



VALUING THE PANAMA CANAL FOR INSURANCE PURPOSES

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BACKGROUND

Completed in 1914, the Panama Canal (Canal) is considered one of the largest and most difficult engineering projects ever undertaken. The Canal extends approximately 50 miles, through the Isthmus of Panama, from the twin ports of Cristobal-Colón on the Atlantic Ocean side to the port of Balboa (near Panama City) on the Pacific Ocean side. Tropical forests and mountains made for arduous conditions during the building of the Canal. In fact, more than 27,000 workers perished during its construction due to tropical diseases, such as yellow fever and malaria, and environmental conditions such as landslides.

The Canal, controlled by the United States until 1999 when it was turned over to Panama, has had an enormous impact on shipping. The Canal shortened the distance between the Atlantic and Pacific Oceans by up to 9,000 miles, saving ships from the long and treacherous journey

around Cape Horn, the southern tip of South America. For example, ships bound for Japan from the East Coast of the United States save approximately 3,000 miles by going through the Canal.

The Canal has also had a transformative impact on Panama and the region. Despite its small population and area, 3.8 million people and 29,157 square miles, respectively, Panama has become an important center for international trade in the Western Hemisphere, as both a major shipping thoroughfare and a regional economic power.

As a means to extract part of the time and cost savings, a toll is charged to any ship traversing the Canal. Tolls for the Canal are determined by the Panama Canal Authority or Autoridad del Canal de Panamá (ACP), the autonomous agency of the Government of Panama charged with managing, operating and maintaining the Canal. Tolls are

based on vessel type, size, and type of cargo carried. The most expensive toll for Canal passage to date was charged to the Norwegian Pearl cruise ship, which paid \$375,000 for passage. The average toll, however, is around \$54,000.

VALUATION ILLUSTRATES THE PROCESS USED TO VALUE A MAJOR LANDMARK

In 2014, Valuation Research Corporation (VRC), a leading provider of independent valuations, was engaged by the ACP to value the locks, dams, power plants and other structures of the Canal for insurance purposes. This wasn't the first time VRC was engaged by the ACP. In 2004, VRC provided a comprehensive valuation in connection with financing the Canal's expansion.

In its 100th year, the Canal is still considered one of the largest and most difficult engineering projects ever undertaken. But as the Canal completes its expansion, including a doubling of the cargo-carrying capacity for ships traversing the Canal, the ACP faced a need to protect its investment for increased insurance risk. Consider this:

- 12,000 ships navigate the Canal each year
- The expansion will add 12 to 14 larger vessels per day or an additional 4,750 ships per year
- Many of the new vessels will be larger container vessels carrying significant cargo
- 3% of the world's maritime commerce already transits through the Canal

In addition to the sheer volume of goods transported through the Canal, the significant expansion of traffic could lead to more shipping incidents, impeded traffic, and risks of business interruption. And unfortunately, increased geo-political risk makes any landmark subject to new security risks that were not part of prior insurance evaluations.

The ACP was interested in procuring appraisal services related to the buildings and major structures of the Canal in order to determine their Replacement Cost New (RCN) for insurance purposes. RCN is the current cost of replacing an asset with a new unit using current materials, standards, designs and layout, and having the nearest equivalent utility to the asset being replaced.

The challenge is in the very long-lived nature of the assets

being valued. The Canal had used book value for insurance purposes in the past. Book value includes all associated asset costs and is generally too high for insurance purposes, not to mention that many of the assets had outlived their normal lives. Further, standard insurance valuations only include above-ground assets, whereas many of the Canal's assets, such as footings and foundations, are below ground but critical to the Canal's operation and therefore necessary to insure.

Insurance users often look at the original cost of an asset to estimate insurance coverage. However, as years pass, original cost becomes less reflective of the true value of an asset for insurance purposes. This is particularly true when you look at the age of the Canal. The ACP needed an accurate estimate of current replacement cost for its insurance coverage. Without a true insurance appraisal, the Canal could be underinsured.

Making the valuation even more complex is the sheer size of the Canal and the diverse areas surrounding it.

