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Report No. 14711

PROJECT COMPLETION REPORT

REPUBLIC OF KOREA

**TAEГУ URBAN TRANSPORT PROJECT
(LOAN 2908-KO)**

JUNE 28, 1995

**Infrastructure Operations Division
Country Department I
East Asia and Pacific Region**

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CURRENCY EQUIVALENTS

Currency Unit	=	Won (W)
US\$1.00	=	W 800 (September 1987)
US\$1.00	=	W 780 (May 1993)

FISCAL YEAR

January 1 - December 31

MEASURES AND EQUIVALENTS

Metric System

ABBREVIATIONS

CBD	-	Central Business District
KAIST	-	Korea Advanced Institute for Science and Technology
p.p.a.	-	percent per annum
TCG	-	Taegu City Government
TSM	-	Transportation system management
VOC	-	Vehicle operation cost

June 28, 1995

Office of Director-General
Operations Evaluation

MEMORANDUM TO THE EXECUTIVE DIRECTORS AND THE PRESIDENT

SUBJECT: Project Completion Report on Korea
Taegu Urban Transport Project (Loan 2908-KO)

Attached is the Project Completion Report (PCR) on the Korea: Taegu Urban Transport project (Loan 2908-KO, approved in FY88), prepared by the East Asia and Pacific Regional Office. The Borrower did not contribute Part II. The Loan for US\$30 million equivalent was closed on December 31, 1993, as planned.

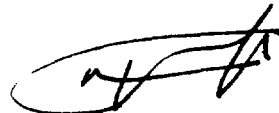
The loan was the second by the Bank to support urban transport in Korea. This project had a well-focused scope and objectives. The objectives were to assist the city of Taegu, a large regional center in South Eastern Korea to (a) increase the efficiency and capacity of the city's transportation system through the application of transportation system management measures and the construction of a major urban expressway with associated links; and (b) build the institutional capacity to plan, design and implement traffic and safety improvements to deal with future transportation problems. New infrastructure work, intersection improvements, pedestrian facilities and traffic signals were implemented; the project also included land acquisition, bridges and consultant services for construction supervision. Technical assistance included equipment, training, and advisory services. Due to unexpected escalation of land prices in Korea, the construction of three access roads was postponed to be completed using the city's own resources at a later date. The price increase of land did lower the project's economic rate of return (ERR) from estimated 37 percent to 21 percent.

The PCR gives an adequate report on project execution. There is, however, no information on supervision. This is an important omission because the Borrower did successfully manage resettlement and land acquisition in spite of an unexpected four-fold increase in land prices. This caused a one year delay in physical execution but the project was still closed as planned. The Borrower appears to have anticipated changes which affected project implementation, prepared for them, and took well-timed appropriate actions. What factors contributed to such a dynamic management are of general interest to the Bank and should have been investigated or reported.

The outcome is rated as satisfactory, its sustainability as likely, and its impact on institutional development as substantial.

No audit is planned.

Attachment



REPUBLIC OF KOREA

TAEGU URBAN TRANSPORT PROJECT (LOAN 2908-KO)

PROJECT COMPLETION REPORT

Contents

	<u>Page</u>
Preface	i
Evaluation Summary	ii
PART I. PROJECT REVIEW FROM THE BANK PERSPECTIVE	
Project Identity	1
Background	1
Project Objectives and Description	2
Project Design and Organization	3
Project Implementation	3
Project Results	5
Project Sustainability	5
Bank Performance	6
Borrower Performance	6
Project Relationships	6
Consulting Services	6
Project Documentation and Data	6
Lessons Learned	6
PART II. BORROWER REVIEW OF THE PROJECT - The Borrower did not provide Part II	
PART III. STATISTICAL INFORMATION	
Table 1: Related Bank Loans	10
Table 2: Project Timetable	11
Table 3: Loan Disbursements	
A. Cumulative Estimates and Actual Disbursements	12
B. Final Disbursement Allocation by Category	13
Table 4: Project Implementation Schedule	14
Table 5: Project Cost and Financing	
A. Cost By Component	15
B. Project Financing	16
C. Detailed Project Cost (Actual)	17
D. Detailed Land Acquisition and Compensation	18
Table 6: Economic Rate of Return (ERR) Performance Data	19
Table 7: Status of Compliance with Loan Covenants	20
Table 8: Estimated Completion Costs	21

