



MARMARAY PROJECT

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Abstract: *Marmaray Project, which is one of the most important projects in the world, in İstanbul, to sustain a healthy urban life the citizens of a modern city life and urban transportation means of offering high capacity in order to protect the city's natural and historical features, using a non-polluting electric power, reducing the dependence on individual transportation and highway and roads into parking lots is a project aimed at. Project which aims to unite the two sides of the strait in İstanbul in three underground railway station and the underground part of the throat passage of the project is 13.6 km in total. 37 surface stations, a total of 63 km in length are made and 75 000 passengers / hour / one-way planned to be operational in 2015. Channel Tunnel is the longest immersed tube tunnel, water under the section length is 38 km long. No. of tunnels in the world's deepest immersed tunnel Marmaray as tunneling has taken place.*

In this study, Marmaray Project which solutions can bring to economic and social aspects were investigated by examining the problems of transportation

INTRODUCTION

The Marmara Project is one of the most Project which connects European and Asia Ssides of İstanbul execute by Turkey.

Çok modlu taşımacılık, en az iki ya da daha fazla taşıma türünün (karayolu, demiryolu, denizyolu ya da havayolu) tek bir taşımacılık zincirinde birleştirilmesidir. Uluslararası ve şehirlerarası gibi uzun mesafe ulaştırma problemlerini içeren lojistik uygulamalarında önem kazanmaktadır.

Multi-modal transport, at least two or more of the type of transport (road, rail, sea or air) the combination of a single transport chain. With problems such as long-distance and long-distance international transportation logistics practices is important.

The integration of different transport types by specifying the type of the most economical transportation in total transport costs decline. Single mode transport although some distances economically advantage, as more than one type of move different distances use the integrated advantageously. Modlararası integration of transportation of cargo handling by reducing the transfer of operational efficiency[1].

The rate of 3.6% railways vehicles included several of İstanbul. Paris, Tokyo. In this respect, considerable differences exist in the railway transport in the metropolis, İstanbul remains quite behind.

2.THE HISTORICAL PROCESS

The city of Babylon around 4000 BC, the first tunnel, is said to have been opened under the Euphrates River. 1 km length is 3.5-4.5 m diameter tunnel is made of cut-and-cover method. the first was to open up the Thames River in 1807 under water now, we found many difficulties, opening in the tunnel and then the shield method tunnel was completed in 1842 by the Brunel[2].

BTS Branch Manager no. 1 Brigade in İstanbul KARTAL "Globalizing İstanbul and Haydarpasa-2005 (9)" Panel-Forum has to offer, "in railway transport and provides the following information: Haydarpasa" advertisement "is situated on the railway to connect the two projects are sorted after the 1900s, repeatedly [3].

3. İSTANBUL TRAFFIC

City lines of steamers and Ro-Ros with special motors are used in İstanbul. Beside the fact that the ro-ros were designed for vehicle transportation they are also involved in transportation of passengers.

While over last 20 years there was an increase of 7.5 times in the quantity of motor vehicles, It's estimated that there will be 250 motor vehicles per 1000 person in 2020 in Istanbul. Since July 2012 the number of motor vehicles is 7.274.024 consisting of 4.498.877 automobiles.

Approximately there are 15 million inhabitants as of now. There is an increase of 170.000 people in population each year. This increase brings forth many troubles and the traffic problems become enigmatic. In Istanbul the number of passengers transported on a daily basis is 3 million. Most of transportation is held through % 88.31 of roads, % 3.32 of railways and %8.47 of seaways. 2.645 million people travel thru the roadways. %20 of which prefers IETT (public transportation), %10 prefers ÖHO, %24,6 prefers automobiles, %18 prefers minibuses and %5 travels via taxis[4].

There is a flow of 400 thousand vehicles through Bosphorus and Fatih Sultan Mehmet bridges each day. If to consider that there'll be 600 thousand vehicles locomoting in 2015 a problem of more intense traffic will be seen and both of the bridges will be exploited over %100 capacity,

4. PROJECT AND INVESTMENT

In 1999, the Republic of Turkey and the Japanese International Cooperation Bank (JBIC) signed a financial agreement. This loan agreement forms the basis of finance determined for the Istanbul Strait Crossing. This credit agreement, the competitive tender is a group of international consultants to supply the method.

Map.1



Source: M. ÖZTÜRK

Ministry of transportation and Directorate of Railways, Seaports and Airports Construction (DLH) engages in project management. Avrasyaconsult is a consortium consisting of Japanese and Turkish partners indicated below: Pacific Consultants International (PCI), Yüksel Proje International Inc., Oriental Consultants, JARTS. This partnership has been working in cooperation with groups specified below: Parsons Brinckerhoff International, Inc. (PBI), Terzibaşoğlu Müşavir Mühendislik Ltd. Şti. Yerbilimleri Etüd ve Müşavirlik Ltd. Şti (SIAL) . The BC1 contract, comprising the 13,6 km of Marmaray Project, lying through Gebze to Halkalı was designed to be entegrated with Istanbul metro and Yenikapi – Ayazaga route, Yenikapi – Airport, Yenikapi – Mahmutbey light rail systems in Yenikapi; Umraniye - Uskudar in Umraniye and with Kadikoy – Kartal light rail systems in Ayrılıkçeşme. Marmaray BC1 project (Bosphorus tube crossing, tunnels and Istasyonlar), also known as Kazlıçeşme-Ayrılıkçeşme between 1st race construction for the construction the contractor together with the passage of the throat of the Consortium signed a contract with May 2004 at TKGJ JV. TKGJ JV is a consortium consisting of Japanese and Turkish partners conveyed below: Taisei corporation, Kumagai Gumi Co. Ltd., Gama industrial facilities manufacturing and montage Inc., Nurol construction and trade Inc. co. [5].

