

# RION-ANTIRION BRIDGE (HARILAOS TRIKOUPIIS BRIDGE), GULF OF CORINTH, GREECE

## OVERVIEW

**LOCATION:** GULF OF CORINTH, GREECE  
**SCOPE:** INTER-URBAN  
**TRANSPORT MODE:** ROAD  
**PRINCIPAL CONSTRUCTION:** BRIDGE  
**NEW LINK:** YES

## PRINCIPAL OBJECTIVES

**LOCAL & REGIONAL TRANSPORT LINK**  
**REDUCE TRAVEL TIMES**  
**PART OF EU TEN-T NETWORK**  
**REGIONAL ECONOMIC DEVELOPMENT**  
**CONGESTION & POLLUTION RELIEF**

## PRINCIPAL STAKEHOLDERS

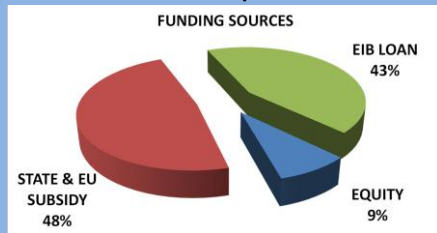
**PROMOTER:** GREEK STATE  
**FINANCIER:** EU/EIB/STATE  
**GUARANTORS:** BANKS OF TOKYO-MITSUBISHI & AMERICA ETC  
**CONCESSIONAIRE:** GEFYRA SA

## PLANNING AND IMPLEMENTATION

**APPROX. PLANNING START DATE:** 1986  
**CONSTRUCTION START DATE:** 1998  
**OPERATION START DATE:** 08/2004  
**MONTHS IN PLANNING:** 144  
**MONTHS IN CONSTRUCTION:** 74  
**PROJECT COMPLETED:** FIVE MONTHS AHEAD OF SCHEDULE

## COSTS (IN 2010 USD)

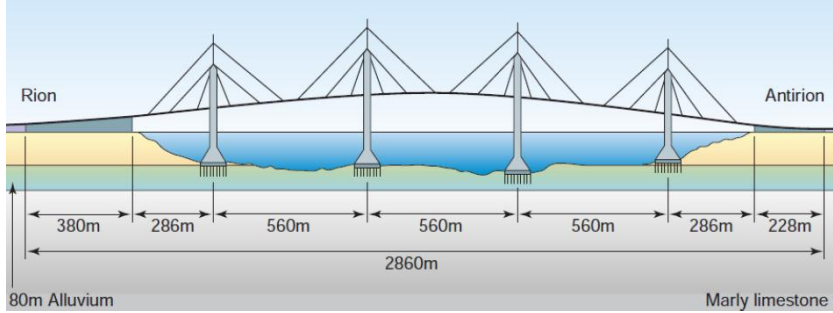
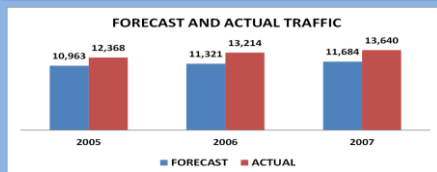
**PREDICTED COST:** 1.50N  
**ACTUAL COST:** 1.31BN  
**PROJECT COMPLETED:** 13% UNDER BUDGET  
**FUNDING:** 90% PUBLIC/10% PRIVATE



## INFRASTRUCTURE QUANTITIES

**LENGTH (TOTAL):** 2.86KM  
**LENGTH (CABLE-STAYED):** 2.25KM  
**COST PER KM (2010 USD):** 0.46BN

## PATRONAGE



## INTRODUCTION

The Rion-Antirion Bridge is the longest multi-span cable-stayed bridge in the world. It was designed and built to cope with exceptionally difficult physical conditions in the straits between Rion and Antirion, including high water depths, strong winds, seismic activity and weak soil. It opened in 2004 and was part of the Olympic Torch route for the 2004 Games.

The bridge crosses the Gulf of Corinth near to the port of Patras, links two major national road axes, and is part of the EU TEN-T priority network of transport infrastructure.

## BACKGROUND

The main objectives of the project were: to provide an alternative to the ferry boat service between Rion and Antirion, reducing the cost and time of crossing and so encouraging economic and cultural development in the region; to enhance road connections to Western Europe; and to form a basis for local regeneration plans.

The need for a fixed link across the Gulf has been recognised since 1889, when Prime Minister Harilaos Trikoupis proposed a rail link. In 1980 the Greek State invited tenders for the construction of a road bridge but the project stalled due to a lack of interest from the construction industry; a second attempt in 1987 was cancelled as none of the bidding consortia submitted acceptable bids. The third call for tenders in 1991 specified a privately financed solution funded by road tolls. Of seven consortia, Gefyra was the only one to submit a bid that could be considered, and this later led to legal disputes.

