Suez Canal: The Modern Maritime Wonder

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Abstract

Canal Suez is one of the supreme engineering wonder of the world. The canal is owned and maintained by the Suez Canal Authority (SCA) of Egypt. Suez Canal is connecting Mediterranean and Red Sea and was officially opened on Nov 17, 1869. This maritime wonder took more than 15 years to plan and build. The Canal construction was repeatedly hindered by political disputes, labor shortages and even a deadly cholera outbreak. When finally completed, the 101 NM long waterways permanently transformed international shipping by allowing vessel to skip the long and deceitful transit around the southern tip of Africa. The Suez Canal has enjoyed increased traffic in recent years, with roughly 50 ships passing through its waters every day. However, the canal is still hampered by its narrow width and shallow depth, which are insufficient to accommodate two way traffic from modern tanker ships. In 2014, Egypt’s Suez Canal Authority announced an ambitious plan to deepen the canal and create a new 22-mile lane branching off the main channel. Preliminary work has already begun which Egyptian authorities claim could more than double the canal’s annual revenue by 2023. It is an interesting reviewed paper based both on primary and secondary information and some critical analysis. Paper describes history, engineering and social impact of Suez Canal and excellent ambition of human and present status of one of the maritime success of shipping trade that improving the international maritime business and transportation.

Keywords: Canal; Suezmax; Traffic

Introduction

The Suez Canal (in Arabic Qanat al-Suwais) is an artificial sea-level waterway in Egypt, connecting the Mediterranean Sea and the Red Sea. Canal has opened in November 17, 1869 after 10 years of construction by a French private company. Its construction has repeatedly hindered by political disputes, labor shortages and even a deadly cholera outbreak. It allows ships to travel between Europe and South Asia without navigating around Africa, thereby reducing the sea voyage distance between Europe and India by about 8,200 kilometers (5,100 nm) [1]. The northern terminus is Port Said; the southern terminus is Port Tewfik at the city of Suez. Ismailia is on its west bank, 3 km (1.9 nm) from the half-way point. In 2012, 17225 vessels traversed the canal (47 vessels per day). When built, the canal was 164 km (102 nm) long and 8 m (26 ft) deep [2]. After several enlargements, it is 193.30 km (120.11 nm) long, 24 m (79 ft) deep and 205 meters (673 ft) wide. It consists of the northern access channel of 22 km, the canal itself of 162.25 km and the southern access channel of 9 km. The Canal is really not wide enough to allow two way passages of ships, but there are several passing bays and areas where ships may pass each other in the Bitter Lakes and between Qantarah and Ismailia. The Suez Canal has no locks, because the Mediterranean Sea and the Gulf of Suez have roughly the same water level. In general, the canal north of the Bitter Lakes flows north in winter and south in summer. Three convoys transit the canal on a typical day, two southbound and one northbound [3]. The canal handle averages about 8% of the world shipping traffic. The passage of ship takes between 11 and 16 hours at a speed of around 8 knots. Canal Suez is one of the greatest engineering feats of modern record. The canal is owned and maintained by the Suez Canal Authority (SCA) of Egypt. Under the Convention of Constantinople, it may be used “in time of war as in time of peace, by every vessel of commerce or of war, without distinction of flag [4].” In August 2014, construction was launched to construct a second canal, the New Suez Canal, for half of the route of the canal, costing US$ 8.4 billion, to increase the canal’s capacity. Funding was arranged by issuing interest-bearing investment certificates exclusively to Egyptian entities and individuals and the target amount was collected over only six working days. The expansion is expected to double the capacity of the Suez Canal from 49 to 97 vessels a day. President Abdel Fattah al-Sisi of Egypt has invested in an expansion of the Suez Canal which began in 2014. The Suez Canal authority said in a statement that, Egypt’s revenue from the Suez Canal for the 2017-2018 financial year rose 11.5 percent to a record high $5.585 billion, (by CAIRO Reuter) [27]. [Figures 1&2].
Figure 1: Importance and geographical location of Suez Canal shown in maps [31].

