# Infrastructure projects: canals and waterways

## Part 17
## Ibero-American integration

Infrastructure is not an industry that produces wealth directly, but it "produces" something more important: productivity. To become an economic superpower, Ibero-America will need 200,000 kilometers of new railroads, as well as ports, canals, hydraulic projects, nuclear energy, and a second inter-oceanic canal.


This installment continues Chapter 6 of our exclusive English-language serialization of the Schiller Institute's book, *Ibero-American Integration: 100 Million New Jobs by the Year 2000!* The book was published last September in Spanish. It was prepared by an international team of experts elaborating Lyndon LaRouche's proposal to free the continent of economic dependency and spark a worldwide economic recovery, "Operation Juárez."

Numbering of the figures, tables, and maps follows that of the book.

Ibero-America makes only very limited use of waterborne transport. Nearly the only countries that do so are Brazil and Argentina. What is urgently needed to achieve the physical integration of Ibero-America is the linkage of the Orinoco, Amazon, and La Plata river systems, through which a single, navigable inland water route could be created which would directly connect all the South American nations, with the sole exception of Chile.

As with the Pan-American Railroad proposal, this idea has a long republican tradition.

In 1799, Alexander von Humboldt stood at the mouth of the Casiquiare River, where the river divides and flows into both the Orinoco and Amazon basins, and identified the importance of this linking of the two water systems. Humboldt envisioned an inland and oceanic navigation system much as represented in **Map 6-2,** extending from the U.S.-Canadian Great Lakes, down the Mississippi River to the Gulf of Mexico, across the Caribbean, up the Orinoco and through the Amazon system to the La Plata river system.

The Orinoco-Amazon-La Plata river connections have been proven technically feasible in recent years, and engineering studies go back to 1840. Creating such an integrated inland navigation axis will actually be less difficult than that undertaken in most canals already built in the United States.

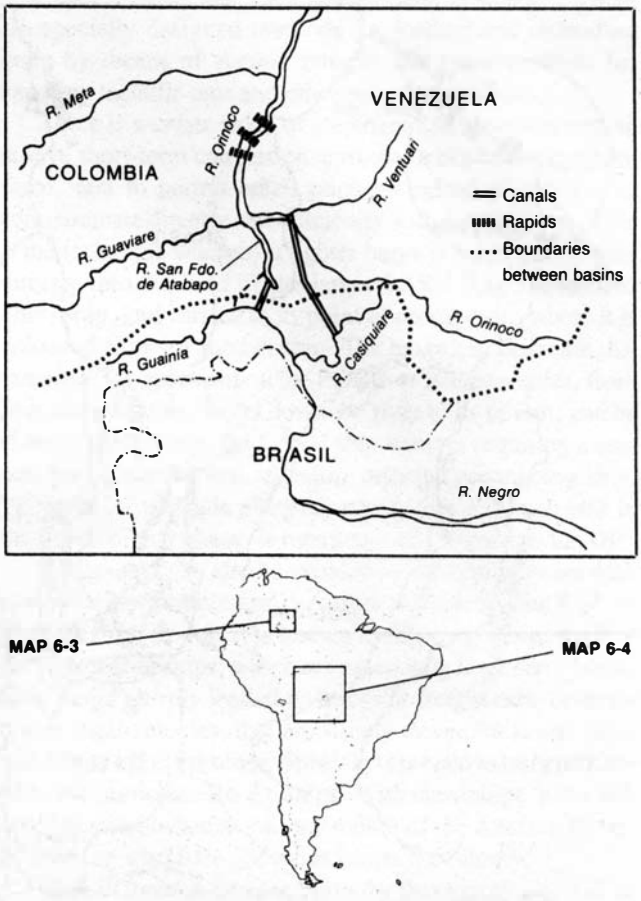
In fact, most of the South American portion of the system is composed of already navigable rivers. Out of a total direct route of 10,000 kilometers (Ciudad Guayana, Venezuela to Buenos Aires, Argentina), 6,800 kilometers, or 68%, are already navigable for ships or barges up to 6 meters draft. Another 28%, or 2,839 kilometers, requires relatively small

