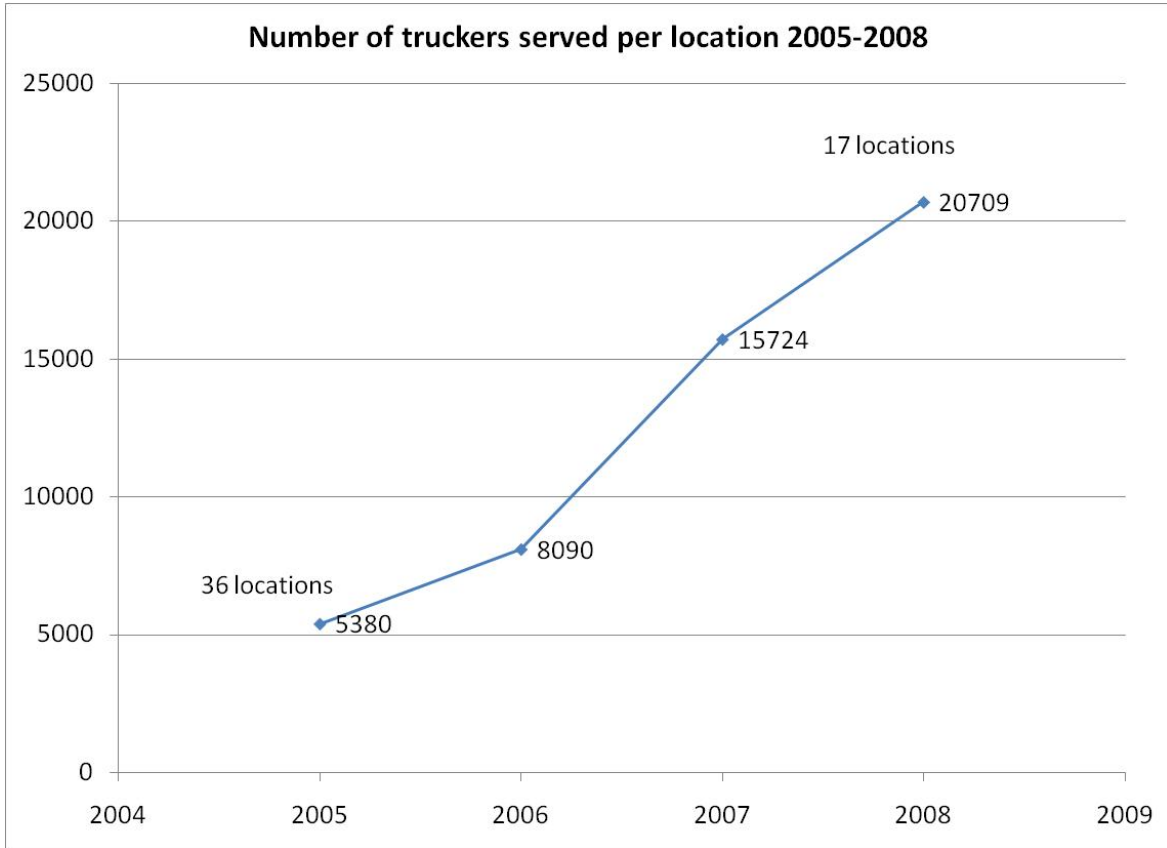
Appendices and References

Appendix 1: RICAM Project

HIGHWAY NETWORK MESOAMERICAN RICAM

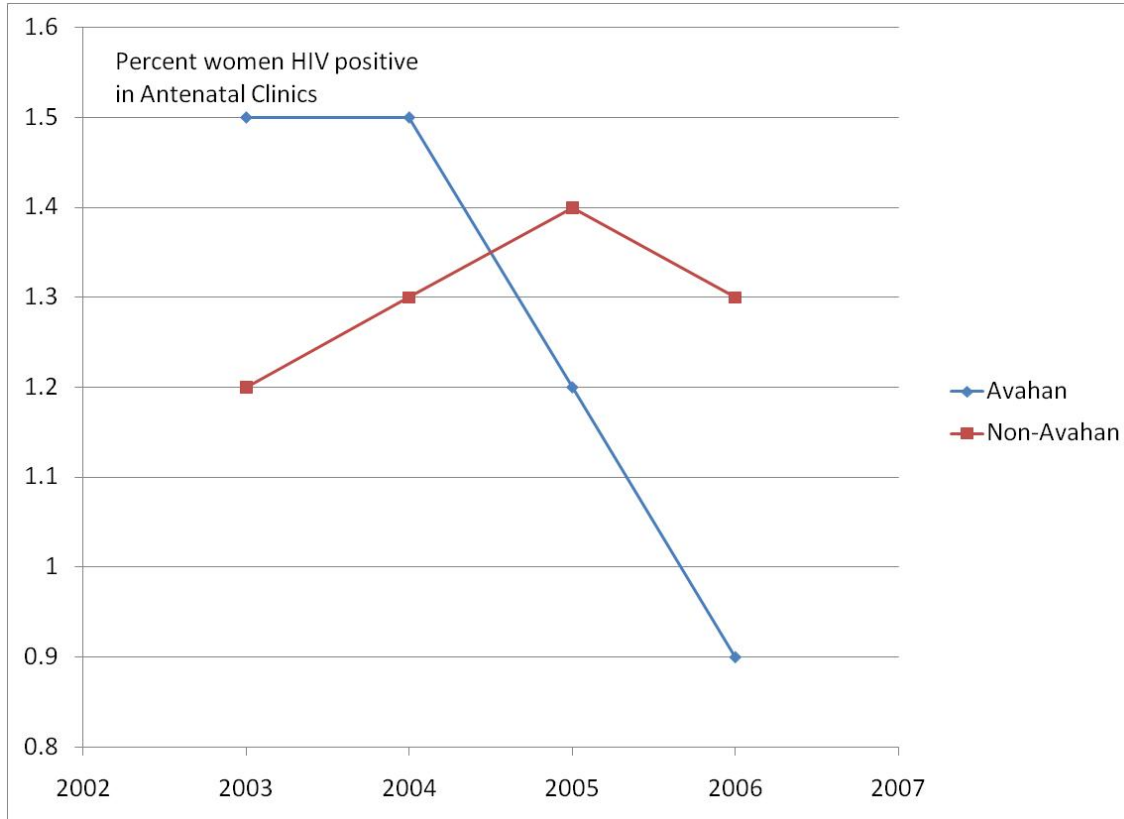


Appendix 2 : When Less is More



Data source: Gates Foundation Website

Appendix 3 : Avahan makes a difference



Data source: Gates Foundation Website

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⁷ Ibid.

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