Figure 2: Northern outlet and Southern terminus respectively of the Suez Canal

Historical Chronology of Suez Canal

Suez Canal is connecting Mediterranean and Red Seas and was officially opened in a great ceremony at Egypt’s, Port Said on Nov 17, 1869 [5]. The canal took more than 15 years to plan and build. Its construction was repeatedly hindered by political disputes, labor shortages and even a deadly cholera outbreak. When finally completed, the 101 NM long waterways permanently transformed international shipping by allowing vessels to skip the long and treacherous transit around the southern tip of Africa [6]. There is exciting, surprising and eventful history about the canal that links the Eastern and Western worlds.

Canal Origins Date back to Ancient Egypt

The modern Suez Canal is only the most recent of several manmade waterways that once snaked their way across Egypt. The Egyptian Pharaoh Senusret III may have built an early canal connecting the Red Sea and the Nile River around 1850 B.C., and according to ancient sources, the Pharaoh Necho II and the Persian conqueror Darius both began and then abandoned work on a similar project [30]. The canal was supposedly finished in the 3rd century B.C. during the Ptolemaic Dynasty. There are many historical figures including Cleopatra may have traveled on it. Rather than the direct link offered by the modern Suez Canal, this ancient “Canal of the Pharaohs” would have wound its way through the desert to the Nile River, which was then used to access the Mediterranean [7].

Roman and Muslim Understand the Strategic Importance of Canal

This canal is said to have been extended to the Red Sea by Ptolemy II Philadelphus (285-246 BC), abandoned during the early Roman rule, but rebuilt again by Trajan (98-117 AD) Over the next several centuries, it once again was abandoned and sometimes dredged by various rulers for various but limited purposes. Amr Ibn el-As rebuilt the canal after the Islamic takeover of Egypt creating a new supply line from Cairo, but in 767 AD, the Abbasid caliph El-Mansur closed the canal a final time to cut off supplies to insurgents located in the Delta [7]. Of course, over time, ships grew in size and so the ancient attempts to connect the two seas would not have worked anyway today.

Napoleon Bonaparte Building Plan

After conquering Egypt in 1798, the French military commander Napoleon Bonaparte sent a team of surveyors to investigate the feasibility of cutting the Isthmus of Suez and building a canal from the Red Sea to the Mediterranean. But following four separate excursions to the region, his scouts...
incorrectly concluded that the Red Sea was at least 30 feet higher than the Mediterranean. Any attempt to create a canal, they warned, could result in catastrophic flooding across the Nile Delta [7]. The surveyors’ faulty calculations were enough to scare Napoleon away from the project, and plans for a canal stalled until 1847, when a team of researchers and engineers finally confirmed that there was no serious difference in altitude between the Mediterranean and Red Seas [29].

**British Government Opposed Construction**

Planning for the Suez Canal officially began in 1854, when a French former diplomat named Ferdinand de Lesseps negotiated an agreement with the Egyptian viceroy to form the Suez Canal Company. Since Lesseps’ proposed canal had the support of the French Emperor Napoleon III, many British statesmen considered its construction a political scheme designed to undermine their dominance of global shipping [8]. The British ambassador to France argued that supporting the canal would be a “suicidal act,” and when Lesseps tried to sell shares in the canal company, British papers labeled the project “a flagrant robbery gotten up to despoil the simple people.” Lesseps went on to engage in a public war of words with British Prime Minister Lord Palmerston, and even challenged railway engineer Robert Stephenson to a duel after he condemned the project in Parliament. The British Empire continued to criticize the canal during its construction, but it later bought a 44 percent stake in the waterway after the cash-strapped Egyptian government auctioned off its shares in 1875.