REPUBLIC OF KOREA
TAEGU URBAN TRANSPORT PROJECT (LOAN 2908-KO)
PROJECT COMPLETION REPORT

Preface

This is the Project Completion Report (PCR) for the Taegu Urban Transport Project, for which Loan 2908-KO, in the amount of US\$30 million equivalent, was approved on February 9, 1988, and became effective on November 15, 1988. The Loan was fully disbursed by October 1, 1993, and was closed on December 31, 1993.

The PCR was prepared by the Infrastructure Operations Division, Country Department I, East Asia and Pacific Region. The Report's findings are based on a review of the documents in the project files at the World Bank and data provided by the Borrower.

REPUBLIC OF KOREA**TAEGU URBAN TRANSPORT PROJECT (LOAN 2908-KO)****PROJECT COMPLETION REPORT****Evaluation Summary****Background and Objectives**

1. Urbanization throughout Korea has progressed very rapidly, placing very heavy demands on the major cities. As a part of the total national population, the urban population grew from 50 percent in 1970, to 79 percent in 1990. By 1985, Seoul, Inchon and the surrounding Kyonggi Province in the northwest accounted for about 50 percent of manufacturing employment, 50 percent of urban population and 40 percent of total population, while Pusan, Taegu and Kyong Buk and Kyong Nam Provinces in the southeast accounted for another 40 percent of manufacturing employment, 30 percent of urban population and 30 percent of total population. During the 1980s, however, the rapid urban growth began to shift from Seoul to the regional cities. During the last decade, the populations of Taegu, Inchon and Kwangju grew up to 3.2 percent per annum, while the populations of Seoul and Pusan increased at 1.9 and 1.5 percent per annum, respectively, and the Korea's overall population growth rate declined to less than 1 percent per annum.

2. The Bank's involvement in urban transportation in the Republic of Korea began in 1980, in response to a Government request for Bank assistance to review the urban transport situation in major cities. The mission identified the need for improvement in traffic and transport management, urban transport policy formulation, strengthening of key institutions and improvement of coordination among various national and local governmental institutions. The Government subsequently undertook Transportation Improvement Studies, financed by the Bank, in the major cities (Seoul, Pusan, Taegu, Kwangju and Taejon), which formed the basis for subsequent urban transportation projects in Korea. The first such project was implemented in Seoul (the Seoul Urban Transportation Project, Loan 2514-KO, approved in May, 1985, closed in June 1992). Taegu City, with a population of 2.1 million (in 1986), was selected as the second city for the Bank-supported urban transport project. Taegu was the third largest city in Korea and a major regional center in Kyong Buk Province in the Southeast.

3. The project was designed to assist TCG to manage future traffic problems by supporting two of TCG's principal transport-related objectives:

- (a) to increase the efficiency, capacity and safety of the existing transportation system in Taegu through the introduction and applications of transportation system management (TSM) techniques and the construction of a major urban expressway with associated links; and
- (b) to build the institutional capacity to plan, design and implement traffic and safety improvement, and deal with future transportation problems.

Implementation Experience

4. Implementation of the project was satisfactory. The Construction and Housing Bureau carried out the civil works and land acquisition components of the project. The TSM component was implemented by the Traffic Police Section and the Transportation Planning and Management Division. The project was implemented over a five year period, with the loan becoming effective on November 15, 1988, and closed on December 31, 1993. The implementation schedule slipped due to delays in land acquisition, which also caused a large increase in the overall cost of the project. Disbursements were somewhat off the estimated disbursement schedule due to these delays. However, the project loan was fully disbursed as of October 1, 1993, and was closed on December 31, 1993, as scheduled at appraisal.

