Kingdom of Thailand

Highway Sector Project (II)

Report Date: March 2001
Field Survey: September 2000

1. Project Profile and Japan's ODA Loan

Site Map: Central and Northeastern Thailand

Northeastern IM-7

(1) Background

The Thai economy is growing rapidly, but it is becoming necessary to correct the widening regional disparities caused by that growth. The Sixth National Economic and Social Development Plan (1987-91) identified the roads sector as one of the most important for promoting regional economies. The Plan called for focused efforts on repairs to regional roads to maintain their functions, and for efficient building of road networks. Roads remained a focus area in the Seventh Five Year Plan (1992-1996).

Thailand's economic progress is accompanied by surging growth in traffic volumes, and various plans, including the Fifth and Sixth National Economic and Social Development Plans have called for raising the standards of national, provincial and local roads through paving, widening and other measures. The Thai Ministry of Transport and Communications, Department of Highways (DOH) selected 20 roads which urgently required action and offered high economic impact from a list of roads indicated as requiring action, and decided to improve, widen and repair them under the 14th ODA Loan (Agreed in November 1988). However, later increases in the costs of materials and equipment, and changes in the content of the improvement works prompted by rising traffic volumes, increased the project cost. Therefore the list of 20 roads to be covered by the 14th ODA loan was narrowed to nine roads. Of the remaining 11 roads, the Thai government improved eight with its own funds, and asked for three to be covered under the 17th ODA loan (this project). After the loan agreement was signed, one of the three roads (IM-22, 14.6km between Nong Chok and Bang Nam Prioe) was built by the Thai government with its own funds due to the urgency of the project. Therefore the project only covered the two roads listed in Table 2. Table 1 shows the ultimate funding sources for the 20 roads.

Table 1: Project Funding Sources for the 20 Roads

Under the 14th ODA loan (signed in November 1988)	9 roads
Under the 17th ODA loan (signed in January 1993) (this project)	2 roads
From the Thai government's own funds	9 roads

Table 2: Content s of the Project

	IM-7	IM-14
Project location	Northeastern Thailand	Central Thailand
Road length	41.9km	24.6km
Section	Between Lao and Tha YomTha Yom	Between Wang Noi and Thanyaburi
Construction content	Asphalt paving and embankment protection on a grade 4 regional road.	Widening of a laterite road to a grade 3 regional road, paving and new bridge construction
(Note) Standards	(Standard for a grade 4 regional road) • Width 9m, two lanes • Design speed 60~80km/h • Low-grade asphalt paving	(Standard for a grade 3 regional road) • Width 10m, two lanes • Design speed 70~90km/h • Medium-grade asphalt paving

(2) Objectives

To improve (from laterite road to asphalt paving), widen (9m to 10m) and repair one provincial road and two regional roads in Northeastern and Central Thailand in order to make the road network more efficient and nurture local industry.

(3) Project Scope

The ODA loan covered the entire foreign currency portion and a part of the local currency portion of asphalt paving and embankment protection for one road in the Northeast, and widening, new bridge construction and paving of laterite surfaces for two roads (later changed to one road) in Central Thailand.

(4) Borrower/Executing Agency

Kingdom of Thailand / Department of Highways, Ministry of Transport and Communications: DOH

(5) Outline of Loan Agreement

Loan Amount/Loan Disbursed Amount	¥2,184 million / ¥973 million
Exchange of Notes/Loan Agreement	December 1992 / January 1993
Terms and Conditions	Interest rate: 3.0%, Repayment period: 25 years (7 years for grace period), General Untied
Final Disbursement Date	March 1999

2. Results and Evaluation

(1) Relevance

This project was in line with Fifth, Sixth and Seventh National Economic and Social Development Plans, and targeted roads which were selected for the urgency and for their strong economic impact. The appropriateness of the plan was recognized both before and during its implementation.

This project (the 17th ODA loan) initially covered three roads, but one of them (IM-22 14.6km between Nong Chok and Bang Nam Prioe) required an urgent start to its repairs, and was therefore repaired by the Thai government with its own funds. As a result, the project only covered two roads, and the project cost of the portion covered by the ODA loan was substantially reduced. This can be regarded as an unavoidable change.

As shown in Table 2 above, the two roads covered by the project joined relatively large towns within their regions. Both were very necessary, high-priority projects for the progress of regional economies and for promoting local economic development, and as such the plan was appropriate.