**Canal Built by both Forced Peasant Labor and State-of-the-Art Machinery**

Building the Suez Canal required massive manpower, and the Egyptian government initially supplied most of the labor by forcing the poor to work for nominal pay and under threat of violence. Beginning in late-1861, tens of thousands of peasants used picks and shovels to dig the early portions of the canal by hand. Progress was painfully slow, and the project hit a snag after Egyptian ruler Ismail Pasha abruptly banned the use of forced labor in 1863. Faced with a critical shortage of workers, Lesseps and the Suez Canal Company changed their strategy and began using several hundred custom-made steam- and coal-powered shovels and dredgers to dig the canal [9]. The new technology gave the project the boost it needed, and the company went on to make rapid progress during the last two years of construction. Of the 75 million cubic meters of sand eventually moved during the construction of the main canal, some three-fourths of it was handled by heavy machinery.

**The Statue of Liberty Originally Intended for the Canal**

As the Suez Canal neared completion in 1869, French sculptor Frédéric-Auguste Bartholdi tried to convince Ferdinand de Lesseps and the Egyptian government to let him build a sculpture called “Egypt Bringing Light to Asia” at its Mediterranean entrance. Inspired by the ancient Colossus of Rhodes, Bartholdi envisioned a 90-foot-tall statue of a woman clothed in Egyptian peasant robes and holding a massive torch, which would also serve as a lighthouse to guide ships into the canal [32]. The project never materialized, but Bartholdi continued shopping the idea for his statue, and in 1886 he finally unveiled a completed version in New York Harbor. Officially called “Liberty Enlightening the World,” the monument has since become better known as the Statue of Liberty. Having silenced his critics by completing the Suez Canal, Ferdinand de Lesseps later turned his attention toward cutting a canal across the Isthmus of Panama in Central America. Work began in 1881, but despite Lesseps’ prediction that the new canal would be “easier to make, easier to complete, and easier to keep up” than the Suez, the project eventually descended into chaos. Thousands died during construction in the sweltering, disease-ridden jungle, and the team burned through nearly US$ 260 million without ever completing the project. The company finally went belly up in 1889, triggering a massive scandal that saw Lesseps and several others—including Eiffel Tower designer Gustave Eiffel, who had been hired to design canal locks—convicted of fraud and conspiracy [11]. It would take another 25 years before the Panama Canal was finally completed in a decade-long, American-led construction project.

**Opening the Canal by French**

The canal opened under French control on 17 November 1869. Although numerous technical, political, and financial problems had been overcome, the final cost was more than double the original estimate. The canal had an immediate and dramatic effect on world trade. Combined with the American transcontinental railroad completed six months earlier, it allowed the world to be circled in record time. It played an important role in increasing European colonization of Africa. The construction of the canal was one of the reasons for the Panic of 1873, because goods from the Far East were carried in sailing vessels around the Cape of Good Hope and were stored in British warehouses. As sailing vessels were not adaptable for use through the canal, because the prevailing winds of the Mediterranean blow from west to east, British entrepôt trade suffered. External debts forced Said Pasha’s successor, Isma’il Pasha, to sell his country’s share in the canal for £4,000,000 (about £85.9 million in 2014) to the United Kingdom in 1875, but French shareholders still held the majority. Prime Minister Benjamin Disraeli was accused by William Ewart Gladstone of undermining Britain’s constitutional system, because he had not referred to, or obtained consent from Parliament when purchasing the shares with funding from the Rothschilds. When it opened, the Suez Canal was only 25 feet deep, 72 feet wide at the bottom, and 200 to 300 feet wide at the surface. Consequently, fewer than 500 ships navigated it in its first full year of operation. Major improvements began in 1876, however, and the canal soon grew into the one of the world’s most heavily traveled shipping lanes [12]. In 1875, Great Britain became the largest shareholder in the Suez Canal Company when it bought up the stock of the new Ottoman governor of Egypt. Seven years later, in 1882, Britain invaded Egypt, beginning a long occupation of the country. The Anglo-Egyptian treaty of
1936 made Egypt virtually independent, but Britain reserved rights for the protection of the canal. 8. Britain Gain Control in 1882. The Convention of Constantinople in 1888 declared the canal a neutral zone under the protection of the British, who had occupied Egypt and Sudan at the request of Khedive Tewfiq to suppress the Urabi Revolt against his rule. The revolt went on from 1879 to 1882. As a result of British involvement on the side of Khedive Tewfiq, Britain gained control of the canal in 1882. The British defended the strategically important passage against a major Ottoman attack in 1915, during the First World War [12]. Under the Anglo-Egyptian Treaty of 1936, the British retained control over the canal. In 1951 Egypt repudiated the treaty, and in October 1954 the British agreed to remove its troops. Withdrawal was completed on 18 July 1956. [Figure 3]

