Introduction

August 15, 2015, will be the 100th anniversary of the official opening of the Panama Canal, the American-built waterway across the Isthmus of Panama that connects the Atlantic and Pacific oceans. France began work on the canal in 1881, but had to stop because of engineering problems and high mortality due to disease. The United States took over the project in 1904, and took a decade to complete the canal, which was officially opened on August 15, 1914. One of the largest and most difficult engineering projects ever undertaken, the Panama Canal shortcut greatly reduced the time for ships to travel between the Atlantic and Pacific Oceans, enabling them to avoid the lengthy, hazardous Cape Horn route around the southernmost tip of South America via the Drake Passage or Strait of Magellan. The 50-mile-long passage created an important shortcut for ships; after the canal was constructed, a vessel sailing between New York and California was able to bypass the long journey around the tip of South America and trim nearly 8,000 miles from its voyage. The canal, which uses a system of locks to lift ships 85 feet above sea level, was the largest engineering project of its time.

History and Construction of Panama Canal

In 1513, Spanish explorer Vasco Núñez de Balboa became the first European to discover that the Isthmus of Panama was just a slim land bridge separating the Atlantic and Pacific oceans. Balboa’s discovery sparked a search for a natural waterway linking the two oceans. In 1534, after no such passage across the isthmus had been found, Charles V, the Holy Roman emperor, ordered a survey to determine if one could be built, but the surveyors eventually decided that construction of a ship canal was impossible. From that point forward, the Spanish and then the Dutch, French, British, and Americans would seek to create a path between the seas that would shorten the trip from the Atlantic to the Pacific without traveling around Cape Horn. It would take nearly four centuries to accomplish the goal. The canal builders had to contend with a variety of obstacles, including challenging terrain, hot, humid weather, heavy rainfall and rampant tropical diseases. The earlier French attempts had to the deaths of more than 20,000 workers and American’s efforts fared little better, between 1904 and 1913 some 5,600 workers died due to disease (yellow fever and malaria) or accident.

1. Early Plans and Construction of the Canal

In 1829, Once Colombia won independence from Spain, European and American interest in the canal began in earnest as Panama remained a province of Colombia. Simón Bolívar commissioned a British engineer, John Lloyd, to study building a canal across Panama.
In 1834, with a positive report, the Colombians threw open the bidding promising 100,000 acres of land and revenues for fifty years. In the mid-1830s, President Andrew Jackson sent Charles Biddle to Central America. He negotiated with Bogotá to build a road to the navigable Chagres River and import two steamships to conduct trade across the isthmus. For his work, Bogotá promised 140,000 acres, an additional 750,000 at fifty cents an acre, and a fifty-year lease. All Biddle’s efforts were for naught, however, as Jackson lost interest when a rival Dutch plan in Nicaragua failed.

By the late 1840s, British and U.S. officials decided to negotiate for a “highway” across Central America, to be open to all nations. On 19 April 1850, Sir Henry Bulwer and U.S. Secretary of State John Clayton signed the Clayton-Bulwer Treaty. Both promised never to monopolize or fortify the proposed canal and agreed that neither would colonize any new part of Central America. While little happened during the next forty years to advance construction of a waterway outside of the creation of railroads and steamship enterprises, people still dreamed about a trans-isthmian canal.

In the 1880s, the great French engineer Ferdinand de Lesseps, builder of the Suez Canal, won a concession from the Colombian government to construct a canal in Panama. His French Canal Company failed miserably, but his successors retained the concession and asked $109 million for it.

In 1898, the war with Spain renewed interest when the U.S. Pacific Fleet had to travel around South America to Cuba. In 1901, the new president, Theodore Roosevelt, soon addressed a major obstacle, the Clayton-Bulwer Treaty. In November of that year, after tedious negotiations, Secretary of State John Hay and the British ambassador to Washington, Lord Pauncefote, signed an agreement that superseded the Clayton-Bulwer Treaty and permitted the United States to build and fortify a Central American canal.

