

Railways of Islamic Republic of Iran (RAI) Opens Bafq–Mashad Line

International Transportation

Iran is a middle-eastern country with two important waterways—the Persian Gulf and Gulf of Oman to the South, and the Caspian Sea to the North. Its central position in the Middle East with two long coastlines makes it a commercial and political regional hub for surrounding countries. As a consequence, both shipping and railways are exceptionally important to Iran.

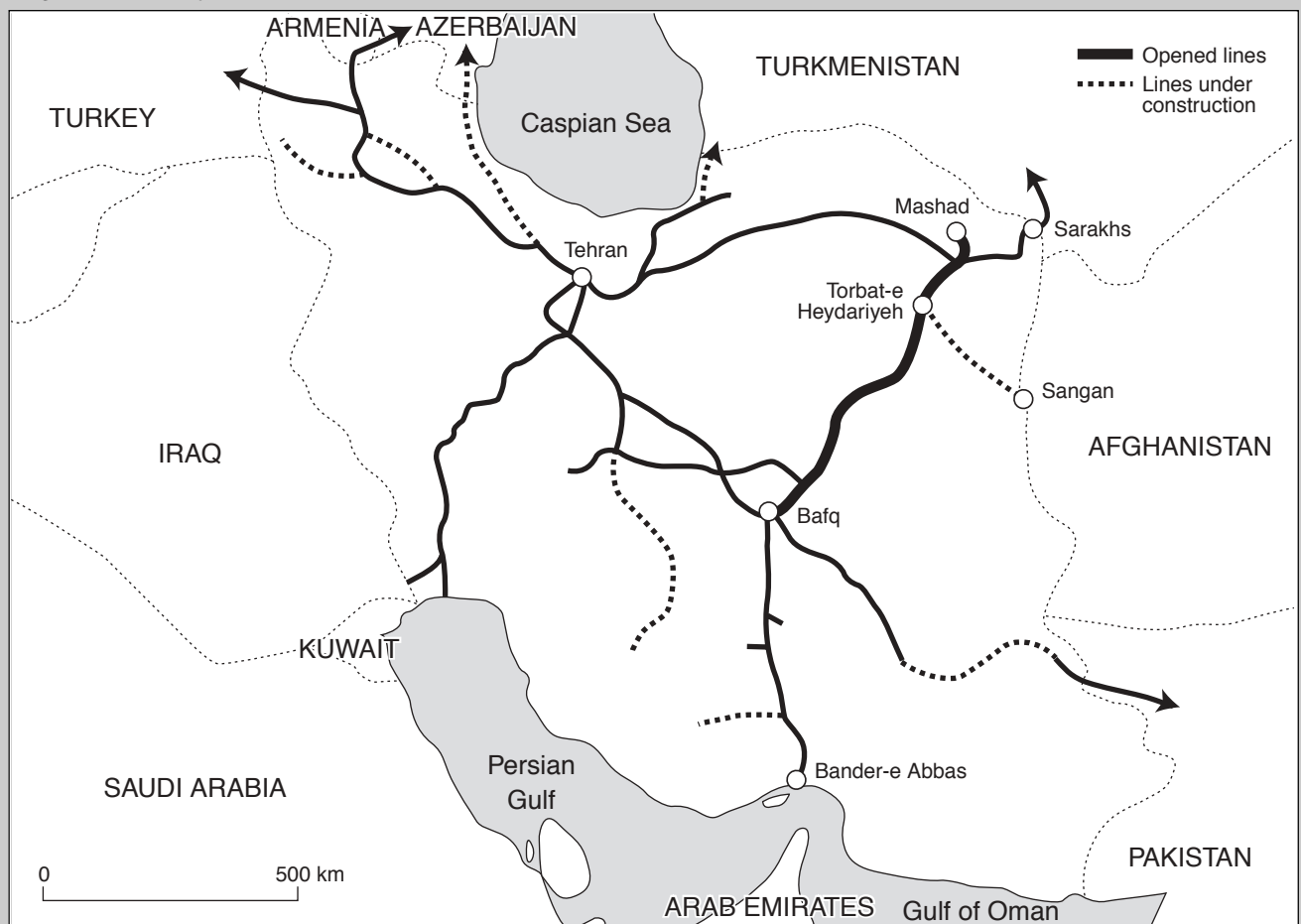
Aims of Bafq–Mashad Project

Late 2004 saw the opening of an important new standard-gauge north–south rail link between the countries of central Asia, like Turkmenistan and Afghanistan, with the Persian Gulf via Sarakhs on the Iranian–Turkmenistan border through Mashad and Bafq to Bandar-e Abbas on the Strait of Hormuz (Fig. 1). The new section of line has 36 stations totalling 21,700 m² between Bafq and Mashad. It cuts 800 km off the previous circuitous route to reduce shipment costs and transit times with

freight trains running at 120 km/h, increasing Iran's share of the regional international rail-freight market as well as its foreign-exchange income.

In addition to strengthening international trade through Iran, the new link will connect domestic manufacturing centres and mineral resource-rich regions like Chadormalou, Zoqal Parvadeh (Tabas), Sangan and Seh Chahoun with the major port of Bandar-e Abbas, and the important provinces of Khorrasan and Esfahan. For example, the opening of the new link is predicted to carry 10 million tonnes of raw materials annually from iron-ore mines to steelworks.

Figure 1 Railway Network in Iran



In addition to higher levels of domestic and international freight, the shorter direct route is expected to carry 1–2 million passengers per annum between the provinces of Yazd, Kerman, and Hormozgan.

Due to the strong support of regional and international organizations like the International Union of Railways (UIC), the Economic & Social Commission for Asia & the Pacific (ESCAP) and the Economic Cooperation Organization (ECO), the project was completed by in-house consultants and contractors in just 4 years—a unique achievement in the history of Iranian railway operations and speed of international decision making. Table 1 summarizes the technical specifications of the new section between Bafq and Mashad.