Cold War-Era Crisis

In 1956, the Suez Canal was at the center of a brief war between Egypt and the combined forces of Britain, France and Israel. The conflict had its origins in Britain’s military occupation of the Canal Zone, which had continued even after Egypt gained independence in 1922. Many Egyptians resented the lingering colonial influence, and tensions finally boiled over in 1956. Egypt pressed for evacuation of British troops from the Suez Canal Zone, and in October 1954 the British agreed to remove its troops. Withdrawal was completed on 18 July 1956. [Figure 3]

Nasser nationalized the canal, hoping to charge tolls that would pay for construction of a massive dam on the Nile River [29]. In response, Israel invaded in late October, and British and French troops landed in early November, occupying the Canal Zone [14]. Under pressure from the United Nations, Britain and France withdrew in December; and Israeli forces departed in March 1957. That month, Egypt took control of the canal and reopened it to commercial shipping. [Figure 4]

Arab-Israel Crisis and Yellow Fleet

During June 1967’s Six Day War between Egypt and Israel, the Suez Canal was shut down by the Egyptian government and blocked on either side by mines and scuttled ships. At the time of the closure, 15 international shipping vessels were moored at the canal’s midpoint at the Great Bitter Lake. They would remain stranded in the waterway for eight years, eventually earning the nickname the “Yellow Fleet” for the desert sands that caked their decks. Most of the crewmembers were rotated on and off the stranded vessels on 3-month assignments, but the rest passed the time by forming their own floating community and hosting sporting and social events [15]. As the years passed, the fleet even developed its own stamps and internal system of trade. The 15 marooned ships were finally allowed to leave the canal in 1975. By then, only two of the vessels were still seaworthy enough to make the voyage under their own power. [Figure 5]
Geology

The Isthmus of Suez, the sole land bridge between the continents of Africa and Asia, is of relatively recent geologic origin. Both continents once formed a single large continental mass, but during the Paleogene and Neogene periods (about 66 to 2.6 million years ago) the great fault structures of the Red Sea and Gulf of Aqaba developed, with the opening and subsequent drowning of the Red Sea trough as far as the Gulf of Suez and the Gulf of Aqaba. In the succeeding Quaternary Period (about the past 2.6 million years), there was considerable oscillation of sea level, leading finally to the emergence of a low-lying isthmus that broadened northward to a low-lying open coastal plain [31]. There the Nile delta once extended farther east-as a result of periods of abundant rainfall coincident with the Pleistocene Epoch (2,588,000 to 11,700 years ago)-and two river arms, or distributaries, formerly crossed the northern isthmus, one branch reaching the Mediterranean Sea at the narrowest point of the isthmus and the other entering the sea some 9 miles (14.5 km) east of present Port Said [16].

Physiography

Topographically, the Isthmus of Suez is not uniform. There are three shallow water-filled depressions: Lake Manzala, Lake Timsah, and the Bitter Lakes; though distinguished as Great and Little, the Bitter Lakes form one continuous sheet of water. A number of more-resistant bands of limestone and gypsum obtrude in the south of the isthmus, and another significant feature is a narrow valley leading from Lake Timsah southwestward toward the middle Nile delta and Cairo. The isthmus is composed of marine sediments, coarser sands, and gravels deposited in the early periods of abundant rainfall, Nile alluvium (especially to the north), and windblown sands.