At years of 2003 and 2004, negotiations were held with European Investment Bank (EIB), in order to organize financial agreements for important parts of the project. At fall of 2004, a loan agreement was signed with EIB to finance the commuter rail systems. The investment costs of Uskudar Project – which came about owing to Marmaray Project- except expropriations is 3 million USD; the circumference of area to be expropriated is 39 478 square meters and the quantity of the buildings is 1 026, a bazaar with exact usable area of 6 thousand square meters and car parks will be built under Uskudar square which will be closed to traffic.

Department of transportation, General Directorate of Railways, Ports and Airports Construction by the Marmaray project-railway Bosphorus tube crossing part of the loan agreement for the purposes of supplying extra funding amount of 98 billion 732 million will have been reported when the 140 billion 810 million thriving business.

on June 30, 2008 at the auction on January 13, 2009 signed a contract with contractors for road motor vehicle tube tunnel routes plan, approved on April 10, 2009 by İstanbul metropolitan municipality. Approximately 1 billion 100 million dollars expected to come out and the build-operate-transfer model and the project business will be the 25 year period of 11 months.

4.1. The Contents Of The Project

Marmaray, Gebze-Halkalı 76 kilometers will be built on the route between. This 63 kilometer immersed tube tunnel underground rail, 1.4 km of the surface, and cut-and-cover tunnels with 11.6-kilometer while drilling stations. . By the end of the project its planned that there will be 75 thousand passengers transported from the single way and 150 thousand through both ways.. The first stage will carry over 1 million passengers per day depending on the growing demand on the system log can be moved 1 million 750 thousand passengers as well.

By providing a concordance between Istanbul Metro and Yenikapi, a pass over via safe, fast and comfortable mass transit will be plied to the passengers through Taksim-Shishli- 4 Levent- Ayazaga.

- Because of the integration with Esenler Mahmutbey light rail system a pass over via safe, fast and comfortable mass transit will be provided.

- Constituting an integration with a Light Rail System which is going to be constructed between Harem and Kartal will provide a pass over via safe, fast and comfortable mass transit system.
- Share in urban transportation of railway will be increased.
- Most important thing is that Asia and Europe will be linked by a railway making a high capacity mass transit possible.
- Contribute to the protection of historical and cultural environment,
- No Throat and change will not be opened,
- With the project startup, the transits will be held up between 2-10 minutes transporting 75 000 passengers from both of the shores,
Duration of transits will be decreased,
- The burden of the current Strait Bridges will be diminished,
- İstanbul brought a permanent solution to the problem of traffic accidents will be reduced to a minimum level, reducing the number of road vehicles, cars and bus traffic on rahatlatmasının, will offer users the option to quickly transport custom cars,
- Energy saving due to less traffic and providing motor vehicle use, less air pollution and noise pollution. [6].

4.2. Tunnels

An East-West direction, consisting of two lines, which will process the 13.6 km rail system for a total of four stations and one above ground on the three ventilation building. In addition, the scope of the project will be built in two diesel generator building. Kazlı level crossing between Yedikule Ventilation Building area with fountain Station bridge, fill and reinforced concrete structures, such as the splitting cross section retaining structures are available in the U. Marmaray project under the structures and works as follows: BC1

- Immersed tube tunnel: 1,387 m
- CPC Tunnels: 9,360 m
- NATM Station and tunnels: Sirkeci Station, points and Crossing Tunnels
- On/off Yenikapı and Sirkeci station (input), divisions and Uskudar Ventilation buildings, Ayrılıkçeşme, Yedikule-Yenikapı –
- Above Ground Sections: Kazlıçeşme Station
- Other Facilities: Open/Close Tunnels, Retaining Structures (Fill/Splitting), Reinforced Concrete U Sections, Bridges, Generator Buildings
- Line works: grade and Tüneliçi railway construction
- Electrical and mechanical Jobs
- Replacement Of Existing Railway Track.

