

The Mexican Landbridge Project: The Isthmus of Tehuantepec and Inter-Oceanic Transit

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In 1975 the Mexican government announced plans for a Mex\$ 10 billion double-tracked, electrified, high-speed rail corridor across the Isthmus of Tehuantepec (Treiman 1975). The new line was the central part of a trans-isthmian link between the Atlantic and Pacific oceans that was intended to be an alternative to the Panama Canal. Shelved temporarily because of economic problems in 1977, the proposal was revived in 1979 but without the rail corridor (Weston 1979a, 25). Referred to now as the Mexican Landbridge Project (*El Puente Terrestre Mexicano*), but originally code-named "Alpha-Omega," the plan involved the creation of container facilities at Coatzacoalcos and Salina Cruz and the upgrading of the already existent rail line across the isthmus between the two ports (Weston 1979b, II; Fig. I). It became a priority during the last years of the López Portillo administration and was completed in 1982 after an estimated expenditure of Mex\$ 110 million (Orme 1984a). The Mexican Landbridge project represented a unique approach to trans-isthmian commerce, and Mexico had high expectations for its success. Today, however, the berths most frequently are empty, the cranes little used, and the yards hold few if any containers.

The Mexican Landbridge Project was not the first attempt to use the Isthmus of Tehuantepec as an inter-oceanic link. In fact, such a role for the isthmus had been considered some 450 years earlier, but the intervening centuries saw many disappointments. One wonders whether the current project is only the latest in that series of failures. This paper discusses the historic role of the Isthmus of Tehuantepec as a link between the two oceans, looks especially at the current status of the Mexican Landbridge, and attempts to determine whether it has been or will be a success.

COLONIAL DEVELOPMENTS

After his conquest of the Aztecs, Hernán Cortés began searching for a natural water passage to the Pacific. Despite his failure to discover such a strait, Cortés did show an interest in the Isthmus of Tehuantepec area and its potential for Pacific commerce, and he was able to incorporate the region into his landed estates (Madariaga 1942, 465). Although Cortés did develop some form of road across the isthmus for Indian porters before 1527, he apparently did not advocate the construction of an inter-oceanic canal (Friberg 1968, 51-52; Moorhead 1949). Such an idea did not appear, it seems, until 1554 when Francisco López de Gómara recommended four potential sites for a trans-isthmian canal: Darién and the Río Chagres in present-day Panamá, the Río San Juan in present-day Nicaragua, and the Isthmus of Tehuantepec (Glick 1959, 2). Nothing, however, came of these plans.

During the colonial period, a route across the isthmus was used intermittently to transfer large, bulky items between the Pacific and Atlantic coasts. It apparently was the same as that developed by Cortés. A road led across the sierra from the town of Tehuantepec on the Pacific side to a landing on the Río Coatzacoalcos considerably upriver from Minatitlán; goods then were transported by river to the Gulf. About 1774, however, the Viceroy of New Spain, Antonio María de Bucareli, ordered Agustín Cramer to survey the isthmus for an inter-oceanic waterway. Cramer reported the feasibility of an 188-mile long canal through the mountains that would connect the headwaters of rivers flowing northward toward the Gulf of Mexico and southward to the Pacific (Covarrubias 1954, 164). Alexander von Humboldt, visiting the New World in the early 1800s, offered qualified support for this idea. He recommended five potential locations for an inter-oceanic canal, and among them was the Isthmus of Tehuantepec (Humboldt 1826, 241-42). He felt, however, that the width of the isthmus and its winding rivers would create "obstacles to the project of opening a canal of sea navigation" and advocated [end p. 12] that a canal for small craft or an improved road be built instead (Humboldt 1826, 244-45). The Spanish government also doubted that Tehuantepec was the best location for a canal and decided that the Río San Juan in present-day Nicaragua should be the site for such a project. Before any work could commence however, the wars for independence began, and a trans-isthmian canal became the responsibility of the new republics of Latin America and of the United States (Ealy 1971, 9).