Canal Construction

When first opened in 1869, the canal consisted of a channel barely 8 meters deep, 22 meters wide at the bottom, and 61 to 91 meters wide at the surface. To allow ships to pass each other, passing bays were built every 8 to 10 km. Construction involved the excavation and dredging of 74 million cubic meters of sediments. Between 1870 and 1894 some 3,000 groundings of ships occurred because of the narrowness and tortuosity of the channel [17]. Major improvements began in 1876 and, after successive widening and deepening, the canal by the 1960s had a minimum width of 55 meters at a depth of 10 meters along its banks and a channel depth of 12 meters at low tide. Also in that period, passing bays were greatly enlarged and new bays constructed, bypasses were made in the Bitter Lakes and at Al-Ballāḥ, stone or cement cladding and steel piling for bank protection were almost entirely completed in areas particularly liable to erosion, tanker anchorages were deepened in Lake Timsah, and new berths were dug at Port Said to facilitate the grouping of ships in convoy. Plans that had been made in 1964 for further enlargement were overtaken by the Arab-Israeli war of June 1967, during which the canal was blocked. The canal remained inoperative until June 1975, when it was reopened and improvements were recommenced. In 2014 the Egyptian government announced plans for a nearly US$ 8.5 billion project to upgrade the canal and significantly increase its capacity [18]. Included in the project is a second lane to allow ships to pass north and south concurrently, expected to be completed at end of 2015.

Economy

In 1870, the canal’s first full year of operation, there were 486 transits, or fewer than 2 per day. In 1966 there were 21,250, an average of 58 per day, with net tonnage increasing from some 444,000 metric tons in 1870 to about 278,400,000 metric tons. By the mid-1980s the number of daily transits had fallen to an average of 50, but net annual tonnage was about 355,600,000 metric tons [20]. In 2014 there were 17,148 transits with a net annual tonnage of about 963,000,000 metric tons.[Figure 6]
Convoy Sailing

Since the canal does not cater for unregulated two-way traffic, all ships transit in convoys on regular times, scheduled on a 24-hour basis. Each day a single northbound convoy starts at 06.00 from Suez, getting an unhindered passage. At by-passes, the convoy uses the eastern route. Interwoven in this convoy’s passage are two southbound convoys. The first starts at 0.00 from Port Said, and anchors in the Great Bitter Lake to let the northbound pass; the second starts at 07.00 and anchors in the western Ballah by-pass to let the northbound convoy pass. Due to the Ballah canal dimensions; this convoy is restricted to smaller and often unloaded ships.

Operation

The canal does not permit two-way traffic. Originally, ships would stop in a passing bay to allow the passage of ships in the other direction. Transit time then averaged 40 hours, but by 1939 it had been reduced to 13 hours. A system of convoys was adopted in 1947, consisting of one northbound and two southbound per day [29]. Transit time went up to 15 hours in 1967 despite convoying, reflecting the great growth in tanker traffic at that time [19]. With some enlargement of the canal, transit time since 1975 has ranged from 11 to 16 hours. Upon entering the canal at Port Said or Suez, ships are assessed for tonnage and cargo (passengers have ridden without charge since 1950) and are handled by one or two pilots for actual canal transit, which is increasingly controlled by radar. Southbound convoys moor at Port Said, Al-Ballāh, Lake Timsah, and Al-Kabīrīt, where there are bypasses that allow northbound convoys to proceed without stopping. The nature of traffic has greatly altered, especially because of the enormous growth in shipments of crude oil and petroleum products from the Persian Gulf since 1950. In 1913 the oil in northbound traffic amounted to 291,000 long tons (295,700 metric tons), whereas in 1966 it amounted to 166,000,000 long tons (168,700,000 metric tons). The closure of the canal from 1967 to 1975 led to the use of large oil tankers on the route around the Cape of Good Hope and prompted the development of the Sumed pipeline from Suez to Alexandria, which opened in 1977. Since 1975 the increased size of tankers—the largest of which cannot use the canal—and the development of sources of crude oil in areas outside of the canal route (e.g., Algeria, Libya, Nigeria, the North Sea, and Mexico) have reduced the canal’s importance in the international oil trade [21]. From an all-time peak of 984,000 in 1945, passenger traffic has declined to negligible numbers because of the competition from aircraft. Further decline in canal traffic resulted from a shift of Australasian trade from Europe to Japan and East Asia. Some movement of oil, however, from refineries in Russia, southern Europe, and Algeria has continued, chiefly to India, and the shipment of dry cargoes, including grain, ores, and metals, has increased. A more recent feature has been the growth of container and roll-on/roll-off (ro-ro) traffic through the canal, chiefly destined for the highly congested ports of the Red Sea and Persian Gulf [22]. The major northbound cargoes consist of crude petroleum and petroleum products, coal, ores and metals, and fabricated metals, as well as wood, oilseeds and oilseed cake, and cereals. Southbound traffic consists of cement, fertilizers, fabricated metals, cereals, and empty oil tankers.

