

**The Bosphorus: Environment vs. Economy**

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## *Introduction*

Turkey's Bosphorus is the most congested, dangerous, and valuable strait in the world. It is the gateway for oil and chemicals produced in Russia and other Eastern European nations. With increased tanker traffic due to growing Caspian Sea exports, accidents and congestion within the Bosphorus will only multiply. As Caspian Sea states begin exporting oil, several countries have seized the opportunity and built pipelines to speed export and benefit economically from improved oil flow and pipeline usage.

Turkey has built a major pipeline from the Caspian Sea to its port in Ceyhan on Mediterranean Sea. Since the only other major export route involves Russian tankers passing through the Bosphorus, any regulation of the Bosphorus will slow such export and make the Turkish route preferred. It is of no coincidence then that Turkey has recently begun pushing for restricting Bosphorus usage, citing environmental concerns. Are the environmental concerns valid or are they being used to support Turkey's economic agenda?

## *The Bosphorus: Description*



**Figure 1: The Bosphorus**

The 19 mile long Bosphorus is the dividing line between Asia and Europe. Splitting the city of Istanbul into two, it also connects the Black sea to the Mediterranean sea and the rest of the worlds oceans. At its widest, the strait spans 2.3 miles<sup>1</sup>; but at its narrowest, it is only half a mile wide. Over 50,000 ships pass through the Bosphorus yearly, ten percent of which are oil tankers. The Bosphorus is by far the worlds most crowded waterway, three times as busy as the Suez canal. Historically one of the most dangerous and catastrophic waterways, the strait is narrow, winding, and has a very rapid current. Due to the high traffic and dangerous passage, nearly ten ships a year fall victim to the strait and either ground themselves or collide.

## Turkey: Description



**Figure 2: Turkey Country Map**

Turkey, occupying over 300,000 square miles, is the largest European state. Additionally, it spans the dividing line between the European and Asian continents. Bordered by both the Black Sea and the Mediterranean Sea, it serves as portal for Russian and European goods to travel to worldwide markets. Istanbul, Turkey's most prominent port city, is home to 12 million residents, all densely packed on either side of the Bosphorus strait.

A member of the UN and NATO, Turkey is looking to become a member of the European Union. In order to become a member, Turkey is expected to have a solid economy and a healthy environmental record. After nearly ten years of economic

growth, Turkey began to suffer in 2001 as a financial crisis caused the devaluation of the lira. Additionally, clashes between the national army and ethnic Kurds have raised questions about Turkey’s human rights record. Finally, Turkey’s environmental record is also under fire as increased industrialization has degraded the air quality of many major cities. More importantly, the marine environment, particularly around the Bosphorus, is in utmost danger.

*The Bosphorus Environmental Issues*

As mentioned previously, Turkey’s concerns about the Bosphorus environment stem from standards needed for EU consideration as well as concerns for the overall health and well being of Istanbul and its 12 million residents.

The table below shows the total shipping traffic and casualty report for 1995-2000. The “used pilot” column denotes the number of ships who chose to hire a local pilot for the passage. The huge number of ships passing through the 19-mile strait results in approximately one ship every 10 minutes. Casualty statistics are increasing yearly, but are nowhere near the 1991 high of 49 broken or destroyed ships. The 16 casualties may seem small in comparison to the almost 50,000 ships passing through each year, but it is important to put that number in perspective. Each casualty has the potential to cause catastrophic harm to Istanbul, its people, and the environment.

YEAR	Total	Used Pilot	>200m.	Tankers	Casualties
1995	46954	17772	6491	-	4
1996	49952	20317	7236	4248	7
1997	50942	19752	6487	4303	11
1998	49304	18881	1943	5142	11
1999	47906	18424	2168	4452	16
2000	48079	19209	2203	4937	-

### **Figure 3: Table of Ship Traffic and Casualty Statistics**

While the number of accidents within the Bosphorus raises concern about its safety, the gravity of a few show the possible magnitude of damage that a ship casualty could cause. Dangers to the Bosphorus can be grouped into the following three categories: shoreline destruction, loss of life, and pollution.

Since the Bosphorus is less than half a mile wide at its narrowest point, ships often pass within hailing distance of shore. The combination of dangerous currents and widely varying water depth has led to many ships running aground and destroying shoreline homes and businesses.

Many sailors lose their lives in passing through the Bosphorus. In the descriptions noted below, oil tanker casualties also resulted in the death of many seamen. From 1982-1994, 47 sailors have died in a total of 208 incidents.