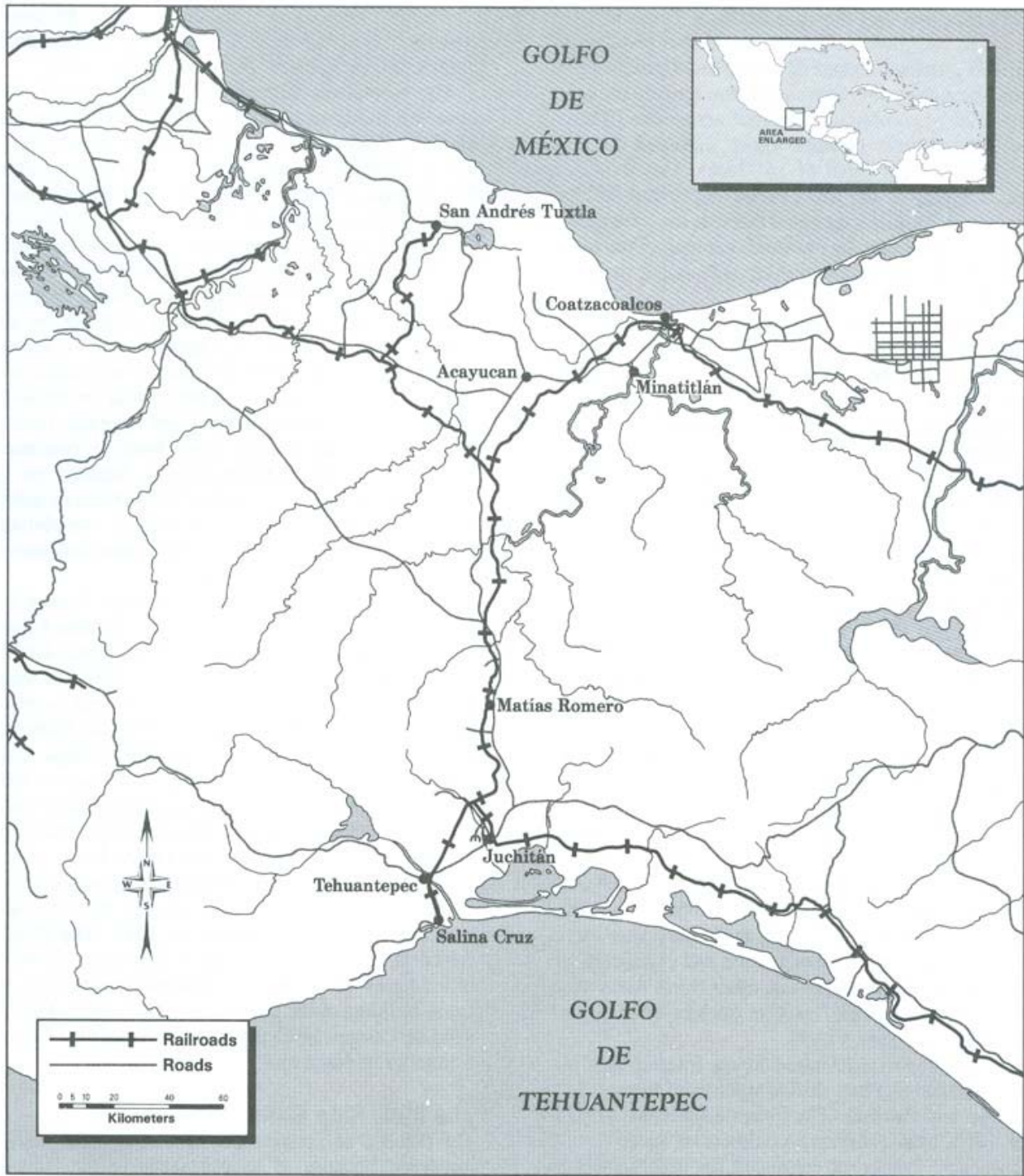


Fig. 1. The Isthmus of Tehuantepec, showing current railroad and highway routes. (Source: "Mexico Istmo: Carta Turística," Instituto Nacional de Estadística, Geografía e Informática.)

Nineteenth- Century Developments

In the early nineteenth century, the United States preferred Panama for the location of an inter- [end p. 13] oceanic canal, but the annexation of Texas in 1845 focused attention on Mexico as another possibility. In 1842 Antonio López de Santa-Anna had awarded José de Garay the concession for a road, railway, or canal or combination thereof across the Isthmus of Tehuantepec. Gaetano Moro surveyed the area and proposed a canal of 161 locks. He advocated the dredging of the Río Coatzacoalcos and the digging of a 50-mile long canal through the mountains. Lack of funds and the eventual outbreak of the Mexican-American war, however, terminated the project (Glick 1959,7-10).