With the British out of the way, Roosevelt made construction of the canal a priority, announcing his intention to make “the dirt fly” in Central America. In September 1901, as Roosevelt had taken office a commission had recommended a Nicaraguan canal. In January 1902, Working on the recommendation, the House of Representatives voted 308–2 to pursue the Nicaraguan canal. The French company, now called the New Panama Canal Company and led by Philippe Bunau-Varilla, swung into action. It hired a high-powered American lobbyist, William Cromwell, who had personal access to the White House.

In June 1902, Cromwell and Bunau-Varilla succeeded, and Congress passed the Spooner Act, a measure that allowed Roosevelt to negotiate for the right of way in Panama. Secretary of State Hay immediately set about the task of coming to an agreement with the Colombians.

In January 1903, he and a Colombian diplomat, Tomás Herrán, signed an accord. The treaty granted the United States the right to build a canal zone six miles wide. In return, the United States promised a payment of $10 million and annual payments of $250,000 after nine years, with the lease renewable in perpetuity. Immediately Bogotá expressed reservations and told Herrán to wait for new instructions. The U.S. Senate refused to delay and approved the treaty in March 1903. Problems resulted when the Colombians balked at the original agreement.

In August 1903, the Colombian congress unanimously rejected the Hay-Herrán Treaty. In response, Cromwell and Bunau-Varilla began formulating plans for Panama’s secession from Colombia and for American ownership of the canal. Plotting from the New York Waldorf-Astoria Hotel during the summer of 1903, the group planted newspaper stories about Panama’s plan to rebel and grant the United States sovereignty over the Canal Zone. They also gathered money for bribes of Colombian officials and organized a small army.

On 3 November 1903, the Panamanians launched their rebellion. By the end of that day the rebels had formed a provisional government and unveiled a constitution, one written in New York. The presence of the USS Nashville and the use of bribes allowed a successful revolution. In one day and with only one death, the new Republic of Panama was born. Washington immediately extended diplomatic recognition. Within several days, Bunau-Varilla (who had received permission from the provisional government to represent Panama) began negotiations.

On 18 November, the two parties signed the Hay–Bunau-Varilla Treaty. It gave the United States a ten-mile strip of land, all the rights to construct and administer a canal, and the right to protect the canal. In return, the Panamanians received $10 million and an annual rent of $250,000. Washington also promised to maintain Panama’s independence. Despite some criticisms of the agreement, Roosevelt pressed the Senate for ratification, urging it to follow the example of the Panamanian Congress.

On 23 February 1904, after spirited debate, the Senate voted 66–14 to accept it. Immediately Washington purchased the assets of the New Panama Canal Company for $40 million. The Panamanians received their money and American engineers quickly set to work. The canal took a decade to complete. It was a technological marvel, composed of a series of six locks that linked various waterways.

In 1913, Under the supervision of the engineers John F. Stevens (1905–1907) and Lieutenant Colonel George W. Goethels (1907–1914), the Canal Commission completed the construction with substantial assistance from workers imported from the Caribbean islands and southern United States, in numbers exceeding 44,000. Employing heavy machinery—and benefiting from new techniques to reduce yellow fever and other tropical diseases in an effort led by Dr. William Crawford Gorgas—the laborers created a new society within the newly independent Panama.

On 15 August 1914, The canal opened for commerce. The United States now had major new support for its economic and military growth as the water route from New York City to San Francisco shrank from 13,165 miles to 5,300.

2. Panama Canal Zone, 1914–1979

For nearly forty years, the Panama Canal Zone operated under various acts of Congress with executive supervision.

In 1950, Congress passed the Thompson Act, which created the Panama Canal Company, operated under the auspices of a board of directors. A governor of the Canal Zone, appointed by the U.S. president, monitored the day-to-day operations of the zone and used revenues to make improvements and maintain the canal. In addition, the U.S. military maintained bases in the Canal Zone to protect the important strategic site.

