

Summary of the Terminal Evaluation

1. Outline of the Project	
Country: The Republic of India	Project title: The Assistance for the Introduction of ITS related to Hyderabad Outer Ring Road Construction Project
Issue: Land Transport · Urban Transportation	Cooperation scheme: Technical Cooperation
Division in charge : Economic Infrastructure Department	Total cost (At the Terminal Evaluation): 272 million Japanese yen
Period of Cooperation	(R/D): January 2010 – June 2011
	(Extension): January 2010 – October 2013
	Partner Country's Implementing Organization: Hyderabad Growth Corridor Limited (HGCL) Supporting Organization in Japan: ALMEC CORPORATION, East Nippon Expressway Company Limited Related Cooperation: <ul style="list-style-type: none"> • Hyderabad Outer Ring Road Project (ODA Loan project) (Phase I signed on March 2008, Phase II signed on November 2008) • Special Assistance for Project Implementation for Hyderabad Outer Ring Road Project (September 2008 - May 2009) • The Assistance for the Introduction of ITS on Road Network in Hyderabad Metropolitan Area (August 2011 - January 2013)
1-1 Background of the Project Phase I and Phase II of the agreement of the ODA loan project entitled “ Hyderabad Outer Ring Road Project” were signed in March and November 2008 respectively between the governments of Japan, through the Japan International Cooperation Agency (JICA), and the Republic of India with the Hyderabad Growth Corridor Limited (HGCL) as executing agency. Although the Outer Ring Road (ORR) Phase II includes a component on the introduction of intelligent transportation systems (ITS) including electronic toll collection (ETC) system, HGCL does not have enough experiences for operating and maintaining highway with ITS. It is essential to transfer the technical skills and knowledge for HGCL in order to implement the Project effectively. In order to support the implementation of the ITS component, JICA conducted a Special Assistance for Project Implementation for Hyderabad Outer Ring Road Project from September 2008 to May 2009 and formulated the implementation plan and proposed an institutional setup to manage the ITS. Because high-level expertise in ITS is required, so far it has been extremely difficult for HGCL to handle the implementation of the project alone. Under the circumstance, JICA started the technical cooperation project titled “ The Assistance for the Introduction of ITS related to Hyderabad Outer Ring Road Construction Project” in February	

2010 in cooperation with HGCL. The Objectives of the Project are the following : 1. To conduct the survey for collecting toll and introducing the ITS, 2. To solve problems related to operation & maintenance (O&M) issues and preparation of detailed operation charts, 3. To prepare the tender of ITS components and institutional setup for optimal operation and management of toll collection system for the ORR, 4. To conduct trial experiments on ETC, 5. To assist the development of HTMS.

1-2 Contents of Cooperation

(1) Overall Goal :

By responding to increasing road traffic demands through the construction of the Outer Ring Road and major radial roads in the Hyderabad metropolitan area in India's southern state of Andhra Pradesh, traffic congestion in the city is eased and regional economic development is promoted.

(2) Project Purpose :

For the purpose of contributing toward smooth implementation and enhancing development effect of Hyderabad Outer Ring Road Construction Project, a smooth introduction of effective O&M (operation and management) system and ITS to the relevant organizations are achieved.

(3) Outputs :

- 1) By conducting necessary surveys/ studies regarding the optimal way of toll collection and smooth ITS introduction, problems related to operation & maintenance (O&M) issues and preparation of detailed operation charts are solved.
- 2) Setup for the smooth procurement of necessary ITS components are completed.
- 3) Institutional setup for optimal operation and management of toll collection system for the ORR is promptly and firmly completed, and preparation for toll collection system is completed.
- 4) Trial experiments on ETC are conducted, and necessary proposals regarding full-scale operation of ETC are made.

(4) Inputs (As of 30th April):

Japanese side:

Number of Japanese experts dispatched:17 Number of trainees dispatched in Japan:2

Local Operation Cost : 16,661,190 Rupee

Indian side:

Number of Counterparts:4(1 General Manager, 1 Assistant General Manager and 2 Traffic & Transportation Engineers)

Project office : Provided in the part of HMDA building

2. Outline of the Evaluation team

Japanese side	Team Leader	Mr. Yoshihiro KAKISHITA	Senior Advisor to the Director General, Economic Infrastructure Department, JICA Tokyo
	Cooperation Planning 1	Mr. Yusuke TSUMORI	Deputy Director, Transportation and ICT Division 3, Economic Infrastructure

