

1.201J / 11.545J / ESD.210J Transportation Systems

FALL 2006

ASSIGNMENT 5: Expanding the Panama Canal

Date assigned: November 3, 2006

Date due: Friday, November 17, 2006

Value: 6 points

You should work on this assignment in groups of two. We would prefer you find different partners than you had on A3 and A4, but won't mandate that.

To set the stage, we quote from a New York Times article from October 23, 2006 titled "Panamanians Vote Overwhelmingly to Expand Canal"

"Panamanians on Sunday overwhelmingly endorsed the plan to modernize the country's aging canal, won over by government arguments that the \$5.25b project would generate jobs and keep the canal relevant for future generations"

"The overhaul to begin next year will double the canal's capacity by adding a third set of locks that are 40% longer and 60% wider than the current ones constructed by the United States in 1914. The canal these days is congested and too small to handle the world's largest container vessels and tankers."

Since being constructed in 1914, the Panama Canal has proven to be a vital link in the global freight transportation system, facilitating transportation of freight between many countries, and because of its strategic position, avoiding circuitous routes involving ships going around the southern tip of South America to access their destinations. The Canal has been expanded and upgraded over time.

Consider the following situation: you are a shipper in the New York metropolitan area on the East Coast of the United States shipping *containers* to a customer in the Los Angeles metropolitan area on the West Coast of the United States. You have four transportation options:

1. You can transport overland by truck
2. You can transport overland using an intermodal combination of truck and rail using a truck, rail, truck sequence

3. You can transport using container ships that can use the current-day Panama Canal from the Port of New York and New Jersey to the Port of Long Beach.

4. You can transport using the new larger container ships from the Port of New York and New Jersey to the Port of Long Beach. However, since these ships cannot pass through the current-day Panama Canal, they must travel around Cape Horn on the southern tip of South America in order to go from the East Coast of the U.S. to the West Coast.

Assume that the shipper and the receiver have only truck access. For Options 3 and 4, assume a truck move is needed to move the containers from the shipper to the containerships and to the receiver from the containerships.

Please respond to the following questions, using the number of points for each to guide your level of effort.

a) Discuss the way you would go about choosing among these four transportation options stating your results both in text and in a series of algebraic equations. You don't have to indicate your choice but rather just make clear *how* you would choose. You will have to make various assumptions about the operation of these various transportation links and the logistics systems of the shipper and receiver of the goods. Please document them carefully. (3 points)

b) Now suppose we fast forward ten years into the future, and the Panama Canal has been expanded as planned. Now the larger ships of Option 4 can pass through the canal. This will change some of the parameters in your algebraic equations from a) above. Discuss which ones will change and the direction of that change and the implications for your mode choice, reflecting the new realities of East Coast to West Coast freight transportation services. Again, document any assumptions. (2 points)

c) Now consider this from the point of view of the containership operator. Explain how the expansion of the Panama Canal would impact on the fleet composition decisions the fleet owner would make. In this case, simply use text. Please note that, of course, the fleet owner has customers other than the one above and serves other origin-destination pairs. (1 point)