Throughout the period, Panamanian nationalists clamored for more beneficial terms than those in the 1903 treaty. A 1936 agreement increased the annuity paid by the U.S. government to Panamanians, and a 1942 treaty transferred various civil works projects to the Panamanian government and promised additional infrastructure development. Additional revisions occurred in the 1950s, including the flying of the Panamanian flag in the Canal Zone as the United States tried to address issues of sovereignty. Despite compromises, tensions continued to mount.

In January 1964, the most serious confrontation over the canal developed. American high school students, supported by their parents, refused to raise the Panamanian flag at the Canal Zone’s Balboa High School. Panamanians marched to show their flag near the school. As they neared, an American mob attacked them, tearing the flag. The news quickly spread, and thirty thousand Panamanians descended on the main avenue approaching the Canal Zone. Snipers poured hundreds of rounds into the U.S. positions, and U.S. troops fired back. Riots erupted as Panamanians destroyed American businesses. Panama’s President Roberto Chiari suspended diplomatic relations, and hardliners in Congress urged President Lyndon Johnson to respond with force.
However, Johnson chose to negotiate and dispatched Thomas Mann and Secretary of the Army Cyrus Vance to mediate the dispute, which Johnson blamed on the communists. After four days of fighting and looting, the Panamanian National Guard reestablished order. Four Americans died and eighty-five were wounded. Twenty-four Panamanians died and more than two hundred were wounded. The fighting caused more than $2 million in damage, much of it to American businesses.

While blaming the communists, most American policymakers could not ignore the animosity that provoked the confrontation. In the aftermath, the Chiriqui government and the Johnson administration opened negotiations to address Panama's grievances. Ultimately Washington agreed to terminate the 1903 treaty in return for granting U.S. control and operation of the canal until 1999. Despite strong public criticism, Johnson submitted the treaty to the Senate in 1967. It languished there as Johnson's attentions focused on Vietnam and internal events in Panama sabotaged acceptance. It would take another Democratic president, more than a decade later, to push through Johnson's original ideas.

3. The Panama Canal Treaty

In 1977, President Jimmy Carter took control of the White House. One of his first goals regarding Latin America was the settlement of the Canal Zone debates. Carter believed that a treaty would have a positive impact on U.S.–Latin American relations. Carter and Secretary of State Cyrus Vance built on negotiations begun by Johnson and continued by Henry Kissinger during the presidencies of Richard Nixon and Gerald Ford. The Carter administration pushed hard for a treaty, dealing closely with Panamanian dictator Omar Torrijos, who had controlled the country since 1968. Tense negotiations headed by Ellsworth Bunker and Sol Linowitz continued for nearly a year.

On 11 August 1977, the parties held a press conference in Panama and unveiled the treaty. It had several parts, starting with the process of returning the canal to Panama by 31 December 1999. Second, the treaty guaranteed the rights of American workers in the Canal Zone through their retirement. Third, it provided the United States with a permanent right to defend the canal's neutrality. Last, Washington increased payment for its use of the canal from $2.3 million to $40 million annually and promised additional economic and military assistance.

In April 1977, the announcement of the treaty stirred debates in both countries. Since the treaty required approval by the Panamanian people (as outlined in their constitution) and confirmation by a two-thirds vote of the U.S. Senate, victory appeared far away. In Panama, Torrijos pushed through the plebiscite in Panama, although not without opposition. In the United States, the Senate began deliberations in the summer of 1978. President Carter and his staff pushed hard, winning the support of diverse groups including the Pentagon (which believed the canal had outlived its tactical purpose) and the Catholic Church along with distinguished diplomats including Kissinger. Over time, Carter won the backing of important senators from both parties including Senate Majority Leader Robert Byrd (D-West Virginia) and Senate Minority Leader Howard Baker (R-Tennessee). With promises of compromise and pork barrel projects, the pro-treaty group moved forward. Throughout the summer the foes battled on the floor of the Senate and in public forums. Carter secured an extra promise from Torrijos guaranteeing the right of the United States to defend the Canal Zone after 2000, which won additional votes.