Negotiations over the Treaty of Guadalupe Hidalgo to end the war in 1848 reflected a growing United States interest in the Isthmus of Tehuantepec. The U.S. negotiator, Nicholas Trist, was authorized to double the payments to Mexico (an additional \$15 million) to win transit rights across the isthmus for the United States (Glick 1959, 12). Trist failed in this attempt, but representatives from the United States and Mexico agreed in 1850 to a tentative treaty guaranteeing such passage. The United States, however, wanted another provision: the right to intervene militarily of its own accord and not just at the request of the Mexican government (Fernández MacGregor 1954, 33). Realizing the potential problems, Garay sold his concession to English investors, who in turn transferred it to an American company. Antagonism toward North Americans holding a Mexican concession so soon after the Mexican-American War; fear that the United States, which already had expressed an interest in annexing the isthmus, would take more national territory; and outrage over American treaty demands brought the Mexican Senate to declare the Garay concession null and void in 1851. This action also invalidated the claims of those individuals who later had acquired the concession and expelled from the country all surveyors and other North Americans who were working on the project (Fernández MacGregor 1954, 41-45).

By then, official United States interest in a potential canal site had shifted southward toward Nicaragua and Panama. The Panama Railroad, opened in 1855, was achieving commercial success, and Cornelius Vanderbilt continued his involvement in the transportation route across Nicaragua. But many individuals still considered the Isthmus of Tehuantepec a valuable gateway with potential for development. In 1857 the Louisiana Tehuantepec Company, again with North American interests, acquired the Tehuantepec concession. The company succeeded a group of investors who had won a contract with the Mexican government in 1853 to develop a trans-isthmian route by using the Río Coatzacoalcos as far upriver as possible and then building a railroad where the river no longer was navigable. They, however, had realized no construction, nor had they fulfilled any of the other contractual obligations (Zaremba 1881, 4349).

The Louisiana Tehuantepec Company did not have the funds to build a railroad but it did open a highway. The company began trans-isthmian service in 1858 on a route between New Orleans and San Francisco that competed with the already successful Panama Railroad (Glick 1959, 25-26). Advertisements painted a pleasant picture of the route across Tehuantepec and emphasized that it was situated in a higher latitude than its equatorial Panama rival, but one traveler referred to such claims as "propaganda to attract the unsuspecting" (Covarrubias 1954, 168). The trip involved a steamer arriving from New Orleans at Minatitlán on the Río Coatzacoalcos. Those making the journey transferred to a shallow-draft river boat to continue upriver to Suchil, whence horses, bearers, or a coach carried them overland to Salina Cruz to meet a steamer to San Francisco. Travelers' complaints were legion, and the route offered little real competition to the Panama Railroad.

After the North American Civil War, interest in a trans-isthmian canal revived, and President Ulysses S. Grant appointed an Isthmian Canal Commission in 1872. Admiral R. W. Shufeldt had surveyed Tehuantepec anew in 1870 and recommended that a canal be built across the isthmus instead of in Nicaragua or Panama for strategic reasons. He concluded "that a ship canal across the Isthmus of Tehuantepec is not only practicable, but also that the topography of the country presents no extraordinary obstacles to its construction" (Stevens 1871, 40). Despite Shufeldt's optimism, the Isthmian Canal Commission selected the Río San Juan route through Nicaragua in 1876. The Rutherford B. Hayes administration, however, showed little interest in a canal, and the earliest attempts at canal building were by private companies and de Lesseps in Panama and the Maritime Canal Company in Nicaragua.

The Eads Ship Railway

The Isthmus of Tehuantepec remained strategically important because of its proximity to the United States and the Gulf; "it was but eight or nine hundred miles from the mouth of the Mississippi to the Atlantic side of that transit, and "the isthmus" . . . was in the Gulf of Mexico, which could be converted into an American lake whenever the United States thought proper" (U.S. House 1881b, 82). But the cost of a canal with some 120 locks across the 740-foot mountains was prohibitive. James B. Eads, however, offered another solution to the question of using Tehuantepec and advocated the construction of a ship railway to carry ocean- **[end p.14]** going vessels overland between the Atlantic and the Pacific oceans. He received what was considered a very generous concession from the Mexican government in 1880 (Captain Eads' Ship Railway 1881, 4296).