Navigation

The canal has no locks because of the flat terrain, and the minor sea level difference between each end is inconsequential for shipping. As the canal has no sea surge gates, the ports at the ends would be subject to the sudden impact of tsunamis from the Mediterranean Sea and Red Sea, according to a 2012 article in the Journal of Coastal Research. There is one shipping lane with passing areas in Ballah-Bypass near El Qantara and in the Great Bitter Lake. On a typical day, three convoys transit the canal, two southbound and one northbound. The passage takes between 11 and 16 hours at a speed of around 8 knots (15 km/h; 9 mph). The low speed helps prevent erosion of the banks by ships’ wakes. New Rules of Navigation came into force on 1 January 2008, passed by the board of directors of the Suez Canal Authority (SCA) to organize vessels’ transit. The most important amendments include allowing vessels with 62-foot (19 m) draught to pass, increasing the allowed breadth from 32

Figure 7: American aircraft carrier and an Egyptian Submarine in the Suez Canal.
meters (105 ft) to 40 meters (130 ft) (following improvement operations), and imposing a fine on vessels using divers from outside the SCA inside the canal boundaries without permission [23]. The amendments allow vessels loaded with dangerous cargo (such as radioactive or flammable materials) to pass if they conform to the latest amendments provided by international conventions. The SCA has the right to determine the number of tugs required to assist warships traversing the canal, to achieve the highest degree of safety during transit. [Figure 7].

**Interesting Fact and Features**

- **Canal Length:** 120.11 miles or 193.30 km (originally 102 nm or 164 km)
- **Maximum boat beam:** 77.5 m (254 ft 3 in)
- **Locks:** None
- **Original Owner:** Suez Canal Company (Compagnie Universelle du Canal Maritime de Suez, French)
- **Construction began:** April 1859, 25
- **Date completed:** November 17, 1869
- **Start point:** Port Said
- **End point:** Port Tewfik, Suez
- **Branch(es):** The New Suez Canal.

**Digging Sand Remove**

Of the 75 million cubic meters of sand eventually moved during the construction of the main canal, some three-fourths of it was handled by heavy machinery.

**Suezmax**

The canal allows passage of ships up to 20 m (66 ft) draft or 240,000 deadweight tons and up to a height of 68 m (223 ft) above water level and a maximum beam of 77.5 m (254 ft) under certain conditions.

**Traffic**

The canal can handle more traffic and larger ships than the Panama Canal. Some supertankers are too large to traverse the canal. Others can offload part of their cargo onto a canal-owned boat to reduce their draft, transit, and reload at the other end of the canal.

**Alternative Sea Route**

The main alternative sea route rather than Suez Canal is around Cape Agulhas, the southernmost point of Africa, commonly referred as the Cape of Good Hope route. This was the only sea route before the canal was constructed, and when the canal was closed [24]. It is still the only route for ships that are too large for the canal.

**Piracy Problem**

In the early 21st century the long route has enjoyed increased popularity because of increasing piracy in Somalia. Between 2008 and 2010, it is estimated that the canal lost 10% of traffic due to the threat of piracy, and another 10% due to the financial crisis.

**Reduce Distance**

An oil tanker going from Saudi Arabia to the United States has 2,700 nm (4,345 km) longer to go when taking the route south of Africa rather than the canal.