The EU was also influential in the evolution of the project, designating the bridge as part of the priority network, promoting the use of private finance, and providing use of the Structural Funds. A 1992 environmental impact assessment by the University of Patras was issued for local public consultation. The project went ahead despite appeals to the Supreme Administrative Court because the it was deemed to be of national importance and so the contract was ratified by law. This has caused debates in the juridical community.

## TIMELINE

CONCEPTION: 1964: GEOTECHNICAL SURVEYS

CONCEPTION: 1974-77: EXPERT CONFERENCES

CONCEPTION: 1980: INTERNATIONAL CALL FOR PROPOSALS BUT NO INTEREST FROM CONSTRUCTION COMPANIES

CONTEXT: 1981-85: CENTRE-LEFT GOVT, ANTI-MEGA PROJECT PERIOD

PLANNING: 1986/87: EFPALINOS/RPT HIRED AS TECHNICAL ADVISOR, CALL FOR PROPOSALS

PLANNING: 1988: FIVE CONSORTIA SUBMIT PROPOSALS, THREE ASKED TO CONTINUE

CONTEXT: 1989: POLITICAL UNREST DELAYS GOVT DECISION ON PPP

CONTEXT: 1990: PORT TRAFFIC INCREASING AS YUGOSLAV WARS CUT OFF LAND ROUTES

PLANNING: 1992: ENVIRONMENTAL IMPACT ASSESSMENT LEADS TO APPEALS TO SAC

PLANNING: 1993: NEW TENDER PROCESS LAUNCHED – GEFYRA PREFERRED BIDDER

CONCEPTION: 1994: BRIDGE IDENTIFIED AS PART OF EC TEN-T PRIORITY NETWORK

DELAY: 1995: EC EXAMINES LAWFULNESS OF GEFYRA'S TENDER FOLLOWING APPEALS FROM COMPETITORS

PLANNING: 1996: CONCESSION CONTRACT SIGNED WITH GEFYRA & RATIFIED BY PARLIAMENT, EIB APPROVES LOANS

PLANNING: 1997: GEFYRA & EIB SIGN LOAN AGREEMENT

CONSTRUCTION: 1998: PRE-CONSTRUCTION

CONSTRUCTION: 2000 (SEPT): CONSTRUCTION STARTS

CONSTRUCTION: 2001: FIRST FOUNDATION COMPLETED

CONSTRUCTION: 2004 (AUG): CONSTRUCTION COMPLETED

DELIVERY: 2004 (AUG): OLYMPIC FLAME PASSES OVER BRIDGE

DELIVERY: 2004: BRIDGE OPENED TO TRAFFIC

ACCIDENT: CABLE CATCHES FIRE, BRIDGE CLOSED FOR A WEEK, EXPERT INVESTIGATION BUT NO LEGAL MEASURES

DELIVERY: 2039: END OF CONCESSION

## CHARACTERISTICS

The cost was estimated at ECU 0.69bn in 1996 (USD 1.50bn at 2010 prices)<sup>i</sup>. The final project cost was EUR 0.8bn (slightly lower when adjusted for inflation, at USD 1.31bn in 2010 prices) including supervisors' and checkers' fees, operating and financial costs.

The State signed a DBFO concession contract with Gefyra SA in 1996 for 42 years. Gefyra was formed by the French firm GTM (later acquired by Vinci Concessions), with a 57% share, and three smaller Greek firms. It consists of a construction joint venture, Kinopraxia Gefyra, and an operator, Gefyra Litourgia. Construction costs accounted for 83% of the total, based on a fixed lump sum contract and additional works costing about 6-7%, and Kinopraxia Gefyra also received bonuses from the State for delivering the bridge in time for the 2004 Olympics, almost five months ahead of schedule.

The seven year construction period included two years for preparatory works and final design, and five years for construction. The site presented challenging physical conditions including deep water and weak soil, and the project pioneered the use of a custom-made tension-leg barge to perform marine works.

## TIMELINE ISSUES

During the long gestation period of the project, delays were caused by the initial lack of interest from construction companies and political events. Appeals to the EC by competitors caused a further delay before contracts were signed.

## FUNDING

The project was funded mainly from public sector sources: State and EU subsidies (48%) and European Investment Bank loans (43%). The concessionaire provided 9% equity funding. As the EIB was unwilling to accept construction risk, the loans were guaranteed during construction by a consortium of 31 banks led by the Banks of Tokyo-Mitsubishi and America. The concession contract can be terminated early if Gefyra achieves a predetermined return on its equity.

A 1992 study by Efpalinos /RPT predicted traffic volumes of 10,612 vehicles per day by 2005, increasing by over 3% per year. Actual traffic volumes have been 12-17% higher than forecast.

<sup>i</sup> The ECU (European Currency Unit), 1979-99, is assumed to be equivalent to the EUR for conversion purposes. Costs have been converted to USD at 2010 prices, using historic inflation rates and current exchange rates, to allow comparison between projects.