			Department, JICA Tokyo	
	Cooperation Planning 2	Mr. Sanjeev MOHOLKAR	Principal Development Specialist, JICA India Office	
	Evaluation Analyst	Ms. Chiaki YAMADA	Pegasus Engineering Corporation	
Indian side	Mr. I. Samuel Anand KUMAR		Managing Director, HGCL	
	Mr. N. Surya Prakash REDDY		Chief General Manager, HGCL	
	Mr. B. Anand MOHAN		General Manager, HGCL	
Period of Evaluation	5 th August – 16 st August 2013		Type of Evaluation	Terminal Evaluation
3. Results of Evaluation				
<p>3-1 Project Achievement</p> <p><u>(1) Achievement of Project Purpose: Partially Achieved</u></p> <p>According to the results of the interviews with persons concerned to the Project, technical knowledge and skills have been transferred from the ITS Assistant Team (comprised of the Japanese experts and local consultants) to HGCL staffs to some extent. On the other hand, necessary documents for the tendering and operation of both TMS and HTMS have been prepared and the road map for establishment of TMS and HTMS on ward was prepared by HGCL. The preparation for establishment of ITS was almost completed and according to the implementation schedule, ETC trial will be started from December 2014 and HTMS operation will be from December 2015.</p> <p><u>(2) Achievement of Outputs</u></p> <p>< Output 1 > Fully Achieved</p> <p>The survey for setting the appropriate toll has been conducted in April and May in 2010. Results of the survey were analyzed and a model was developed to find an appropriate toll rate. ITS components have been reviewed, and the components to be introduced to the ORR have been selected. TMS includes ETC system and Touch & Go, and HTMS includes automatic incident detection system using video camera, emergency call box system, traffic information system that displays traffic information using on variable message sign.</p> <p>In order to promote Touch & Go and ETC, both Touch & Go and ETC cards were planned to be distributed to frequent users of the ORR. The detail plan for ETC trial has been prepared. The detailed schedule of ITS introduction prepared by HGCL with the assistance of the ITS Assistance Team. It will be updated by HGCL after the Termination of the Project.</p> <p>< Output 2 > <u>Almost</u> Achieved</p> <p>Draft tender documents for the procurement of TMS, TMS operation agency, HTMS, HTMS operation agency and ITS consultant were developed by the ITS Assistant Team and submitted to the HGCL after the confirmation. The setup for procurement of ITS components have been almost completed although it is not expected to be completed by the termination of the project.</p> <p>< Output 3 > Partially Achieved</p> <p>Establishment of toll collection system for the ORR is not completed yet. As the preparation to</p>				

establish the toll collection system, six bidders have been qualified for tendering of TMS. The tender evaluation has been carried out by HGCL with the assistance of the ITS Assistant Team and the recommendation was approved by the Technical Advisory Committees (TAC). However, TMS tender could not be finalized due to legal problems between HGCL and the tenderers. The draft TMS Operation Manuals and Forms were prepared by the ITS Assistance Team and submitted to HGCL in December 2012. The training was planned after TMS contractor and TMS operation agency have been selected. As both of them are not yet selected by HGCL, the training activities for HGCL staff and TMS operation agency staff have been cancelled.

Due to some external factors such as legal problems, institutional setup and preparation of toll management system are not expected to be completed by the termination of the project.

< Output 4 > Not Achieved

Technology of ETC system and Touch & Go was introduced and detail specification was explained to the HGCL by ITS Assistance Team. And guidance for the actual operation of TMS was conducted as per.

However, due to the legal problems between HGCL and the tenderers, the TMS contractor has not been selected. Therefore, the starting date to establish and operate the ETC is uncertain and the work toward full-scale operation of the ETC has not been completed.

(3) Possible achievement of Overall Goal: Difficult to measure the possible achievement

It is difficult to mention the indicator of fulfillment until we reach the terminal evaluation. The ORR is still under construction and it is supposed to be completed at the end of 2013. Ripple effects, which will be contributing to achieving the overall goal, have not been confirmed. It is necessary in essence to introduce and operate the ITS for achieving the overall goal upon the completion of the ORR construction.

3-2 Summary of evaluation result

(1) Relevance: Relevance is high in terms of Indian Government's policy, Japanese aid policy of Official Development Assistance (ODA) and needs in India.

Concerning the consistency with Indian Policies, in the 11th Five year plan (April 2007 to March 2012) and the 12th Five year plan (April 2012 to March 2017), development of road infrastructure is one of the focus/priority areas and also usage of ITS effectively is highlighted. Furthermore, the Government of Andhra Pradesh proposed one of major infrastructure facilities in Hyderabad city is an orbital linkage to smooth the traffic flow on the existing major arterials.