(2) Efficiency

[1] Implementation Schedule

The plan was scheduled for completion in April 1995, but in fact it was completed in December 1998, approximately three and a half years late (IM-7 came into use in 1996, IM-14 in 1999). The main cause of the delay was that it was impossible to acquire the land in the short period of three months allowed between the start of procedures and the scheduled start of construction. In particular, part of the route passed through agricultural land reform areas to which the Land Acquisition Law is inapplicable, which meant that the compensation negotiations with the landowners took longer. In addition, the delay in land acquisition caused the delay of the detailed designs for some portions of the project.

[2] Project Cost

The project cost covered by the ODA loan was greatly reduced by the exclusion of IM-22 from the project scope.

[3] Implementation Scheme

The DOH, which was the executing agency for this project, has abundant experience of carrying projects using not only ODA loans but loans from the World Bank, the Asian Development Bank and other agencies, and there were no problems with the execution of the project.

(3) Effectiveness

[1] Traffic volume

Table 3, which shows traffic volumes on each route (IM-7, IM-14), indicates that the actual traffic volumes are far higher than the initial plans. Traffic volumes are growing rapidly, but these increases reflect the rapid development of Thailand's economy, economic development of the regions, the rise of motorization and other factors. Of the increases in traffic volume, 85% of the increase on IM-7 was in ordinary traffic

volume, while 80% of the increase on IM-14 was redirected traffic. Both roads are used far more heavily than planned.

Table 3: Traffic Volumes (average daily volumes)

Unit: vehicles/ day

	Totals excluding motorcycles		Totals including motorcycles	
(Initial plan)	IM-7	IM-14	IM-7	IM-14
1993/1994	(1994) 173	(1993) 320	(1994) 420	(1993) 445
2000/2002	(2002) 214	(2000) 443	(2002) 522	(2000) 568
(Actual volumes)				
1996	1,357	-	2,116	-
1999	1,637	4,623	2,580	4,868
2000	1,739	4,908	2,749	5,170

Source: DOH material

Notes 1)The year of the initial plan differs between IM-7 and IM-14 due to the difference in survey year.

2)Traffic volume rose enormously compared to the initial plan, but it can still be carried on a single carriageway road without problems.

[2] Economic Internal Rate of Return (EIRR)

The EIRR was recalculated after the completion of the project, using recorded values and the same assumptions as at the time of the appraisal.

The table below shows the conditions applied to the EIRR recalculation and the recalculation results. The recalculated EIRR is much higher than the figure from the appraisal due to the great increase in traffic volume.

Table 4 Comparison of Original and Actual Scope at the Time of Appraisal /EIRR

		Appraisal〔1992〕	Recalculation based on recorded values
Project life		10 years	Same as left
Cost		Project cost and maintenance cost	Same as left
Benefit	IM-7	Saving of driving costs (Benefits to be realized from 1995)	Same as left (Benefits realized from 1996)
	IM-14	Saving of driving costs and travel times (Benefits to be realized from 1995)	Same as left (Benefits realized from 1996)
EIRR	IM-7	11.7%	46.8%
	IM-14	11.5%	49.6%

(4) Impact

[1] Promotion of the local economy

The Thai economic crisis, which began in 1997, led to stagnation in the rural economy from 1998, and this project was completed at the end of 1998, at the peak of the economic crisis. Nevertheless, traffic volumes were much higher than predicted. IM-7 in the Northeast links with Udon Thani, which is a major consumption center. It was built to encourage the distribution of agricultural produce and help to stimulate

the agricultural and rural economy. In Central Thailand, IM-14 is located in an area of lively industrial activity, with heavy truck traffic. These situations are thought to have led to traffic volumes on both roads far exceeding the forecast values.

With the economic recovery that began in 2000, the volume of traffic on the regional road network, which includes this project, grew further than planned. Therefore the construction of regional roads, with the objectives for promoting regional economies and nurturing local industries in order to correct regional disparities, is successfully fulfilling its initial purpose.

[2] Raising the efficiency of road networks

Udon Thani is the main city of the Northeast (population 1.4 million, as of 1993), and IM-7, which links to it (41.9km from Lao to Tayom) is an essential road for the distribution of agricultural produce. In Central Thailand, IM-14 (23.2km between Wang Noi and Thanyaburi) is not a long road overall, but within the Bangkok capital region it is an important element of the network linking the capital with the North and the Northeast. As such it alleviates congestion in these areas, and thus makes the anticipated contribution to promoting industry and enhancing the efficiency of logistics.