5. The right-of-way required for the project involved the acquisition of 179,965 square meters of land and the relocation of 1,990 families (7,090 people). Land acquisition for Shinchon started in 1984, with the proceedings governed by the 1975 "Special Law on Acquisition and Compensation of Lands for Public Use", which satisfied Bank resettlement requirements. These procedures were, furthermore, carried out in accordance with agreements reached at appraisal and negotiations. The estimated total land acquisition cost for the project at appraisal was Won 37.7 billion (US\$47.1 million) including the relocation of 2,300 families. However, land prices throughout Korea increased dramatically more than expected. In 1990, TCG decided to extend the project implementation schedule by one year to the end of 1993, which coincided with the loan closing date. During implementation of the land acquisition component, TCG was successful in paying a fair and timely compensation for both property and loss of livelihood, and even provided alternative housing. TCG paid US\$170 million (or 60% of the actual total project cost) for the land acquisition and compensation, which was almost quadruple the estimated costs at appraisal (US\$45.5 million).

Results

6. Overall, the project has been a success. While some of the cross roads of Shinchon Expressway were postponed, the project made a substantial contribution toward achieving TCG's goals for an increase in traffic efficiency, capacity and safety in Taegu through the introduction and application of TSM techniques and the construction of Shinchon Expressway with its associated links. Qualitative and quantitative indicators show that the TSM and safety investments, together with Shinchon Expressway, had a city-wide impact, resulting in significantly reduced delays and accident rates. This project also created a significant institutional benefit by strengthening TCG's transportation planning and traffic management capability.

7. The economic rates of return (ERRs) for the project were estimated at appraisal to be 25% with a benefit in vehicle operations costs (VOC) only, and 37% with both benefits in VOC and the value of time saved. Traffic volumes increased slightly more than those predicted at appraisal, with estimated annual average rate increases of 8.11 percent between 1988-1996, and 6.82 percent from 1996 on, which pushed up the benefits. Bid prices were also lower than expected. However, benefits from lower bid prices and increased traffic were more than offset by the increased land acquisition and compensation costs, which quadrupled from US\$45.5 million to US\$170 million doubling the project's total cost from US\$145.7 million to US\$269.3 million. This resulted in lower ERRs than expected at appraisal -- 12.3% for the case with VOC only and 20.8% for the case with VOC and time savings.

Project Sustainability

8. The Bank-financed sub-projects are likely to maintain acceptable levels of net benefit throughout their economic life. TCG has been providing a proper budget for maintenance of the Shinchon

Expressway. The expressway and bridges financed by the Bank provide access to the expressway, which created an essential capacity for diverting the north-south traffic from trunk city streets and significantly eased traffic congestion in the city. The 6-lane Shinchon Expressway currently provides sufficient capacity to accommodate the 110-120 thousand vehicles per day expected by the year 2008, and has diverted enough traffic from the central business district (CBD) to have allowed the TSM measures to be fully effective. On the institutional side the main risk is that the TSM measures would not be adjusted to new traffic conditions. However, there is every indication that TSM has been adopted and will continue to gain force in Taegu. Even during implementation, the TSM were adapted to changing circumstances, providing useful experience for future changes expected to arise from the construction of a subway system.

9. One threat to sustainability is that traffic volumes continue to increase faster than forecasts, and have potential to outstrip capacity, leading to a degradation of any TSM strategy as inner-city roads become over saturated. However, subway construction works are underway, which, upon completion, should absorb some traffic and will contribute to securing the lasting efficiency of the TSM efforts in the city, even for future traffic. This is especially true since, once public transportation is in place, demand-side measures to control traffic volumes become more feasible. The benefits from safety improvements would also increase after the completion of the subway system as intersection improvements including channelization, markings and pedestrian facilities, were designed to reduce accidents for efficient and non-saturated traffic flows.