The Eads plan envisioned a six-track railway (twelve rails placed 4 to 5 feet apart) built across the isthmus to carry ships of up to 6,000 tons gross weight. A vessel would be maneuvered into a specially constructed narrow basin at either port, and various supports along the keel and along the sides of the ship, including rams under hydraulic pressure and steel girders, would stabilize it in a wheeled cradle (Figure 2). The cradle would be towed out of the water along a partially submerged inclined railway by stationary engines; two powerful locomotives then would be attached to it. They would pull the cradle and the ship at 10 to 12 miles per hour across the isthmus. The route was to follow a gentle grade of no more than one percent with very broad curves and make use of large turntables to accommodate turns (Tehuantepec Railway 1884, 12-25; Mr. Eads' Ship Railway ... 1880, 308-9). An engineering firm agreed "that they would lift ... loaded ships of from 8,000 to 10,000 tons weight on a railway car and place them on the permanent way in thirty minutes . . . and . . . guarantee the safe

transportation of the loaded ships over the railway" (Tehuantepec Railway 1884, 27). Eads sought support from the U. S. Congress in 1880-1881 and testified a number of times before various committees; he received a generally favorable hearing, and one committee even recommended limited financial support (U. S. House 1881a). Eads' s project constituted another option in the canal debate, but his death in 1887 brought an end to any serious consideration of a ship railway at that time.

Tehuantepec National Railway

During the 1880s and early 1890s, a series of railway concessions eventuated in some construction of a trans-isthmian railroad. The Tehuantepec National Railway was completed finally in 1894, but it was unfit for service (Glick 1953, 373). S. Pearson and Son of London rehabilitated the line and constructed port facilities at Coatzacoalcos and Salina Cruz, and the railroad opened officially in 1907. A contract with the Hawaiian-American Steamship Company provided 250,000 to 300,000 tons of sugar a year to be shipped from the Pacific to the Gulf Coast, a transfer that required only a half day. The railroad carried more than 350,000 tons of interoceanic freight in 1908, and this traffic increased to more than 850,000 tons in 1913, more than double that handled in 1908 (Glick 1953, 374-81). After years of survey, planning, and building, the Isthmus of Tehuantepec seemingly had realized finally the role envisioned for it almost four centuries earlier. But the beginning of World War I saw a decline in world commerce, and the opening of the Panama Canal at the end of 1914 sealed the Tehuantepec Railway's doom. Traffic plummeted to less than 9,000 tons of inter-oceanic freight in 1915 and less than 500 in 1918.

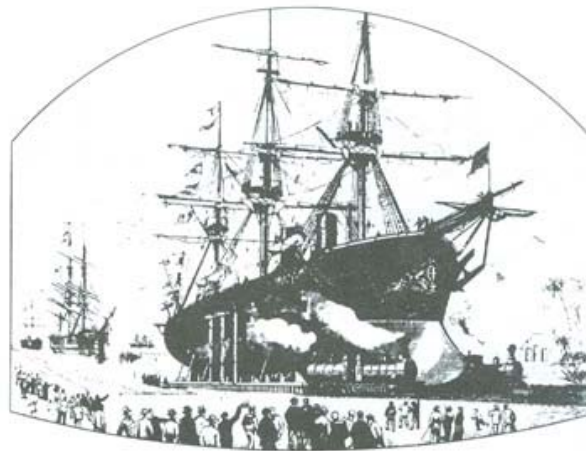


Fig. 2. Artist's rendering of proposed Eads's Ship Railway. (Source: cover page, *Scientific American* 48(20), November 13, 1880.)

TWENTIETH-CENTURY DEVELOPMENTS

Despite this reverse, the Isthmus of Tehuantepec continued to be considered for some form of inter-oceanic transit. Many still held the opinion expressed by one individual in the late nineteenth century: "The financial necessities of trade seeking the shortest, quickest and cheapest routes of transportation, will concentrate such an accumulated pressure upon both sides of the Tehuantepec isthmus . . . as to pierce it with a ship 'canal'" (Wilson 1884, 10). The Isthmus of Tehuantepec still was 1500 miles closer than Panama to the United States and was located on "the Gulf of Mexico, the Mediterranean of America, [which] is situated precisely where it can best answer the demands of American commerce" (Stevens 1871, 23).