The most major source of environmental concern is pollution. A short list from the Turkish Maritime Pilots' Association:

- M/T Independenta, Romanian flag and freighter M/V Evriyali, Greek flag, collided on 15 November 1979. Almost all of the crew of the Romanian tanker, 43 crew members lost their lives, (only 3 survived). Collision caused fire and agrounded tanker's wreck affected the area for some years.
- Ammoniac loaded tanker M/T Blue Star, Panama flag, collided with a Turkish Crude Oil Carrier M/T Gaziantep, which was on anchor, on 28 October 1988, Huge quantities of ammoniac cargo polluted the environment.
- M/T Jambur, Iraqi flag and M/V Datton Shang, Chinese flag bulk carrier, collided on 29 March 1990 Thousands of tons of petroleum severely polluted the whole Strait and cleaning operations were carried out for weeks.
- M/V Madonna Lily, Philippines flag bulk carrier and M/V Rabunion 18, Lebanese flag live stock carrier, collided on 14 November 1991. Rabunion 18 sank with her cargo, 21,000 sheep.
- M/T Nassia, and bulk carrier M/V Shipbroker, both South Cyprus flag, collided on 13 March 1994. Totally 29 officers and crew members of both ships lost their lives, including the master of Shipbroker, which burnt totally and fire on Nassia, affected the Strait and the environment. Approximately 20000 MIT crude oil a considerable part of Nassia's cargo - caused severe pollution and fire which lasted

4 days 5 hours 40 minutes and consequently suspended traffic in the Strait for several days

Casualties in the Bosphorus would be less of an issue if they involved less hazardous cargo. Twenty billion gallons of oil and chemicals are transported through the straits and nearly one out of every ten ships making the passage is carrying highly polluting cargo.

The images below show accidents that have occurred in the strait. The last image, of the *Nassia*, represents the most recent catastrophe which eventually led to the most significant legislation on passage restriction ever.



Pinelopi-A, crashed into Kadripasha Palace, 1981<sup>2</sup>



M/T INDEPENDENTA Under fire after collision, 1979<sup>2</sup>



©Robert Wallis

M/T NASSIA under fire after accident, 1994<sup>3</sup>

#### Figure 4: Major Casualties

Beyond accidents and their inevitable pollution, the constant passage of ships is also harming the environment through ballast release. As ships pump out their holds, contaminated water is emptied into the strait, causing a reduction in fishing to 1/60<sup>th</sup> of previous numbers. Foreign organisms such as the comb jelly transported to the Black sea by these ships threaten the natural ecology of the region. Since the comb jelly has no predators in the area, it destroyed fish in the Black sea much faster than the already over-harvesting commercial fisheries. In addition to organic pollution, ships also release oil and chemicals with their ballast, contributing to the polluted nature of the strait.



Until now, Istanbul and the Bosphorus have remained relatively safe. Catastrophic collisions have occurred far enough from shore to keep the city from catching fire, and the more dangerous chemicals and nuclear waste have yet to be accidentally released into the water. However, the danger of an Exxon *Valdez*-like spill is ever-present, especially as tankers increase in number and size. Larger tankers are more prone to accident as they are in more danger of running aground and cannot react quickly. Additionally, their larger size makes an accident ever more catastrophic. The *Volgoneft-248* ran aground and spilled 800 tons of fuel oil into the sea, covering 5 square miles of water and the entire coast of Marmara.

#### *Legislation Governing the Bosphorus*

The Bosphorus is governed almost completely by the Treaty of Montreaux. “The Treaty guarantees Turkey’s sovereignty, but states that in peacetime, vessels of any nation carrying any cargo may pass freely without delay or regulation through the Straits”<sup>4</sup>. Signed in 1936, the treaty was passed before the invention of supertankers, when typical cargo consisted of grain as opposed to the nuclear waste, oil and chemicals of today. In 1936, 17 ships of 13 tons each passed daily, whereas today, on average 1,350 ships pass through the strait, the largest carrying 200,000 tons<sup>5</sup>.