**Before Canal**

Before the canal’s opening in 1869, goods were sometimes offloaded from ships and carried overland between the Mediterranean and the Red Sea.

**The Suez Canal Bridge**

Also called the Egyptian-Japanese Friendship Bridge, a high-level road bridge at El Qantara. In Arabic, al qantara means “arch”. It has a 70-metre (230 ft) clearance over the canal and was built with assistance from the Japanese government and by Kajima.

**El Ferdan Railway Bridge**

20 km (12 mi) north of Ismailia was completed in 2001 and is the longest swing span bridge in the world, with a span of 340 m (1100 ft) [29]. The previous bridge was destroyed in 1967 during the Arab-Israeli conflict.

**Fresh Water Supply**

Pipelines taking fresh water under the canal to Sinai, about 57 km (35 mi) north of Suez.

**Ahmed Hamdi Tunnel**

South of the Great Bitter Lake was built in 1983. Because of leakage problems, a new water-tight tunnel was built inside the old one from 1992 to 1995.

**Overhead Power Line**

The Suez Canal overhead power-line crossing was built in 1999.

**Railway**

A railway on the west bank runs parallel to the canal for its entire length.

**Sea Route**

A graphical comparison between the Northern Sea Route (blue) and an alternative route through Suez Canal (red).

**First Open Operation**

When it opened, the Suez Canal was only 25 feet deep, 72 feet wide at the bottom, and 200 to 300 feet wide at the surface. Consequently, fewer than 500 ships navigated it in its first full year of operation [25].

**World Sea Trade**

By 1955 about two-thirds of Europe’s oil passed through the
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around 8% of world sea trade is carried via the canal.

Vessel Crossing Annually

In 2008, 21,415 vessels passed through the canal.

Average Cost Per Ship

The average cost per ship is US $251,000. In 2008, the receipts totaled US $5.381 billion.

Transit Time

Typically it takes a ship 12 to 16 hours to transit the canal.

Daily Capacity

The canal’s 24-hour capacity is about 76 standard ships.

First President of the Suez Canal Company

Ferdinand de Lesseps (15 December 1858 – 7 December 1894).

Present Chairmen of the Suez Canal Authority

Admiral Mohab Mamish (2012 - present).[Figure 8].

Figure 8: A high-level road bridge on Suez Canal and a Container-ship crossing the Suez Canal.

Important Timelines

- 25 April 1859- Construction officially starts by French Private Company (Owner name was Ferdinand Marie de Lesseps).
- 17 November 1869- The canal is opened, owned and operated by Suez Canal Company.
- 18 December 1873- The International Commission of Constantinople establishes the Suez Canal Net Ton and the Suez Canal Special Tonnage Certificate (as known today)
- 25 November 1875- Britain becomes a minority share holder in the company, acquiring 44%, with the remainder being controlled by French business syndicates.
- 20 May 1882- Britain invades Egypt, with French assistance, and begins its occupation of Egypt [26].
- 25 August 1882- Britain takes control of the canal.
- 2 March 1888- The Convention of Constantinople renews the guaranteed rite of passage of all ships through the canal during war and peace; these rights were already part of the licenses awarded to de Lesseps, but are recognised as international law.
- 14 November 1936- Following a new treaty, Britain theoretically pulls out of Egypt, but establishes the ‘Suez Canal Zone’ under its control [29].
- 13 June 1956- Suez Canal Zone is restored to Egyptian sovereignty, following British withdrawal and years of negotiations.
- 26 July 1956- Egypt nationalizes the company; its Egyptian assets, rights and obligations are transferred to the Suez Canal Authority, which compensates the previous owners at the established pre-nationalization price. Egypt closes the canal to Israeli shipping as part of a broader blockade involving the Straits of Tiran and the Gulf of Aqaba.
- 31 October 1956 to 24 April 1957- the canal is blocked to shipping following the Suez Crisis, a conflict that leads to Israeli, and later French and British, occupation of the Canal Zone [26].
- 22 December 1956 – The Canal Zone is restored to Egyptian control, following French and British withdrawal, and the landing of UNEF troops.
- 5 June 1967 to 10 June 1975- the canal is blocked by Egypt, following the war with Israel; it becomes the front line during the ensuing War of Attrition and the 1973 war, remaining closed to international shipping, until general agreement was near.
- 1 January 2008- New rules of navigation passed by the Suez Canal Authority come into force.
Ecological Balance of Two Seas