In March 1978, the Senate approved the neutrality part of the treaty 68–32. By mid-April, they approved the other part of the treaty, outlining administration through 2000, by the same vote. Carter, the Senate leadership, and pro-treaty forces enjoyed a major victory. The president emphasized that the treaty symbolized the efforts by the United States to create not only positive relations with Panama but with other Third World countries. The goal was partnerships based on mutual respect.


In October 1979, the process of turning over the canal began as Carter's term was ending. The Panamanians gained control over the former Canal Zone, and the Panama Canal Commission, composed of Americans and Panamanians, began the process of overseeing the transition.

In the summer of 1980 a Committee on the Environment and a Coordinating Committee began working to implement sections of the treaty.

During the 1980s, the Panama Canal remained an issue of concern to the United States. Some thought that the election of Ronald Reagan might mean that the treaty would be overturned as he had been one of its leading critics during the presidential debates. But in fact the movement toward transition continued unabated during his two terms. More Panamanians became integrated into the Canal Zone as policemen and pilots, and American employees there gradually were weaned off their ties to the U.S. government.

In the 1980s, Furthermore, the presence of the left-wing Sandinistas in Nicaragua and possible threats in the Caribbean led Americans to continue to view the Canal Zone and its defense installations as vital to U.S. national security. This made them fearful of provoking a confrontation in Panama. Reagan administration officials worked with General Manuel Noriega, who had replaced Torrijio after his death in a mysterious plane crash. Noriega allowed the contras—right-wing foes of the Sandinista government who were supported by the Reagan administration—to train in his country. While rumors had swirled for many years about Noriega's ties to the drug trade, U.S. leaders ignored them. In fact, the Drug Enforcement Agency (DEA) and Attorney General Edwin Meese sent letters of commendation to the Panamanian dictator. Noriega also regularly received U.S. dignitaries, including Vice President George H. W. Bush, to discuss policy issues.

By the middle of the 1980s, problems began to develop. As the Iran-Contra scandal blossomed and Reagan's credibility suffered, the tales of Noriega's drug ties became more prominent. Senator John Kerry (D-Massachusetts) held hearings in the Senate Foreign Relations Committee's Subcommittee on Terrorism, Narcotics, and International Operations that further substantiated published reports about Noriega's drug are trafficking and money laundering.

In 1989, When George H. W. Bush took office as president he began concerted efforts to deal with Noriega, building on some late efforts by Reagan. The problem became more complicated when a Miami grand jury indicted Noriega on drug charges in 1988.

In early 1989, Tensions heightened when Noriega overturned an election. Critics jumped on Bush's failure to do anything. Even when an opportunity presented itself in the form of a coup by disenchanted Panamanians, he did nothing. Soon after, Noriega defiantly declared a "state of war" between Panama and the United States, often brandishing a machete at mass anti-American rallies. With relations deteriorating, Panamanians killed an off-duty marine, and the Panamanian Defense Forces beat an American officer and threatened to rape his wife. Bush concluded that he had enough.

On 20 December, the United States attacked Panama with more than twenty thousand men. Code-named Operation Just Cause, the Pentagon employed all the latest weaponry including Stealth bombers. Hundreds of Panamanian civilians perished in the cross fire between the Panamanian Defense Forces and U.S. troops (twenty-three Americans died). The fighting inflicted more than $1 billion of damage in Panama City, especially in the poorest areas, where thousands found themselves homeless. Noriega evaded capture for fifteen days, but on 3 January 1990 he finally left his sanctuary in the papal nunciature (papal diplomatic mission headed by a nuncio), and DEA agents immediately put him on a plane to Miami. In the aftermath of Operation Just Cause, the United States installed in office the legally elected president, Guillermo Endara. Washington poured more money into the country, but unemployment and poverty remained high.
In 1994, one of Noriega's cronies, Ernesto Pérez Balladares, won the presidency. As for Noriega, an American jury sentenced him to forty years in jail without parole. Most observers concluded that despite Noriega's removal, the invasion accomplished little in stopping the drug trade and in fact created more animosity toward the United States.