Turkey responded to the *Nassia* accident by imposing new legislation in 1994. While in clear opposition to Montreaux, Turkey argued that safety and environmental dangers justified the new regulations. The provisions were as follows:

1. vessels longer than 150 meters (164 yards) are advised to take pilot captains  
And guiding tugs
2. automatic pilots for navigation are prohibited

3. ships powered by nuclear energy, or carrying nuclear or other hazardous materials must report to Turkish Environment Ministry for permission
4. ship height is limited to 190 feet
5. new traffic lanes to be set, new traffic separation schemes (TSS) are implemented
6. no more than a single vessel carrying materials deemed hazardous will be allowed to pass at the same time
7. all ships must notify Turkish authorities 24 hours in advance of intention to pass through straits
8. ships longer than 200 meters can pass only in daytime
9. passage requires favorable weather

Upon ratification by the IMO (International Maritime Organization), the provisions were pared down to “an overall speed limit of ten knots, the restriction of ships longer than 200 meters to daylight crossings only, and the reduction of traffic to one lane when ships over 250 meters in length are in the strait. The strait also closes to all other traffic when ships over 300 meters in length (or tankers of 100,000 tons or greater) pass through its waters”<sup>6</sup> However, even with IMO approval, the new legislation is still in opposition to the Montreaux convention. Russia, representing 25% of the traffic through the strait, immediately challenged the provisions, saying that they “delay and regulate” the passage of vessels. Additionally, Russia alleged that the new rules were economically and politically based as opposed to being simply environmentally based as assured by the Turks. In the end, Turkey has little control over the Bosphorus, but can assert those laws under IMO approval, much to the disdain of captains and owners.

In 1994 the United Nations established a series of rules based upon the 1994 IMO approved provisions. The laws established basic features required of ships transiting the strait. Additionally, the treaty limits speed to 10 NM/hr and standardizes the distance between vessels. Ships carrying toxic waste or dangerous cargo must receive clearance from the Under-secretariat for Maritime Affairs and may only enter the Bosphorus one at a

time. The treaty goes on to mandate that Turkish vessels must use a pilot, whereas foreign vessels are merely advised to do the same. The laws also take adverse weather conditions into account, saying that at high current or low visibility, large vessels must not enter the strait.<sup>7</sup>

In addition to international shipping and waterway laws, the Bosphorus is also regulated under the Bucharest Convention on the Protection of the Black Sea Against Pollution. This convention, signed in April 1992 by the Black Sea states, is a pledge by all the states to act jointly in preservation of the Black Sea. It sets up a commission that will create criteria for understanding pollution and suggest methods for rectifying the problems.<sup>8</sup> Building upon the Bucharest Convention, the Odessa Ministerial Declaration on the Protection of the Black Sea creates a detailed list of anti-pollution controls such as the banning of radioactive dumping, the set up of national and regional contingency plans for a pollution emergency, and a compulsory environmental impact assessment among others<sup>9</sup>.

#### *Environmental and Waterway Control*

As the Bosphorus and Istanbul are in danger of disastrous pollution should a large collision occur, it is important to discuss possible options for lessening the chances of such a collision. The most beneficial addition to any tanker passing through the strait is a pilot. The Turkish government encourages ships to hire a local pilot to navigate the strait. The Turkish pilots association provides the following statement:

As it is stated by the International Maritime Organization IMO documents, the share of human error in the sea accidents is approximately 85-86%. Consequently the marine pilots have proved themselves as the highly experienced fundamental elements in provision of life, property and environmental safety in a particular area, since they are trained for a certain region and eventually are aware of the entire local peculiarities and do the same work everyday repeatedly. The share of the human error in the sea accidents drops down to almost zero, as an outcome of the pilotage services, if they are carried out within an well-organized system. <sup>10</sup>

While it is clearly in the pilots' best interest to prove their own necessity, statistics regarding collision with and without pilotage tend to support their conclusions. The 63% of ships refusing to hire a pilot had 85% of the accidents from 1982-1995. Hence, it is to their advantage to hire a pilot as it would tend to reduce their chances of having an accident. Turkey requires its own ships to hire a pilot, but stops short of doing so for all traffic as that legislation would be a hindrance to free passage through an international waterway.

It is in the pilotage issue that Turkey's political agenda must be brought to light. Since pilots do improve the safety of transit through the strait, it seems reasonable that Turkey would push to require that all ships take on a pilot. While the Montreaux convention denies this as it would inhibit the promised free and uncompromised passage, the UN and the International Maritime organization have the influence to create new legislation in this regard. However, the pilot requirement offers a greater benefit to Turkey than simply environmental security. Since pilotage of the Bosphorus is a regulated

monopoly, the nation could control passage of ships through the strait by adjusting the price accordingly. Effectively creating a tariff system, the pilotage requirement's effect on traffic is far larger than its slight improvement in safety.