MAP 6-2

**Integration of the Orinoco, Amazon, and Rio de La Plata basins**


MAP 6-3

**Integration projects in the Orinoco and Amazon basins**




hydraulic works, such as minor dredging and channel widening and deepening, to be made similarly navigable. The problems of significance which merit our attention arise along a stretch of only a few hundred kilometers, where major infrastructural projects will be required to make the entire system navigable. The four main obstacles are:

**1)** On the Orinoco River, in the Puerto Ayacucho region on the Venezuela-Colombia border, there are a series of rapids that have to be overcome for an extension of approximately 60 kilometers (see **Map 6-3**). Several projects have already been proposed for the rapids, that will also utilize its hydroelectric potential (1,300 megawatts for one dam), and regulate the flow of the waters of the Orinoco River upstream above the rapids. The dams would have a system of locks, making river transportation feasible. On top of these benefits, this project will help open up the entire "Llanos" area of Colombia and Venezuela to agriculture.

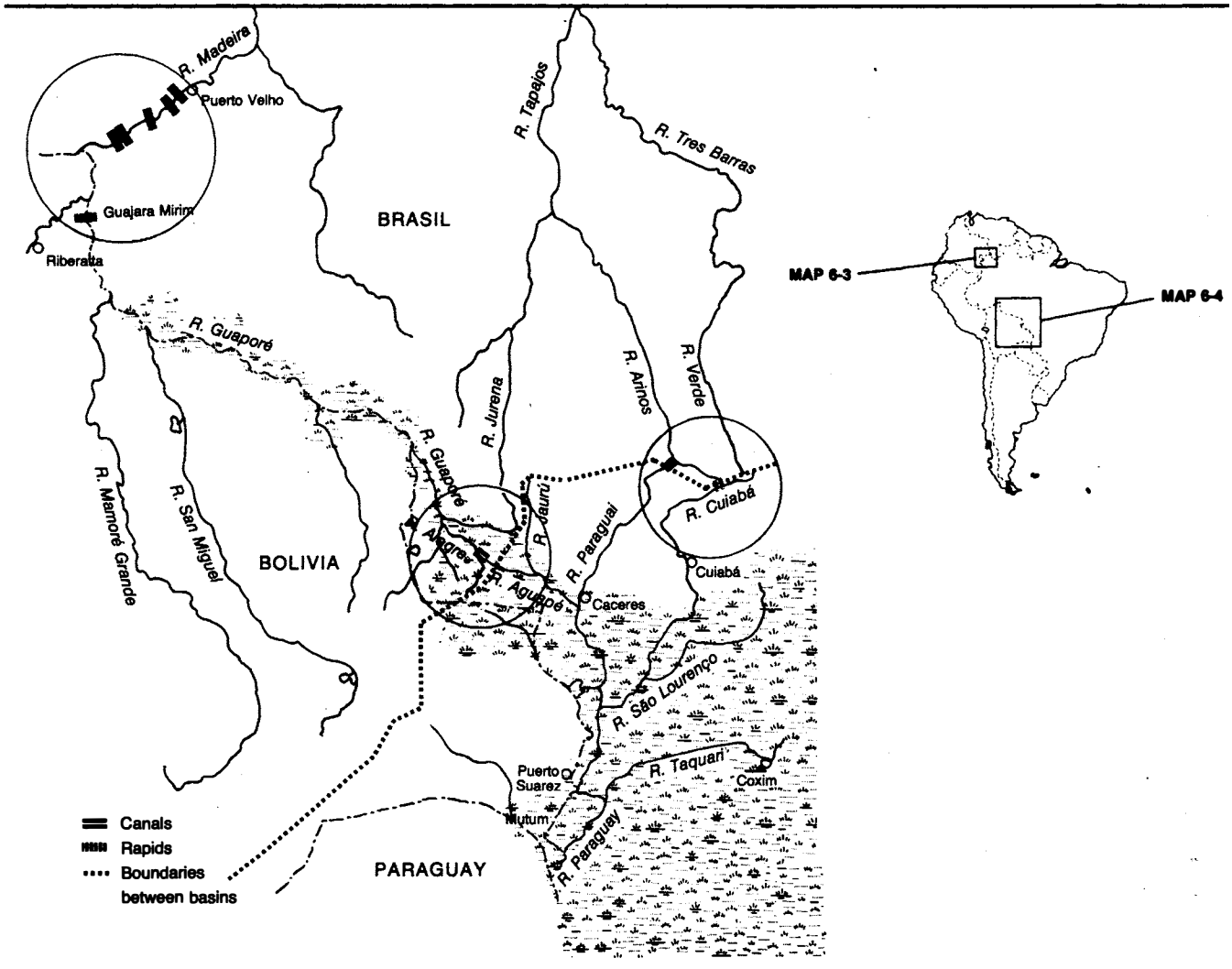
**2)** A canal must be constructed to link the Orinoco with the Amazon systems at Casiquiare (see Map 6-3). Once the two rivers which it is determined will make the best junction point are selected, a series of dams are constructed on the tributary with the lower elevation, creating a series of lakes, and locks are installed to elevate ships from one lake to the next. Some dredging is often necessary as well. As the tributary becomes smaller and smaller, the point comes at which a channel must be dug across the divide to the other river. This requires nothing more than standard channel-building techniques. Several alternative sites have been studied, including:

- Utilize the lowlands west of the Casiquiare River and the watercourses that run into the Guainia and Negro rivers, for the construction of a canal to be dug from the "Alto Orinoco," near the mouth of the Ventuari River. This canal would have a length of about 120 kilometers and end at the Casiquiare River. There would still be several rapids to deal with at both ends of the canal, however.
- A shorter canal could also be built to connect the San Fernando de Atabapo River to the Guainia River, which runs into the Negro River. Since the canal would run through level ground, mostly in swamps, this is a most feasible project.

**3)** The Madeira River (an Amazon tributary) is interrupted in Brazil between Porto Velho and Guajara Mirim by 22

MAP 6-4

## Integration projects in the Amazon and Rio de La Plata basins




sets of rapids along a distance of 483 kilometers (see **Map 6-4**). As far back as 1846, the Bolivian engineer José Augusto Palacios prepared a study of the rapids with the required canals, locks, and removal of rocks to make the river fully navigable.

**4)** There are two main options for connection the Amazon and La Plata basins (Map 6-4). The first, and best known, can be built in Brazil between the Guapore and Paraguay rivers through their respective tributaries, the rivers Alegre and Aguape. This connection, of about 30 kilometers, is preferred because of the presence of Lake Rebeca and the surrounding swamps, which reach the Paraguay River.

The second possibility is at the eastern extreme of Brazil's Serra Dos Parecis and can be done through the swamps which give birth to the rivers Arinos and Cuiaba, which flow toward the Amazon and La Plata, respectively.

In addition to the 10,000-kilometer north-south route which will be opened up by connecting the Orinoco, Amazon, and La Plata basins as indicated, there is a total of about 100,000 kilometers of navigable rivers and tributaries which can be easily connected to this basic system.

It is worth mentioning the several specific regions which will be opened up by this project. First, it is known that in Mutum, near the border with Brazil, Bolivia contains a vast iron ore and manganese deposit, possibly the largest and of the highest purity in the world. Some of the deposit extends into Brazil. Making the Parana fully navigable from Mutum south will permit the economic shipment of this iron ore to steel mills to be situated at many places along that waterway. With the connection to the Guapore, some iron can also be shipped out north. Moreover, there are believed to be large-scale alluvial, easily mined deposits of other minerals to the north of Mutum, which, if the Guapore connection is constructed, can be economically shipped south as well.

Second, the Peruvian jungle fringe region is suitable for major agricultural development, but economical transport must utilize the Amazon river system via the Ucayali. Rice, forestry products, some mining products, and probably vast quantities of petroleum, are only some of the products that would be shipped out by this route. With the interconnections indicated, these could move not only through the mouth of the Amazon, but directly to Venezuela, Colombia, Bolivia, Paraguay, or Argentina, greatly expanding its market. As the region develops, and industry also locates there (there will be very plentiful, low-cost hydropower as soon as some of the rivers are harnessed on the eastern slopes of the Andes), these waterway connections will grow in importance, as two-way arteries.