In the aftermath of the invasion, despite calls from some Americans for a total renegotiation of the Panama Canal Treaty, it moved forward. In September 1990, Gilberto Guardia Fabréga became the Panama Canal Commission administrator, the first Panamanian in such a high position. Throughout the 1990s, the process continued. In 1997, the Panama Canal Authority was created, the final step toward removing any U.S. government control.

In September 1998, Albert Alemán Zubieta became the first administrator of the Panama Canal Authority. Soon after, Panama's legislative assembly created the Canal Authority's budget for its first fiscal year of 2000. All of these steps led to great fanfare for the celebration of 14 December 1999. Foreign dignitaries attended the ceremony where the United States completely relinquished its claim to the canal. Former president Jimmy Carter signed for the United States while Panamanian President Mireya Moscoso represented the new owners.

Officially, on 31 December 1999, the Panama Canal became the possession of the nation of Panama.

### Navigation through the Canal
The Panama Canal is a 77 km long waterway across the Isthmus of Panama. It is a key channel for international marine trade in Panama. The canal joins the Atlantic Ocean and the Pacific Ocean. The Canal runs in south and Southeast direction from Limón Bay at Colón on the Atlantic to the Bay of Panama at Balboa on the Pacific is 64 km long from shore to shore and it is 82 km long between channel entrances.

A trip along the canal from its Atlantic entrance would take us through a 7 mile dredged channel in Limón Bay. The canal then proceeds for a distance of 11.5 miles to the Gatun Locks. This series of three locks raise ships 26 meters to Gatun Lake. It continues south through a channel in Gatun Lake for 32 miles to Gamboa, where the Culebra Cut begins. This channel through the cut is 8 miles long and 150 meters wide. At the end of this cut are the locks at Pedro Miguel. The Pedro Miguel locks lower ships 9.4 meters to a lake which then takes you to the Miraflores Locks which lower ships 16 meters to sea level at the canals Pacific terminus in the bay of Panama.
5. Between 13,000 and 14,000 ships use the canal every year.

American ships use the canal the most, followed by those from China, Chile, Japan, Colombia and South Korea. Every vessel that transits the canal must pay a toll based on its size and cargo volume. Tolls for the largest ships can run about $450,000. The smallest toll ever paid was 36 cents, plunked down in 1928 by American adventurer Richard Halliburton, who swam the canal. Today, some $1.8 billion in tolls are collected annually. On average, it takes a ship 8 to 10 hours to pass through the canal. While moving through it, a system of locks raises each ship 85 feet above sea level. Ship captains aren’t allowed to transit the canal on their own; instead, a specially trained canal pilot takes navigational control of each vessel to guide it through the waterway. In 2010, the 1 millionth vessel crossed the canal since it first opened in 1914.

6. The canal is being expanded to handle today’s megaships.

In 2007, work began on a $5.25 billion expansion project that will enable the canal to handle post-Panamax ships; that is, those exceeding the dimensions of so-called Panamax vessels, built to fit through the canal, whose locks are 110 feet wide and 1,000 feet long. The expanded canal will be able to handle cargo vessels carrying 14,000 20-foot containers, nearly three times the amount currently accommodated. The expansion project, expected to be completed in late 2015, includes the creation of a new, larger set of locks and the widening and deepening of existing navigational channels. However, while the new locks will be able to fit many modern ships, they still won’t be super-sized enough for some vessels, such as Maersk’s Triple E class ships, the planet’s biggest container ships, which measure 194 feet wide and 1,312 feet long, with a capacity of 18,000 20-foot containers.