Lessons Learned

10. The major risk identified at appraisal was that of potential delays related to the relocation of an estimated 2,000 families. The risk was not considered great because, "experience indicates that assessment and payment of compensation to affected persons is done in a fair and timely manner in Korea." What was not predicted was that the dramatic increase in the cost of land lead to delays in coming up with the funds to finance fair compensation. The appraisal was correct in its assessment that TCG had proper resources to recover the hike in the project cost because the main sources of revenue for TCG were the acquisition tax (based on land purchases), registration tax (also based on land purchases) and property tax (based on assessed value of fixed assets). However, as it turned out, the land acquisition and compensation costs were nearly quadrupled, resulting in a significant underestimation of the required cost and time, and TCG had to postpone the construction of the three cross roads of Shinchon Expressway. The Bank needs to ensure that the cost and scheduling of land acquisition are carefully estimated at appraisal when projects include land acquisition as a controlling element of the implementation.

REPUBLIC OF KOREA

TAEGU URBAN TRANSPORT PROJECT (LOAN 2908-KO)

PROJECT COMPLETION REPORT

PART I: PROJECT REVIEW FROM THE BANK'S PERSPECTIVE

Project Identity

Project Name	:	Taegu Urban Transport Project
Loan Number	:	2908-KO
RVP Unit	:	East Asia and Pacific
Country	:	Republic of Korea
Sector	:	Transport
Subsector	:	Highway

Background

1. Urbanization throughout Korea has progressed very rapidly, placing very heavy demands on the major cities. As a part of the total national population, the urban population grew from 50 percent in 1970, to 79 percent in 1990. By 1985, Seoul, Inchon and the surrounding Kyonggi Province in the northwest accounted for about 50 percent of manufacturing employment, 50 percent of urban population and 40 percent of total population, while Pusan, Taegu and Kyong Buk and Kyong Nam Provinces in the southeast accounted for another 40 percent of manufacturing employment, 30 percent of urban population and 30 percent of total population. During the 1980s, however, the rapid urban growth began to shift from Seoul to the regional cities. During the last decade, the populations of Taegu, Inchon and Kwangju grew up to 3.2 percent per annum, while the populations of Seoul and Pusan increased at 1.9 and 1.5 percent per annum, respectively, and the Korea's overall population growth rate declined to less than 1 percent per annum.

2. Korea's rapid economic development and urbanization out-paced the construction of capacity of transport infrastructure in most major cities. With the continuing rise in income and living standards, residential growth in suburbs, and the development of a local car manufacturing industry, vehicle ownership in Korea increased from 0.38 million in 1983 to 3.5 million in 1993, a nine-fold increase within a decade. The total number of passenger trips by all modes rose over seven times from 1971-92 and about five and one-half times for passenger kms. However, highways had increased passenger trips by 40 times and freight-tons by 19 times in terms within the same period.

3. The Bank's involvement in urban transportation in the Republic of Korea began in 1980, in response to a Government request for Bank assistance to review the urban transport situation in major cities. The mission identified the need for improvement in traffic and transport management, urban transport policy formulation, strengthening of key institutions and improvement of coordination among various national and local governmental institutions. The Government subsequently undertook Transportation Improvement Studies, financed by the Bank, in the major cities (Seoul, Pusan, Taegu, Kwangju and Taejon), which formed the basis for subsequent urban transportation projects in Korea. The first such project was implemented in Seoul (the Seoul Urban Transportation Project, Loan 2514-KO,

approved in May, 1985, closed in June 1992). The Seoul Urban Transportation Project was designed to finance the construction of urban transport infrastructure and introduce Transport System Management (TSM) techniques. The concept of TSM was successfully introduced into Korea through the project, although it remained only partially embraced due to its novelty, limited professional expertise in how to manage the systems, and the tendency for public agencies to emphasize capital investment. The beneficial impacts of TSM, which is dependent upon reasonable traffic volumes, were fewer than originally expected due to constant increases in the traffic volume in the city, which out-paced the construction of new capacity.