The opening of the canal created the first salt-water passage between the Mediterranean and the Red Sea. Although the Red Sea is about 1.2 m (4 ft) higher than the eastern Mediterranean, the current between the Mediterranean and the middle of the canal at the Bitter Lakes flows north in winter and south in summer. The current south of the Bitter Lakes is tidal, varying with the tide at Suez [23]. The Bitter Lakes, which were hyper saline natural lakes, blocked the migration of Red Sea species into the Mediterranean for many decades, but as the salinity of the lakes gradually equalized with that of the Red Sea the barrier to migration was removed, and plants and animals from the Red Sea have begun to colonies the eastern Mediterranean.

Future Expansion of Canal

The Suez Canal has enjoyed increased traffic in recent years, with roughly 50 ships passing through its waters every day. Shipping tolls allow Egypt to rake in around $ 5 billion annually, but the canal is still hampered by its narrow width and shallow depth, which are insufficient to accommodate two-way traffic from modern tanker ships. In August 2014, Egypt’s Suez Canal Authority announced an ambitious plan to deepen the canal and create a new 22-mile lane branching off the main channel. Preliminary work has already begun on the US $ 8.5 billion project, which Egyptian authorities claim could more than double the canal’s annual revenue by 2023 [28].[Figure 9]

Northern Sea Route as New Advatnure

In recent years, the shrinking Arctic sea ice has made the Northern Sea Route feasible for commercial cargo ships between Europe and East Asia during a six-to-eight-week window in the summer months, shortening the voyage by thousands of miles compared to that through the Suez Canal. According to polar climate researchers, as the extent of the Arctic summer ice pack recedes the route will become passable without the help of icebreakers for a greater period each summer. The Bremen-based Beluga Group claimed in 2009 to be the first Western company to attempt using the Northern Sea Route without assistance from icebreakers, cutting 4000 nautical miles off the journey between Ulsan, Korea and Rotterdam, the Netherlands [30].

Conclusion

Suez Canal is a sea-level waterway running north-south across the Isthmus of Suez in Egypt to connect the Mediterranean and the Red seas. The canal separates the African continent from Asia, and it provides the shortest maritime route between Europe and the lands lying around the Indian and western Pacific oceans. It is one of the world’s most heavily used shipping lanes (handle more than 8% of world shipping traffic). The canal extends 101 nm (163 km) between Port Said in the north and Suez in the south, with dredged approach channels north of Port Said, into the Mediterranean, and south of Suez. The canal does not take the shortest route across the isthmus, which is only 75 nm (121 km). Instead, it utilizes several lakes: from north to south, Lake Manzala, Lake Timsah, the Great Bitter Lake and Little Bitter Lake. The Suez Canal is an open cut, without locks, and, though extensive straight lengths occur; there are eight major bends. To the west of the canal is the low-lying delta of the Nile River, and to the east is the higher, rugged, and arid Sinai Peninsula. Today, more than 50 ships navigate the canal daily, carrying more than 900 million tons of goods a year and collect more than US $ 5 billion annually [26]. Prior to construction of the canal (completed in 1869), the only important settlement was Suez, which in 1859 had 3,000 to 4,000 inhabitants. The rest of the towns along its banks have grown up since, that time. In August 2014, Egypt’s Suez Canal Authority announced an ambitious plan to deepen the canal and create a new 22-mile lane branching off the main channel and which could allow second lane to ships convoy to pass north and south concurrently and more than double the canal’s annual revenue by 2023. However; Suez Canal is one the greatest modern maritime wonder of the world

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