New locks are currently under construction and it is estimated that they will be completed end of 2015.

### Fact and Figure of Canal

Panama Canal has been operational for one hundred years and has many interesting features. It connects the Atlantic Ocean to the Pacific Ocean via the Caribbean Sea and is vital to international maritime trade. The Panama Canal still regarded as a crowning achievement of 20th century engineering. There are some key facts and figures about the engineering marvel, narrated below.

### Key Facts

- 1881-1888 and 1894-1898: Construction begun under French leadership.
- 1904-1914: The United States continue and complete the canal.
- August 15, 1914: official open for Panama Canal.
- 1977: U.S. President Jimmy Carter and his Panamanian counterpart Omar Torrijos sign a treaty to cede U.S. control of the waterway to Panama.
- December 13, 1999: Panama takes ownership of the canal.
- 2015: Target completion date for expansion project to triple the canal’s capacity.

### Key Figures

- 14,000 ships and 280 million tons of merchandise cross the canal annually.
- 5% of world maritime traffic uses the Panama Canal.
- 80 kilometers (50 miles): length of the canal.
- 20 to 30 hours: time necessary to cross the canal, including wait times. Without wait, time need 8 to 10 hours.
- 26 meters (85 feet): the difference in altitude between the highest point of the canal and sea level.
- 60 centimeters (23 inches): space separating the hull of a Panamax vessel — the largest the canal can currently accommodate — from the bank during passage through its narrowest locks.
- 33.5 meter (110 ft): Current locks is current locks are. A third, wider lane of locks is currently under construction and is due to open in 2016.
- Key routes served by the canal: Asia — east coast of the United States; Europe — west coast of the United States and Canada; east coast of the United States — west coast of Latin America.
- Top users of the canal: United States, China, Japan, South Korea, Germany, EC, etc.
- Annual traffic has risen from about 1,000 ships in 1914, when the canal opened, to 14,702 vessels in 2008, the measuring a total of 309.6 million.
- By 2008, more than 815,000 vessels had passed through the canal; the largest ships that can transit the canal today are called Panamax.
- In 1934 it was estimated that the maximum capacity of the canal would be around 80 million tons per year; canal traffic in 2009 reached 299.1 million tons of shipping.
- The American Society of Civil Engineers has named the Panama Canal one of the seven wonders of the modern world.
Conclusion

The Panama Canal is an amazing feat of engineering that has been described as a man made modern wonder. It is one of the biggest and most difficult engineering projects to ever be undertaken. The tactical location of the Panama Canal and the short distance between the oceans, have provoked many attempts over the centuries to construct a trading route between the oceans. Spanish, Scottish, European had attempted to bridge the oceans but only the French and Americans succeeded.

The canal makes the trip from the east coast to the west coast of the U.S. much shorter than the route taken around the tip of South America prior to 1914. Though traffic continues to increase through the canal, many oil supertankers and military battleships and aircraft carriers can not fit through the canal. There is even a class of ships known as "Panamax" those built to the maximum capacity of the Panama Canal and its locks. It takes approximately around 26 hours to traverse the canal through its three sets of locks (more than half the time is spent waiting due to traffic). Ships passing through the canal from the Atlantic Ocean to the Pacific Ocean actually move from the northwest to the southeast, due to the east-west orientation of the Isthmus of Panama. Annual traffic has risen from about 1,000 ships in 1914, when the canal opened, to 14,702 vessels in 2008, the measuring a total of 309.6 million. In September, 2007 work began on a $5.2 billion project to expand the Panama Canal. Expected to be complete in this year (2015), the Panama Canal expansion project will allow ships double the size of current Panamax to pass through the canal, dramatically increasing the amount of goods that can pass through the canal.

References

2. http://welldonestuff.com/panamacanal/#sthash.mYCZ2db2.dpuf