In the late 1940s, the Mexican government expressed interest in building a canal; but the high cost, estimated at \$13.6 billion, and problems of insufficient stream flow to operate the locks made it impractical (Ortiz Wadgyr 1971, 75-76). The Mexican engineer Modesto Rolland, however, revived James Eads's proposal for a ship railway but on a much grander scale. He envisioned vessels of up to 15,000 tons being carried across the isthmus in huge boxes. Initially, he suggested that these would be large mobile dry docks but later argued that they be closed and filled with water so that the ships could float in them. Each box would be supported by hundreds of railway trucks, with their own [end p.15] individual and independent electric motors, and run on ten parallel tracks. At one or the other port, the box would be submerged like a drydock into which the ship entered, and the box, once its end doors were closed, would be moved onto dry land. The self-propelled boxes would travel across the isthmus at 40 miles per hour, and sidings would allow movement in both directions; the whole transit would be made in 9 to 10 hours (Figure 3). Rolland estimated that the railway could handle some 4 million tons annually, about 13 percent of what then was passing through the Panama Canal, and be built at a cost that was a small fraction of that required for a waterway (Rolland 1946; 1949). Despite the many calculations and technical illustrations, the ship railway never got beyond the drawing boards. In 1968 the Mexican government expressed anew its interest in building

a canal across the Tehuantepec isthmus, but at the same time another idea was broached that involved the development of a system to transfer containers from port to port by railroad (Ortíz Wadgymar 1971. 77-78). It was a concept that soon took hold as the basic theme of the Mexican Landbridge Project.

The Mexican Landbridge Project

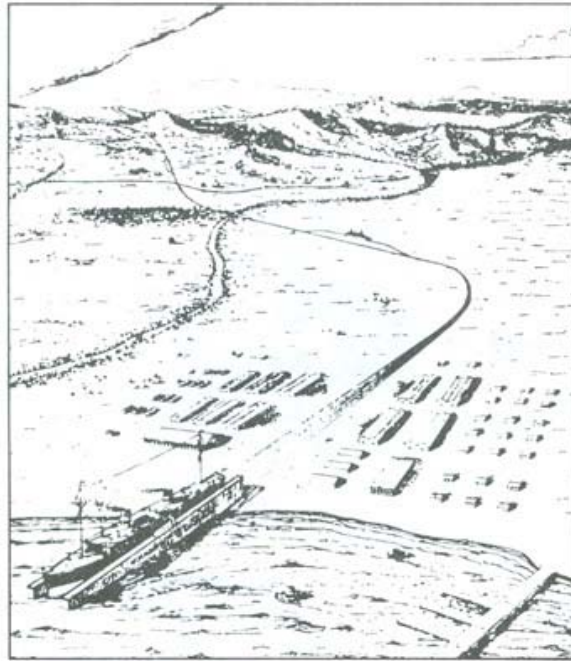


Fig. 3. Artist's rendering of proposed overland ship transportation system. (Source: Rolland 1946, 3.)



Fig. 4. Container yard complex, Coatzacoalcos, Veracruz, August 1985 (photo by author).

Mexico's hopes for the success of its Landbridge across the Isthmus of Tehuantepec were tied to two developments. First was the growing importance of container traffic in world shipping. Between 1970 and 1982, when the Landbridge opened, the volume of world container traffic increased five-fold, from 47 million to 280 million tons, and predictions anticipated another doubling to 411 million tons in 1990 (Containerization in the Developing World 1986. 28). Already, some 85

percent of the cargo carried by ships was containerized, and the potential of container traffic was enormous (Branch 1982, 116). The second development involved problems with the Panama Canal. By the 1970s more than 15,000 ships, carrying more than 200,000,000 tons of freight, were negotiating that waterway each year (McCullough 1977, 612). Such pressures created congestion and long delays for vessels awaiting passage; furthermore, hundreds of ships were too large even to pass through the canal. The Mexican government was confident, therefore, that the Landbridge would win over some of this traffic by offering efficient facilities for the rapid transfer of containers. Initial expectations were that some 7 percent of the canal's traffic could be diverted.

