



**Preliminary engineering study  
Pre-feasibility of Panama Canal  
Atlantic Crossing**

**Estudio preliminar de ingeniería  
Prefactibilidad del cruce del Atlántico  
del Canal de Panamá**

**ACP**

**Julio del 2005**

**Resumen Ejecutivo**

## EXECUTIVE SUMMARY

Construction of new locks on the Atlantic side of the Panama Canal will interfere with the existing road network connecting the east and west sides of Colon Province. As a result, it will become imperative to include a crossing alternative that provides uninterrupted traffic during and after construction of the future Panama Canal Atlantic locks.

Different crossing alternatives were analyzed for the Panama Canal Atlantic Crossing. Table R-1 shows a list of the considered crossing alternatives and their associated costs. Initial construction costs and life cycle costs for a 25 year planning horizon are presented. Initial costs for the life cycle cost analysis also include project development costs which include design, contract management and contingencies.

	Alternative B-1 2 lane bridge	Alternative B-1 4 lane bridge	Alternative B-2 2 lane bridge	Alternative B-2 4 lane bridge	Alternative T-1 2 lane tunnel	Alternative F1-A Ferry System	Alternative F1-B Ferry System
Construction Cost (\$)	142.92M	178.6M	152.8M	191.1M	244.7M	3.6M+8M (Terminal + Boats)	3.5M+8M (Terminal + Boats)
NPV (\$)	155.2M	193.5M	164.3M	205.1M	274.1M	17.6M	17.6M

**Table R-1. Crossing alternatives and Costs**

Alternatives B-1 and B-2 involve crossing the canal with high level bridges. Both consist of cable-stayed bridges located to the north of the existing canal. Bridge vertical clearance is selected at 80m above mean low water to proved passage for ACP floating

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equipment and future Post-Panamax vessels. Horizontal clearances are selected as required for dry construction of piers. Bridge alignments were selected based on the two probable alignments for the future Atlantic Locks. Both alternatives allow a crossing capacity of at least 700 vph per lane, assuming a traffic composition including 15% heavy vehicles and 12% buses.

Alternative B-1 provides a 500m horizontal clearance while spanning the existing and new navigation channels for future lock in alignment A2 under its main span.

Alternative B-2 provides a 550m horizontal clearance spanning the new navigation channel on alignment A1 under its main span, and 266 horizontal clearance spanning the existing channel under the west sidespan.

Two bridge widths are presented for each alignment, 2 lane and 4 lane. No projection of future traffic demand exists to date, therefore, both alternatives are left open for future reference when a complete traffic study is undertaken.

Only one tunnel alignment (T1) with two lanes of traffic was considered. Tunnel alternatives provide similar crossing capacities as bridge alternatives. The tunnel on this alignment has the shortest portal-to-portal length, passing below the future locks on alignment A2. Alignment A1 will require a longer tunnel, or with steeper grades. Cost analyses for alternative T-1 indicate that it is not the best alternative from an engineering and cost point of view, therefore, no additional effort was spent on tunnel alternatives for other lock alignments.

Ferry alternatives provide the lowest initial investment and the lowest life cycle cost. For actual traffic levels, a ferry service can provide an efficient transportation link between both sides of the canal. However, as population grows, a ferry crossing may have to grow proportionally to such an extent as to interfere with canal operations. As shipping traffic through the Panama Canal is also expected to increase in the future, a hard link crossing may prove to be a more viable alternative.

Future actions required as a result of this study include:

- Definition of the final crossing alternative based on the alignment of the future locks on the Atlantic side.

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- Definition of the final crossing corridor, based on the alternative decided, and determination of right-of-way requirements.
- Development of a complete socioeconomic analysis of the area, including growth projections based on the different crossing modes. This will provide economic insight as to the most favorable crossing alternative, which up to this point has only been suggested on the basis of financial and engineering criteria.
- Determine future traffic projections for the area under study, taking into account the development of all modes of crossing, in order to permit final dimensioning of the selected crossing mode.
- Include the crossing costs as a part of the mitigation costs associated with construction of new locks on the Atlantic side. Even though this project is an infrastructure project, it should be regarded as a mitigation measure for negative effects caused by expansion of the Panama Canal.
- As soon as the final alignment and location of the future Atlantic locks is decided, Panamanian government authorities should be involved in the decision making process leading to the final crossing alternative, as it will become part of the national transportation network.