Of crucial consideration is the point that pilotage through Turkey is not a competitive medium. This puts the shipping traffic directly under government control. If pilots were to be required, it would seem a proper compromise then to allow free competition among private pilotage companies. However, competition in pilotage is not allowed in either the EU or the US. Since the purpose of pilotage is to provide safe and regulated passage through the waterway, the presence of competing services inevitably leads to disarray and reduced quality.

While Turkey's 1994 legislation was effectively quashed by international law, some regulation of the Bosphorus has been allowed. Turkey can shut down traffic in one direction for a tanker over 216 yards long, however this backs up traffic at the mouth of the strait. At times, Turkey has outright broken the Montreaux convention. "Turkey sparked an international incident in August when it held up a 341-yard-long ship carrying iron ore to steel mills in Romania and Serbia. Eventually, Turkish authorities allowed it to pass--with the help of five tugboats, a fireboat, a local pilot and a \$1 million safety deposit. But controls that stringent are rare."<sup>11</sup>

In addition to encouraging pilotage, Turkey is also investing in a radar traffic control system. The \$20 million system, built by Lockheed Martin Corp. uses radar and satellites to improve navigation safety and emergency response<sup>5</sup>. The monitoring system will also be invaluable in documenting the passage of ships and various violations of

passage rules or pollution. The system is expected to be operational by the end of the year.

### *Political Issues*

The environmental impact of tanker traffic through the Bosphorus must not only be assessed for the present situation, but must also take into consideration future oil transport. Presently, the majority of oil passing through the strait is of Russian origin. However, the Caspian Sea oil reserves are just now being explored and hold great promise as one of the last untapped fossil fuel resources. As the countries surrounding the Caspian Sea begin to exploit the 233 billion barrels of possible oil in the Sea, transport of their oil raises more issues for the Bosphorus.

Currently, the five states surrounding the Caspian Sea (Azerbaijan, Iran, Kazakhstan, Russia, and Turkmenistan) are producing approximately 1130 kBL/d; however, it is estimated that by 2010, they will be producing over three times that amount. As production ramps up, these countries are working to solidify transport routes to world markets. Since the southern market is well supplied by middle-eastern countries, the Caspian Sea states look to the northwest for customers. Several export options are being explored, but two have emerged as the major routes.



**Figure 5: Caspian Sea Export Options**

The Baku-Ceyhan pipeline, heavily supported by the United States, will pass through Azerbaijan, Georgia, and Turkey. Starting in Azerbaijan and ending at the Mediterranean sea, it has the benefit of requiring no passage through the Bosphorus, already a choke point for transport. Having a capacity of 1 million bbl/d and stretching over 1000 miles, the pipeline is extremely expensive, and construction has been funded mostly by the United States. Costing nearly \$2.9 billion<sup>12</sup>, both nations look for increased oil flow to recoup their initial investment. Turkey firmly supports this option as it brings oil through Turkish territory yet does not require use of the Bosphorus. Turkey cannot regulate or tax traffic through the Bosphorus, yet it has free reign over pipelines traveling overland. Thus, the pipeline is economically very attractive.

The other possible export option is a northern route through Russia ending in Novorossiysk on the Black Sea. This option is much simpler and inexpensive as it connects to existing Russian pipelines. However, all northern routes must eventually

transit the Bosphorus. If Caspian oil were to take the northern route, it is estimated that traffic through the strait would increase three-fold to nearly 150,000 ships a year.

It is the two pipelines that form the basis for the dispute over Turkey's environmental plight. If Turkey can convince the world (the UN) that an impending environmental catastrophe can be averted if it is allowed to regulate tanker traffic, the Baku-Ceyhan pipeline will immediately become more attractive and profitable. Additionally, Turkey will gain revenue and a more powerful world stature with Bosphorus regulation. Hence, it is clearly in Turkey's best interest to use the environmental issues to improve its economic situation.

Russia on the other hand, stands to lose immensely if the Bosphorus is regulated. As the second largest producer of oil, Russia depends on oil export for much of its economic stability. However, the vast majority of Russian oil exits through the Bosphorus to reach world markets. If Turkey is allowed to regulate this chokepoint, Russian exports will slow significantly and Russia will have to invest in costly new pipelines to bring its goods to market. Presently, only the Baltic Pipeline System can transport Russian oil without transiting the Black Sea; however, Russia has also explored pipelines to China or a possible terminal at Murmansk.