Most insurance losses tend to be partial. VRC's valuation included an inventory of all assets by department and location. This facilitates the ACP's ability to make a claim in case of a loss. For

example, on the Atlantic side, there is a risk for terrorism. The area close to Colón typically has more problems related to safety in the community, while the Panama City side is relatively safe. In the end, whatever the risk, an individual valuation of each asset supports claim requirements in case of a loss. Typical risks might include:

- Political and terror-related risks
- Natural disasters
- Fire
- Lightning strikes
- Marine, vehicle or other accidents

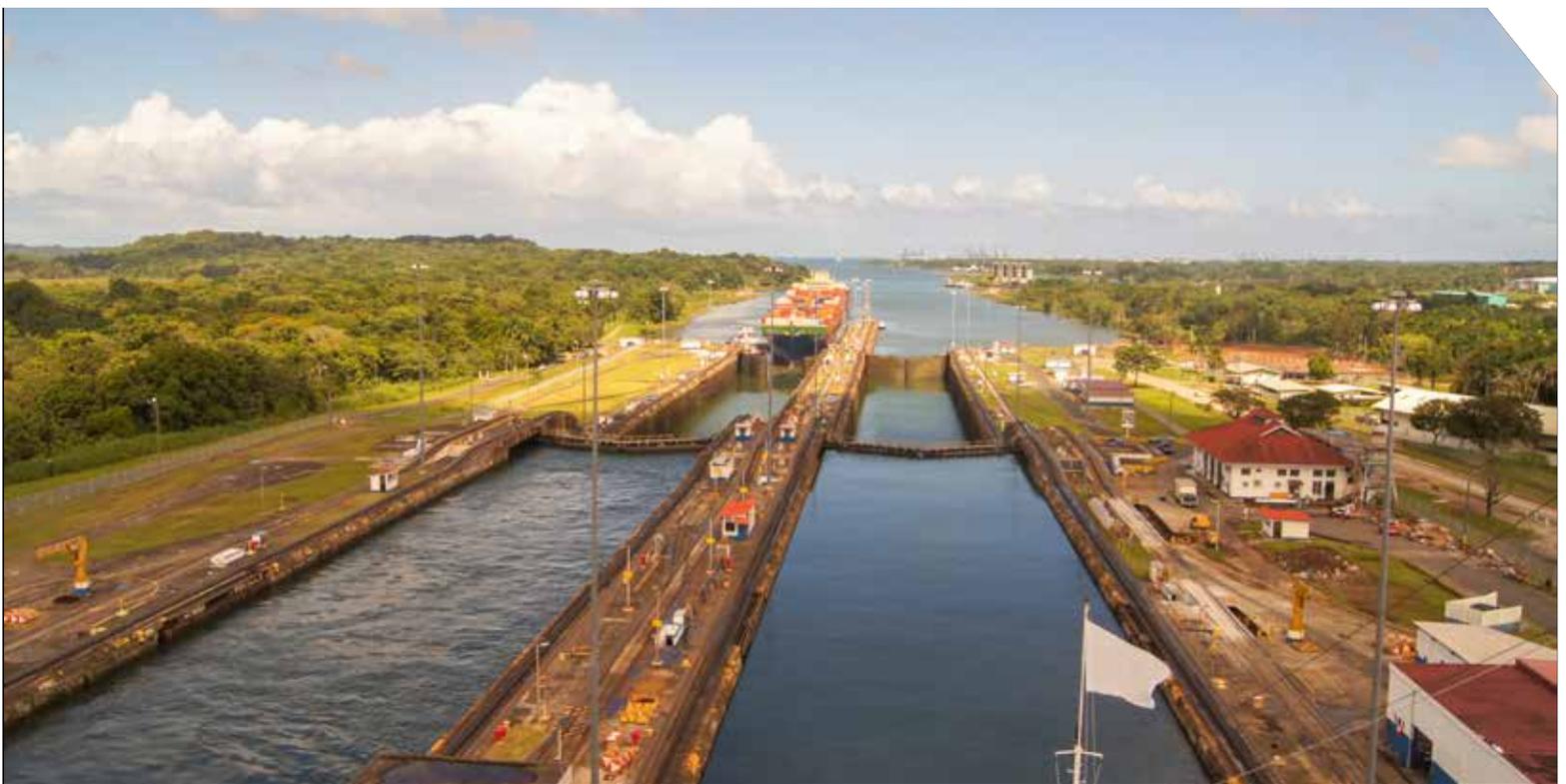
THE VALUATION PROCESS

At first glance it seems like a truly daunting task to place a supportable value on the Canal's assets. However, the engagement scope and methodology provided a process for the valuation to be based on objective and verifiable criteria.