Estimated travel times; Gebze and Halkalı-105 minutes, BostaMarmaray project, İstanbul's present total of 76 km on both sides of the neck Ring-Sirkeci and Haydarpaşa-Gebze commuter rail improvement (a CR1), İstanbul Strait immersed tube tunnel to connect with each other in deducted (BC1) and captured vehicles available that was composed of three separate auctions (CR2). This project is complete, the passenger transport capacity of 75,000 per hour in one direction, I will be getting one. Railway Bosphorus tube crossing (Marmaray) BC1 Project, Asia and connecting with each other from the bottom rail Cross-century Premier İstanbul is a waking dream. The Marmaray BC1 Project, layout, this dream, as well as intense and especially İstanbul Historical Peninsula immersed tube tunnel floor and approximately 16 km from the Sea of Marmara in the last row, producing large earthquakes ($M > 7$) close to the active North Anatolian fault line, also due to an outstanding project. Marmaray BC1 Project, the approximately 13.5 km long and includes the Kazlıçeşme (Europe) – Ayrılıkçeşme (Asia). Marmaray BC1 project, immersed tube tunnel 1387 m (the deepest level is the deepest in the world, immersed in-place-56 m batırılacak tube tunnels), 10 km double tube TBM tunnel

(CPC and NATM) 670 m stations, including cut-and-cover tunnel, 1790 m of cut and fill, splitting and surface[7].

Over the years, in which time the system service will be calculated to the total savings will be about 13 million hours; as of 2015 the total time savings to be achieved, there will be approximately 25milyon hours and the capacity of the systems to be obtained completely becomes available, about 36 million hours per year, saving time, or nearly every day all over the world people won by 7.1 years.

4.3. Review of the project in terms of Earthquake

Published by the Ministry of public works of Turkey Quake map of the earthquake zone, in Zones located primarily in İstanbul I.. İstanbul is divided into 5 main earthquake zone in itself. İstanbul, Ümraniye, Üsküdar, Küçükçekmece, Pendik districts of hunters, Tuzla is a faylanmanın intensive regions i. Degree earthquake zone. Marmaray project in 2002 and before the auction for the tender were carried out detailed ground studies after 2004. The structures of depremsemiği, both on land and at sea to be considered the worst scenario possible İstanbul earthquake, earthquake, dynamic modeling of structures on the fly. This will be mainly for modellemelere will be built according to the structures Quake magnitude of $M < 7.0$ 7.5 (Eurasian Consult studies, 2002). Marmaray tunnel excavation down to bedrock, to the route have cracked sandstone, mudstone formation of intermediate-level kilitli, Trakia. This formation is generally impervious to the nature of the fault is either half is made up of layers that are impervious to the aquifer[8].

Marmaray Tube Passage project for earthquake hazard in the Marmara region, the resulting CPT data and analysis obtained by the analysis of acceleration and size depending on the possible ground by using values from the sivilaşmasına oturmalar. Depending on the presence of sivilaşmaya sivilaşma in the workspace and sitting areas are required to run the required ground considering improvement. Also looking at "total living-momentum relationship acceleration and magnitude values increases, an increase was observed in the total[9].

Şennazlı, lightning, Biberoğlu, Olgunöz study, three-phased Marmaray project "completed each other and geotechnical investigation studies bütünlemiştir. This project has been completed and construction of geotechnical works designs were seated on its work. Still ongoing project, geological and geotechnical matters, it's not a mismatch between the application and design ". [10].

5. CONCLUSION

At the beginning of this project, he brought "will also have specific ownership of turn the Marmaray, is such a consortium with foreign partners in a strategic Strait pass devredileceği likely is a fact".

According to the project's transportation-related, midnight 00: 00-05 hrs am. p.m. TCDD tools, "end of day care the Marmaray series transitions", except for the women is allowed. Moreover, it is to be a deal with the transition from the tube, the tube will be subject to the permission of the owner of the passage of the Treaty side. From there, the connecting transit, not as the result of the interpretation can be made out of the transportation, the women said to be permitted to relay will be in the Mideast, TCDD tools passenger transportation that is allowed to relay to people or not. In this regard, the high-speed train project, carried out with the idea of giving enough work done on the Marmaray, Intercity trains out of İstanbul suggests that underneath prior.

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ПРОЕКТ „МАРМАРАЙ“

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Ключови думи: Проект „Мармарай“, Истанбул, Европа, Азия

Резюме: Проектът „Мармарай“ или Мраморния проект е един от най-важните проекти за мегаполиса Истанбул в Турция и в света. Целта на проекта е да улесни модерния градски живот на гражданите, чрез решения за градския транспорт, които предлагат защита на природата в града и историческите ценности, използвайки електрическа енергия, която не замърсява околната среда. Също така проекта намалява зависимостта на придвижването с индивидуален транспорт от задръстванията по авто магистрали и пътища.

Проектът, има за цел да свърже с релсов железопътен транспорт двете страни на пролива Босфора в Истанбул като обхваща крайбрежните райони на Мраморно море в Азиатска и Европейската част на Турция. Цялата дължина е 63км, като към момента са завършени 37 спирки на повърхността. Подземна част на проекта е 13.6км от общата дължина и има три спирки на метрото, като се очаква да започне да функционира през 2015 г. и да обслужва 75 000 пътници на час в едната посока. Тунелът е най-дългия под вода с дължина на участъка под вода 38 км. Няколко тунела съставляват най-дълбокия в света подводен тунел „Мармарай“.

В това проучване, чрез изследване на проблемите на транспорта е разгледан проекта „Мармарай“, който може да допринесе за икономическото и социално развитие на мегаполиса Истанбул и региона.