Transit Forecast

In 2002, the total of transit freight was 4.8 million tonnes, comprising 3.5 million tonnes of through freight and 1.3 million tonnes of transshipped freight. Before the opening of the link, Sarakhs at the northern end of the new line and the port of Bandar-e Abbas on the Strait of Hormuz at the southern end handled about 20% and 45%, respectively, of all

Table 1 Technical Specifications of Bafq–Mashad Line

Rail, Track and Station Structures	
Rail type and amount of rail	UIC60; 120,000 tonnes
Minimum curve radius	700 m
Maximum grade	15‰ (1:6)
Axle load	25 tonnes
Turn-out types and number	UIC60; 400
Fasteners and number	Pandrol & Vossloh; 7 million
Sleepers	Monobloc prestressed concrete; 1.7 million
Ballast	3 million m ³ of 20–60 mm broken igneous stone
Important passenger stations and formation yards	
Tabas Station	Platforms 6,000 m ² ; Yard 330,000 m ²
Torbat Heydariye Station	Platform 6,000 m ² ; Yard 890,000 m ²
Civil Engineering Works	
Excavated earth	48 million m ³
Embankments	44 million m ³
Excavated foundations	1.4 million m ³
Total length of tunnels	5,800 m
Total length of cuttings	3,700 m
Bridges	3,814 (23 long span and 3791 short span)

freight in transit through Iran. Moreover, the Sarakhs–Bandar Abbas corridor is the nation’s most active, carrying 76% of the total rail freight in transit.

The first year of full operations is expected to see transit freight jump to 1 million tonnes increasing to 3 to 5 million tonnes in coming years. In concrete terms, this growth is expected to be due to a 30% growth in volume of transported cotton from the current annual average of 350,000 tonnes, while petroleum shipments are expected to increase by 50% from the current level of 450,000

tonnes. Container shipments will grow from the present 3500 TEUs to 4200 (+20%) while general goods will grow from 150,000 tonnes to 180,000 tonnes (+20%). These increases are due to two principal factors below:

- Cuts in previous transport time between Sarakhs and Bandar-e Abbas from 6 days to 4 days and in distance from 2431 km to 1617 km
- Cuts in transportation costs by about 15%–20% due to the 800-km distance reduction