[3] Environmental and social impact

The environmental survey is conducted by Department of Planning under Department of Engineering, but as the project only involves the improvement and widening of an existing road it has no major impact on ecological protection along its route. As the project runs through rural areas, the total traffic volume is not very large, thus no major environmental impacts in forms such as noise, vibration or air pollution has been reported.

Besides providing compensation for the farm land, the DOH made improvements to the farming properties adjacent to the expropriated road sites, upon request from the farmers, to avoid any negative impact on agricultural productivity in the future. This process, while it took a time, has solved all issues related to compensation.

(5) Sustainability

[1] Operation and Maintenance / Capabilities

Operation and maintenance is handled by the Maintenance Division within the DOH's Department of Maintenance. Namely, IM-7 is maintained by the Udon Thani District Roads Office and IM-14 by the Ayutthaya District Roads Office. Each district roads office comprises one engineer and 15-25 workers. This system presents no problems for ordinary maintenance works, but extensive repairs involve the DOH head office.

[2] Operation and Maintenance Method

Maintenance work by the DOH is carried out on the basis of manuals by methods described below. Works are carried out in the four levels shown in Table 5 below (regular maintenance, periodic maintenance, special maintenance and minor improvements, and emergency repairs). There are also well-defined maintenance methods for the management of equipment and materials, and for safety management. The

DOH has abundant experience in the construction and maintenance of national and regional roads, and it receives planned budget allocations for maintenance. The maintenance status of the roads is good at present. The state of roads after construction is checked regularly by the district roads offices.

Table 5: DOH Maintenance Methods

Type of maintenance	Method
Regular maintenance	Inspections are made regularly and maintenance repairs are carried out, several times a year if necessary. Regular repairs are made to road surfaces, road shoulders, drainage systems, land management, traffic operations and bridges etc.
Periodic maintenance	After more than a year has elapsed, periodic repairs such as overlays and repaving are carried out as required at a set interval.
Special maintenance and minor improvements	These are carried out as necessary, including minor improvements such as widening, paving reinforcement and the new construction of related structures.
Emergency repairs	Emergency repairs are carried out to restore roads from damage due to unpredictable natural calamities such as floods and landslides.
Maintenance of equipment and materials	The fuel and other expenses for equipment and materials loaned from the Equipment and Materials Office for the purpose of regular maintenance are supervised.
Safety management	Facilities for the safety of road users, such as cycle lanes, pedestrian crossings and bus stops are managed.
Road shoulder paving	Laterite-paved hard shoulders on existing expressways are paved to higher standards.

Comparison of Original and Actual Scope

Item	Original	Actual
① Project Scope		
(Northeast)		
-Provincial road between Lao and Tha Yom (IM-7)	41.9km	41.9km
(Central)		
-Local road between Wang Noi and Thanyaburi (IM-14)	23.2km	24.6km
-Local road between Nong Chok and Bang Nam Prioe (IM-22)	14.6km	Cancelled
② Implementation Schedule		
-Land purchasing	Jan. 1993 ~ Sep. 1994	Oct. 1994 ~ Oct. 1998
-Selection of contractors	Sep. 1992 ~ Apr. 1993	Jul. 1994 ~ Jan. 1995
-Civil works	Apr. 1993 ~ Apr. 1995	Jul. 1994 ~ Dec. 1998
-Completion	Apr. 1995	Dec. 1998
③Project Cost		
Foreign currency		
• IM-7	¥294 million (¥294 million)	¥292 million (¥292 million)
• IM-14	¥605 million (¥605 million)	¥681 million (¥681 million)
• IM-22	¥632 million (¥632 million)	-
• Cost of countermeasures against rising prices	¥106 million (¥106 million)	-
• Contingency	¥164 million (¥164 million)	-
Total foreign currency portion	¥1,801 million (¥1,801 million)	¥973 million (¥973 million)
Local currency		
• IM-7	53 million Baht	61 million Baht
• IM-14	139 million Baht	156 million Baht
• IM-22	180 million Baht	-
• Cost of countermeasures against rising prices	34 million Baht	-
• Contingency	41 million Baht	-
• Land purchasing	912 million Baht	787 million Baht
• Tax	56 million Baht	-
Total local currency portion	1,415 million Baht	1,004 million Baht (¥3,212 million)
Total	¥9,018 million	¥4,185 million
ODA Loan portion	(¥2,184 million)	(¥973 million)
Exchange rate	1 Baht = ¥5.1 (as of June 1992)	1 Baht =¥3.2 (as of December 1998)

Note: 1) Figures in ( ) are values of ODA loan .
2) Table showing the breakdown by funding source for the 20 highway sector projects.

Site Map