With respect to consistency with Japanese aid policy to India, the government has mentioned in the Country Assistance Plan and rolling plan for the India that construction of high standard roads with the ITS facilities is priority issue not only for efficient transport system but also for better living standard and better road environment. The government is also certain of an importance to provide a capacity development for those who operate and maintain roads with the ITS facilities for the sustainable operation of high standard roads.

(2) Effectiveness: The preparation necessary for ITS introduction has been completed but it is difficult to achieve the Project purpose at the terminal evaluation due to some external factors. Therefore, the effectiveness is moderate. If activities are implemented based on the implementation schedule for establishing TMS and HTMS, the Project purpose will be achieved even after the termination of the Project.

The preparation necessary for the ITS introduction has been completed. But the ITS has not established yet due to the legal procedure. Thus the Project purpose has not been fully achieved. Based on the project schedule prepared by HGCL, ETC trial will start from December 2014 and HTMS operation will be from December 2015.

Contribution of four Outputs to the achievement of the Project purpose is appropriate. the project logic of each output is also explicit and effective.

Factors which have hindered the Project purpose are the following.

- The human resource has not been appropriately allocated on the Indian side for conducting the project activities effectively and smoothly.
- Regarding the deliverable of floating of tender and finalization of agency on TMS, the finalization of TMS agency was abnormally delayed due to court litigation.

(3) Efficiency: The efficiency of the Project is relatively high from the extent of outputs generated. Some outputs have not been achieved due to external factors. However, preparation necessary for the introduction of the ITS is completed and the capacity of HGCL has been strengthened through the project implementation.

Concerning the achievement of Outputs, Outputs 1 and 2 have been almost achieved because the preparation necessary for the introduction of the ITS is completed. However, the Outputs 3 and 4 have been partially achieved. It is because the ITS has not established and not become operational yet, caused by the legal procedures of the ITS procurement.

As regards inputs of timing, quality and cost, these results have been confirmed through the interviews with persons concerned to the Project.

- Both the Indian and Japanese sides agreed that the well qualified Japanese experts were allocated to the Project and especially the allocation of experts specialized in Toll Collection Management and ITS Operation & Management acquired a high reputation. As a whole, the inputs from the Japanese side have produced the project outputs as expected.
- The legal procedure and time required for reviewing tender documents by the Indian side delayed the Project. In order to cope with changes of the schedule, the Project period was extended three times. Under such circumstances, the Japanese side revised the assignment schedule and dispatched the Japanese experts when their expertise was most required.
- HGCL should have been advised by the JICA/consultants while initiating the Project to have the requisite human resources to manage ITS projects. This dedicated team would have been assigned to the Project on a full time basis from the beginning. Such an arrangement, if implemented, would have promoted the staff' understanding of the ITS and HGCL could have gained the technology and knowhow of the design and procurement of the systems through the

project activities. Furthermore, staff who manages the project activities including scheduling should have been allocated by the HGCL. Since the middle of the project period, two full-time Traffic & Transportation Engineer staff have been allocated to the Project, which expanded the communication opportunities between the HGCL and the Japanese and contributed the progress of the Project activities.

(4) Impact: Although several positive impacts have been confirmed at the Terminal evaluation, it is hard to measure the possible achievement of the Overall goal. Negative impacts have not been confirmed.

It is difficult to assess the likelihood of achieving the Overall goal at the Terminal evaluation because the ORR is under construction. In order to achieve the Overall Goal in 3-5 years, the ORR construction has to be completed and both toll management system and highway traffic management system will have to be completed and function properly.

A number of positive impacts identified through the interviews and the Project Report are shown in the following. Negative impacts have not been created.

- ITS implemented by HGCL is limited to the ORR only. HMDA, who manages city roads in Hyderabad, was inspired by the ORR ITS project and decided to introduce the ITS into city road, which will help reduce traffic congestion and car accidents. It is confirmed, based on the interview with the project, that HMDA has initiated the formulation of the ITS introduction plan on the city roads.
- The premier institutes such as School of planning & architecture in Hyderabad introduced academic courses related to ITS into the curriculum because the institutes realized a necessity to raise persons specialized in the ITS, as the needs of ITS established has been rising.
- HGCL has initiated to take up new projects such as Vehicle Information and Communication System (VICS) and Road Numbering.