Finally, even though Turkey has no authority to regulate the Bosphorus, many Caspian states are considering Bosphorus bypass options in order to bring oil to Europe. Ukraine has constructed the Odessa-Brody pipeline to bypass the Bosphorus for a variety of reasons. First, any route transiting the Bosphorus must use small LR-2 tankers rather than the VLCCs (Very Large Crude Carriers) built for ocean travel. Secondly, as the Bosphorus becomes more congested with tankers, it will become less profitable as the



accident rate will inevitably rise and transit times increase. The tanker size differential lends greater economic feasibility to the Baku-Ceyhan route over the Novorossiysk option. Shipping to Rotterdam via LR-2 costs \$1.23 per barrel while the same route for a VLCC costs \$0.76 per barrel<sup>6</sup>. Offsetting the cost of the tankers, the Russian pipeline is significantly cheaper, so the Novorossiysk route is actually cheaper at \$2.25 per barrel compared to \$3.02 for the Baku-Ceyhan option<sup>6</sup>.

### *Analysis*

The Bosphorus is undeniably the most dangerous waterway on Earth. As tanker traffic increases, so does the probability that a major tanker accident will occur and irreparably damage the Bosphorus and Istanbul. Thus, Turkey's imposition of new passage restrictions is understandable. However, Turkey also stands to benefit economically as restricted passage leads to more Caspian oil flowing through the Turkish pipeline. That the new restrictions have been imposed within a year of the pipeline's completion is enough to question the motives of the legislation.

States from the Caspian Sea region claim that Turkey's restrictions have no environmental basis and that congestion in the Bosphorus will be no worse when Caspian oil is being exported. Additionally, increased traffic flow figures assume that all Caspian oil will be sent to Europe and the United States; conversely, if the oil was exported to Asia, it would be sent south to the Suez Canal. Since Asia (China and Japan) is forecasted to be one of the largest consumers of oil in the coming decade, it is not unlikely that a large percentage of Caspian oil will be transported in that direction. So, Turkey's estimates of increased tanker traffic may very well be greatly exaggerated.

If a greater number of tankers were to flow through the Bosphorus unrestricted, congestion will most likely become a more pressing issue. Already ships must wait hours before traveling through the strait, so the addition of more ships to the fray will undoubtedly cause more delays at the expense of oil companies. Even without additional regulation, oil producing countries realize this fact and have begun to explore options to reroute oil around the Bosphorus.

Turkey has a legitimate concern that the vast quantities of oil tankers flowing from the Caspian could cause irreparable damage to the Bosphorus and Istanbul. However, since the strait is an international waterway, it will be nearly impossible to gain approval for restrictions that could effectively control traffic through the 17 miles of curves and currents. Nearly every country except for Turkey wants freer passage and sees no proof of the danger. Turkey has been forecasting a major catastrophe, but as of yet, nothing has happened. The accident involving the *Nassia* brought about the 1994 resolutions and similarly a casualty causing major environmental damage and destruction will give Turkey the leverage it needs to make changes to international law. That Turkey stands to benefit from Bosphorus congestion and regulation is the driving force behind the environmental issue. The environmental concern has always been present, but it is being brought to the forefront for economic reasons. Oil producing countries object to this in that it implies that the environmental issue is simply being used to further Turkey's economic goals. While this is true, the impending destruction of Istanbul and the Bosphorus is no mere pawn for negotiation. Environmental concern regarding the safety of the Bosphorus is very real, well founded, and will only grow with increased tanker traffic.

While the Bosphorus environmental concerns are based in fact, the motives behind voicing the concerns are entirely economic. The Baku-Ceyhan route is the most expensive oil export option, well above the Novorossiysk route or any other export option involving the Bosphorus such as the Baku-Supsa route. Since the least expensive options involve the Bosphorus and Turkey has invested heavily in a route avoiding the strait, Turkey stands to lose heavily if those export options are exercised. The Baku-Ceyhan route will become economically attractive if regulations on the Bosphorus raise the price of transit prohibitively and force the other export options to use costly bypasses.

Turkey needs a reason to restrict the Bosphorus. The environmental issue is a perfect candidate because there is significant history of accidents and the threat of a horrific casualty is very real. However, the fact that Turkey did not raise such complaints before the presence of an economic necessity means that Bosphorus regulation is primarily economically based rather than environmentally. As environmental issues tend to carry little weight in making international policy, this finding is hardly surprising. However, due to the inherent environmental danger in Bosphorus congestion, the increased regulation will have a much needed environmental benefit.

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