During its first two years of operation, the Mexican Landbridge almost exclusively handled domestic freight, but it still sought to become a major inter-oceanic link (Orme 1984b). facilities at the two ports were new; each had a 900-foot container berth with a 39-foot depth served by a 30.5 ton capacity crane, and the container yards each covered approximately 17 acres with room for 2,750 units (Figure 4). Containers could be carried across the isthmus along the two-lane highway by truck in 6 hours or on the single-track railroad in 12 hours (Mexico's Landbridge 1984a). The Landbridge was expected to transfer some 10,000 to 20,000 containers in its first full year of operation, and this traffic would increase to 40,000 containers annually. The addition of more cranes and the expansion of port facilities were to raise that to 200,000 containers after some five or so years of operation (Orme 1994a). In 1984 the Mexican shipping line, *Transportación Marítima Mexicana* (TMM), began offering through service from Western Europe to the United States Pacific coast and to Asia via the Isthmus of Tehuantepec, and other companies were considering their own use of the trans-isthmian route. [end p. 16]

The Landbridge thus seemed to be realizing its role "as a major Mexican contribution to international shipping" (Mongelluzzo 1984, 16). In 1983 only 199 containers had been carried across the isthmus in inter-oceanic commerce, but in 1984 the Mexican Landbridge handled 4,466 containers, representing some 61 percent of all containers handled at the two ports (Conde García, pers. comm. 1986; Dirección General 1985, 21). Some 95 percent of the containers moved from Coatzacoalcos to Salina Cruz, and total monthly traffic averaged almost 400 units. More than 600 containers crossed the isthmus in April, August, and October, but even this constituted a rate far below the 10,000 to 20,000 units anticipated for the first full year of operation. In spring 1985, traffic fell off precipitously, and only 1,766 containers were handled during all of 1985. In the first three months of 1986, just 222 containers were carried across the isthmus. The Mexican Landbridge Project, therefore, despite optimistic predictions and a marginally good performance in 1984, was not living up to its expectations.

This lack of success has resulted from a number of problems that the Landbridge has faced. Although supported heavily by the López Portillo government as a means of encouraging development in the region, the project has received virtually no funding from the current de la Madrid administration (Mexican Land Canal 1984b). The major upgrading and rebuilding of the railroad, which constituted an integral part of the original proposal, were cancelled, but there also has been a shortage of funds to coordinate ships, transport, and transfer facilities at the two ports to insure the rapid movement of containers. Despite the capacity of the Mexican Landbridge to compete successfully in terms of time with the Panama Canal for freight across the isthmus, the project has failed to entice major shipping companies, other than the Mexican line, TMM, to use the service (Conde García, pers. comm. 1986). The initiation of the project in the early 1980s, a time of world recession and deteriorating international trade, was inopportune, and the decreasing congestion at the Panama Canal because of improvements in its operation, decline in world commerce and in the number of ships using the waterway, completion of the oil pipeline across Panama, and competition from the multi-modal, railroad-oriented U. S. mini-bridge system lessened the Mexican Landbridge's potential. A report published in early 1986, for instance, reported fewer than 12,000 ships using the Panama Canal and concluded that "the Canal is in excellent operating condition, [and] transit capacity exceeds demand ... " (Manfredo 1986,38).

CONCLUSION

The Isthmus of Tehuantepec long has played a role in the development of trans-isthmian commerce, but it thus far has been an unsuccessful one. Considered for centuries as a potential inter-oceanic link, either by waterway or surface transportation, it lost out finally to Panama as a canal site. But the Mexican Landbridge Project has the greatest potential of any of the plans that have been put forth to use the Isthmus of Tehuantepec. The role of containerization in world commerce and the constant improvement in its multi-modal technology make the Landbridge concept a very contemporary and very feasible idea. Its potential to compete with the U.S. mini-bridge system and with the Panama Canal is considerable, even now, in regard both to time and expense; and the Landbridge offers an increased degree of flexibility for trans-isthmian shipments. For instance, like a freight train in a sorting yard, a shipload of containers could be directed to many different destinations either before or after they were shipped across the isthmus. But the reality of a struggling economy, a U\$100 billion debt, and many other spending priorities make it impossible for Mexico to invest the funds necessary for the project's success. As a result, the Mexican Landbridge, despite great promise, is but one more unrealized project in the long history of plans intended to make the isthmus an inter-oceanic link.

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