(5) Sustainability: The sustainability of the Project is moderate from four aspect as below.

< Political Aspects >

According to the interview with the Indian side, it is likely that the Government of India will hold the current policy and prioritize the ITS introduction on roads. It is also expected that HMDA will promote the establishment of ITS continuously in the future, as it has begun formulating the plan to establish ITS on the roads in the city.

< Organizational Aspects >

As the project went forward, HGCL has started realizing the importance of the ITS and staff has taken an initiative to implement the project activities. There is a challenge for HGCL to formulate a plan and implement activities based on the plan.

< Technical Aspects >

HGCL staff has learned a lot about the ITS and its components through the project activities. However, it can be said that their technical and knowledge level has not reached the point capable of applying their knowledge to the design of new system of different conditions.

< Financial Aspects >

According to the interview with the experts, the toll revenue is expected to be not sufficient to cover the operation and maintenance costs of the ITS and ORR for a prolonged period after the completion of the ORR.

3-3 Factors that promoted realization of effects

(1) Factors concerning to planning

None in particular.

(2) Factors concerning to the Implementation Process

The premier institutes such as School of planning & architecture in Hyderabad introduced academic courses related to ITS into the curriculum because the institutes realized a necessity to raise persons specialized in the ITS, as the needs of ITS established has been rising. Furthermore, HGCL has initiated to take up new projects such as Vehicle Information and Communication System (VICS) and Road Numbering.

3-4 Factors that impeded realization of effects

(1) Factors concerning to planning

Concerning the implementation system of the Project and operation management, preliminary meetings to let the HGCL understand the project details have not been sufficiently held so that HGCL's understanding for the Project was insufficient. HGCL, therefore, was not able to allocate the human resource into the Project appropriately and as a consequence, it caused the delay of the project.

(2) Factors concerning to the Implementation Process

Due to the prolonged tender evaluation caused by the matter of legal procedures between HGCL and tenderers, both TMS and HTMS contractor have not been selected yet. It caused difficulties to achieve the Project purpose during the Project.

3-5 Conclusion

- 1) The Project has addressed the dynamic situation with flexibility through the project period extended, such as the additional staff allocation for the tender evaluation and documents preparation, and the additional assistance relevant to the ITS operation were conducted according to the necessity. All the necessary tender documents have been developed for the introduction of ITS, including an operational aspect. Accordingly, it can be said that both Output 1 and 2 have been achieved.
- 2) Concerning the Output 3 and 4, due to the prolonged tender evaluation caused by the matter of legal procedures between HGCL and tenderers, the TMS contractor has not been selected yet. It resulted in disturbing the progress of the activities as planned. As a result, the achievement of Output 3 and 4 has been partially achieved.
- 3) ITS has not been introduced actually due to some external factors, however, the drafts of tender documents have been prepared, the capacity of HGCL has been strengthened through

the project implementation and the road map for establishment of ITS was prepared by HGCL. The preparation for the introduction of ITS into the ORR has been mostly developed.

3-6 Recommendations

- 1) To modify the tender documents of HTMS and if necessary TMS by the end of the Project
- 2) To utilize the knowledge accumulated through the Project and the tender documents developed by the Project to the procurement process in the JICA loan assistance project entitled “Hyderabad Outer Ring Road Construction Project”.
- 3) Regarding smooth introduction of HTMS the various activities related to tendering and selection of operation agency should be carried out timely by the appropriate stakeholders.
- 4) To continuously acquire the knowledge and experience of the ITS for HGCL staff through the implementation of the project.
- 5) To use of external resource, for example, creating TAC and asking their comments on the technical issues, to supplement the limited capability of HGCL staff and strengthen the technical capability of HGCL.
- 6) To arrange, recruit and train the appropriate staff who can manage the project and coordinate with other stakeholders.
- 7) To determine the new toll rate after the consideration of current toll rate and the actual traffic volume after the TMS has been put into operation. Likewise, to prepare the budget plan for the next five years for securing the necessary budget for the ORR operation.

3-7 Lesson Learned

In order to achieve the outputs, it is essential that the approvals for the each project activity are done timely and smoothly especially in the Project. On the other hand, the high-level expertise and the coordination among various stake holders concerned with the traffic administration are required in the Project. Concerning HTMS, it seems to be difficult for the Indian side to give approval for the each procurement process. Therefore, it seems to have been effective for the accomplishment of the project that the coordination committee of the Indian side has been strengthened and the technical assistance necessary for supporting the decision-making has been provided.