First, the process began by identifying the significant number of buildings, major structures (including locks, dams, and power plants) and other structures (tie-up

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stations, docks, bridges, and tanks) to get a sense of the entire scope of the project.

Next, on-site visits were organized and conducted to personally inspect the assets, interview the ACP engineers who are familiar with the equipment and systems, and create an inventory of the assets by location and facility along the Canal.

The methodology applied in arriving at insurable value conclusions needed to be consistent with the standards and guidelines set forth by the International Valuation Standards Committee. This methodology included a review of the fixed asset records, prior appraisals, the inspection of assets, discussions with ACP personal, and other relevant information. A cost approach was selected as the valuation technique to value the assets. This methodology uses the concept of replacement as a value indicator. Under this approach, the value of an asset is based upon the current cost of replacing the asset with a new unit of equivalent utility.

VALUATION OF BUILDINGS

The ACP provided a schedule for each of the 108 buildings located on their properties. Each building was individually inspected with photographs taken to document the observed condition and the type of improvements. Using the ACP's database, fixed asset records, architectural plans, and information received from ACP engineering

personnel, a RCN estimate was developed for all buildings using the cost approach.

Major building components were individually priced using published construction pricing guides and were compared to the values obtained from all other sources. In-house appraisals and appraisals performed by independent government agencies were also considered in arriving at final RCN value conclusions.

VALUATION OF MAJOR STRUCTURES

The cost approach was also used to determine RCN for the Canal's locks, power plants, dams/spillways, water filtration plants, tie-up stations, docks, bridges, and tanks. The valuation process was started with an inspection of the major structures. RCN was estimated by using material and labor cost data obtained through Marshall Valuation Service (Marshall & Swift/Boeckh) and other sources. Local adjustment factors were applied to cost data to reflect regional and local Panamanian construction costs. Information from utility and engineering consultants, applicable to the various types of construction, was also considered. The RCN determined under this method was then compared to construction costs for recently completed dams in other parts of the world.

In addition to the direct pricing method described above, an indirect cost pricing approach was also used. Under this method, RCN was developed by applying cost indices



to the original (historical) costs provided in the fixed asset record. Indices were developed for the various classes of construction assets and equipment based upon information from construction databases, fixed asset records, and ACP engineering personnel.

CONCLUSION

Undertaking a valuation that considers the scope, complexity, and history of the buildings and structures of the Panama Canal may seem overwhelming. However, through the use of Generally Accepted Valuation Principles and careful consideration of multiple data sources and inputs, a supportable cost approach analysis could be developed for insurance purposes.

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ABOUT VRC

Valuation Research Corporation (VRC) is a leading, independent, full-service valuation firm that has provided objective and supportable conclusions of value for more than 40 years to corporate clients on both a domestic and international basis. With a global network of over 750 valuation professionals, VRC supports a client base that ranges from small and middle market privately-held companies to large public corporations across all industries. VRC also works closely with private equity firms, attorneys, not-for-profit institutions, fiduciaries and individuals.

Our services include valuations of intangible assets, business enterprises and fixed assets, solvency opinions and fairness opinions. For accounting and tax reporting purposes, we provide valuations in support of allocation of purchase price, goodwill impairment, stock based compensation, legal entities and deferred compensation.

Our locations include eight domestic offices with approximately 100 employees in Boston, Chicago, Cincinnati, Milwaukee, Princeton, San Francisco and Tampa as well as nine global affiliates with over 750 valuation professionals in Argentina, Australia, Brazil, China, Colombia, Mexico, Spain and the United Kingdom.



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