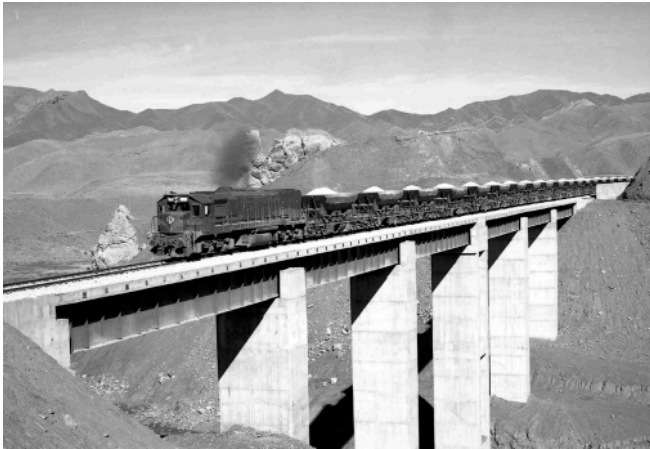
Freight locomotive at Bafq Station

(RAI)



Inauguration of Bafq–Mashad Project

(RAI)



Diesel freight locomotive crossing Salar Bridge



(RAI)

Key Freight Traffic

The new link passes through a number of cities in Khorrasan Province, which covers about 19% of Iran's total area and has population of 6.5 million people. Industry in Khorrasan is mainly agricultural with both food and carpet weaving as mainstay products; cement production, ceramics, and construction materials form the second rank. About 10 million tonnes of freight, totalling 4.2 billion tonne-km, are expected to be shipped over the new line in 2005. Some will be bulk ores from mines in Sangan Parvadeh and Seh Chahoun to steelworks in Neishabour, Esfahan and Bandar-e Abbas; the remainder will be domestic and transit freight moving between Sarakhs and Bandar-e Abbas and *vice versa*. The total of all freight from Khorrasan to other provinces climbed from 9.5 million tonnes in 2000 to 15.48 million tonnes in 2003, but about 20% of this amount is likely to be diverted to rail by the end of 2005.

Better Cross-border Traffic

In addition to the main line between Mashad and Bafq, a new branch line is being constructed from Torbat-e Heydariyeh to Sangan very near the border with Afghanistan. Hopefully, a new line will be built in the near future from the border area to Herat in Afghanistan, facilitating direct rail links from Afghanistan into Iran and then onwards to the networks of neighbouring countries via Iran's railway network.

Passenger Operations

Passenger services are managed and operated by Raja Passenger Trains Company. The development of passenger services in Iran has been hampered by low speeds and the dominance of single-track sections. Only the line between Teheran and Mashad is double track and that only since 2002. As a result, in 2002, there

were 14.3 million passenger journeys, totalling 8.64 billion passenger-km. The opening of the Bafq–Mashad section with passenger trains running at 160 km/h is forecast to increase passenger levels by 1.5 million per annum, leading to an extra 1.5 billion passenger-km in the first phase and 2.5 billion passenger-km in the second phase.

Crucial Role in Exports and Imports

In 2002, rail freight between Iran and countries in the Commonwealth of Independent States (CIS) totalled 5.48 million tonnes. Table 2 shows exports and imports with the neighbouring CIS countries. The new section of track between Mashad and Bafq is the fastest and shortest route for moving freight between Uzbekistan, Turkmenistan, Kazakhstan, Kyrgyzstan, and Tajikistan to the Persian Gulf. In addition, the new line forms an ideal part of the plans to link Asia with Europe via a southern Silk Rail Road running through Almaty (3784 km), Bishkek (3501 km), Tashkent (2794 km), and Ashkabad (see *JRTR* 28, pp. 50–55). ■

Acknowledgment

This article is based on information received by *JRTR* from RAI.

Table 2 2002 Rail Freight with Neighbouring CIS Countries (1000 tonnes)

Country	Exports	Imports
Turkmenistan	258	48
Uzbekistan	69	178
Tajikistan	63	9
Kyrgyzstan	37	15
Kazakhstan	42	1322
Total	447	1614