## Ports, shipping and the inter-oceanic canal

Ibero-America will build new railroads and waterways to handle the expanded transportation requirements of the Common Market, but if it doesn't also dramatically upgrade its ports and general cargo-handling capabilities, the antiquated and inefficient system of most major ports in Ibero-America will prove a dangerous bottleneck to economic growth. Similarly, given the expected sharp rise in intraregional trade in particular, the entire structure of Ibero-America's shipping fleet must be revamped, and the urgent task of constructing a new inter-oceanic canal finally begun.

Thus, there are three areas which any shipping policy must address: port capacity and methods of cargo handling; the size and type of shipping fleet required; and the construction of a second inter-oceanic canal in Panama or in Colombia.

As in our examination of the railroads, roads, and canals, the ports must be studied as part of a total transportation grid. All major ports will be points of interface between ships, trains, trucks, and usually inland waterways. The weaknesses of the present ports are legion, including inefficient design, minimal use of containerization, and the interminable customs delays in clearing freight, even between neighboring countries. Required are a combination of short-term measures to increase port throughput capabilities to handle the expected cargo increases in the next five years, and longer term projects for the redesign of existing ports and the construction of selected new ports, including deep-water superports to handle the much larger volumes of cargo that must be accommodated by the year 2000, and 2015.

The central element of both the short-term and long-term solution must be the large-scale shift from "break-bulk" cargo carrying, where cargoes are just loaded directly into the holds of ships, and must be laboriously unloaded, often taking many days, to containerization, where all cargo is in standard-sized containers that can be quickly off-loaded by specially designed cranes, and stacked or placed directly on waiting trains or trucks for departure. Not only will the shift to containers double or triple cargo-capacity with the same number of berths, but the containers are the essential element of efficient interface with the other modes of transport for all but bulk cargos.

Second, specialized terminals, either new ports or sections of existing ports, must be expanded to handle the specific bulk cargoes that each port imports or exports. There are specially designed methods for loading and unloading grain by means of suction pumps, and other methods for handling metallic ores and other bulk commodities.

There is another mode of shipment that promises both to relieve short-term congestion until major expansion can take place, and to permit small ports on inland waterways to communicate directly and efficiently with foreign ports. This is the technique whereby a lighter barge is hoisted by cranes directly into the hold of the larger LASH (Lighter Aboard Ship) ship, and carried to its point of destination, where it is unloaded from the mother ship. The barge can originate, for example, far upstream on the Parana or Amazon river, from Mutum or Iquitos, travel down the river to its mouth, and be directly loaded onto the LASH ship without requiring a seaport for offloading and reloading onto the oceangoing ship. This type of multiple shipping procedure, although still in the development phase, is internationally known as LASH.

Bottlenecks can also be avoided by using huge boats with ramps for the entrance and departure of vehicles, the Roll-on Roll-off ship, or—as it is known in shipping slang, the Ro-Ro ship. These ships, which are essentially huge ferry boats, carry cargo already loaded on trucks or freight cars, or cargo that is itself vehicles, that are simply driven on at one point and driven off at the other. Special ports need to be constructed to accommodate Ro-Ro ships. With these ships, a rail link could be established across the mouth of the Amazon River, by ferrying whole freight trains across the estuary.

Certain Ibero-American ports, by these methods, will be able to significantly expand the cargo they handle, as has occurred in recent years with the port of Rotterdam in Holland, and that of Singapore. But new ports will also have to be constructed, or where feasible, small ports with the potential for expansion must become major ones. The model for this approach is Mexico's program for creating four "superports." The budgetary restraints imposed by the International Monetary Fund have halted construction on two of the four, and slowed completion of the remaining two, but the concept remains valid, and all four projects must be completed as originally planned.

Sites for similar new ports must be identified and designed at strategic points along both coastlines of the continent. In most cases, it is likely that the chosen site will already be at least a small port, but one that can be reconstructed and expanded on the superport model. One such project will be the creation of major transshipment ports on either end of the new inter-oceanic canal. These ports will be capable of receiving the largest ships, and will serve as centers of cargo distribution to smaller ships, for transport to smaller ports throughout Central America, the Caribbean, and the contiguous coastline areas of Colombia and Venezuela.