4. At the same time, Taegu continued to play an important regional role, with population growing at 2.4 percent per annum, overall employment up 5.1 percent per annum, and employment in service industries increasing by 5.9 percent per annum. At the project identification in 1986, the population of the City was 2.1 million and was expected to increase by 3.04 percent per annum. Between 1980 and 1986 the number of vehicles in Taegu increased by 17 percent per annum and the number of cars more than tripled, which resulted in an increase of over 50 percent in traffic volume in the City, especially in the Central Business District (CBD), and decreasing operating speeds and severe congestion. Vehicle ownership was very high in Taegu at almost 12 percent of the population, and was expected to increase by 10.3 percent per annum. By way of comparison, vehicle ownership in Seoul and Pusan were 11.2 percent and 7.6 percent, respectively, and the national average was about 7.9 percent.

5. In light of these growing urban transport issues, and based on recommendations of the previous Bank-financed study, Taegu City Government (TCG) created a Transportation Planning and Management Division to consolidate traffic planning and develop a four-year program of traffic management and public transport improvement measures. TCG decided upon a two-phased approach. In the short term, efficiency and safety improvements of the existing road network would be sought through the introduction of TSM techniques, and, in the medium term, the road capacity would be increased through the construction of an urban expressway, the Shinchon Expressway. The Shinchon Expressway, which would run along Shinchon River from north to south of the city, was expected to provide the most effective bypass to the CBD and relieve traffic congestion in the vicinity of the industrial area situated in the northern part of the city. While the Shinchon Expressway would provide a much needed north-south road link within the city, it was also expected that the construction of two additional east-west bridges over the Shinchon River would alleviate city-wide traffic problems caused by traffic stuck trying to cross the Shinchon River's over burdened bridge network.

Project Objectives and Description

6. Objectives. The project was designed to assist TCG to manage future traffic problems by supporting two of TCG's principal transport-related objectives:

- (a) to increase the efficiency, capacity and safety of the existing transportation system in Taegu through the introduction and applications of TSM techniques and the construction of a major urban expressway with associated links; and
- (b) to build the institutional capacity to plan, design and implement traffic and safety improvement, and deal with future transportation problems.

7. Project Description. The major components of the project were:
- (a) Major Road Investments
Land acquisition and construction of around 9.5 km of the Shinchon Expressway and connecting roads and bridges, and consultant services for construction supervision;
 - (b) TSM and Safety Improvements
Construction of intersection improvements, channelization, markings, and pedestrian facilities, and the installation of traffic signals; and
 - (c) Institutional Development
Advisory services, training and equipment.

Project Design and Organization

8. The project was a continuation of the Bank's efforts in the urban transport subsector to assist the Government to maintain the efficiency of Korea's major cities not only through the construction of new roads but also through better utilization of the existing road network by encouraging use of TSM techniques, and establishing and strengthening transportation planning capabilities in the cities.

9. Taegu City Government, the Borrower, is an independent legal entity with the status of a Direct Jurisdictional City, and its agencies prepared and implemented the project. Construction of the city infrastructure was carried out by the Road Division of the Construction and Housing Bureau, while the TSM component was implemented by the Traffic Police Section and the Transportation Planning Management Division. Overall coordination of the project and liaison with the Bank was provided by the Director of the Planning and Management Bureau, who reported directly to the Mayor. The design proved efficient in terms of supervision costs, averaging 5.6 staff weeks per year for the project.

10. Based, in part, on the experience gained in the Seoul Urban Transport Project, the project relied on the complimentary strategy of increased capacity and transport efficiency management. While TSM was necessary to get the most out of the existing network, it was not sufficient since, as in the Seoul case, over saturated roads would not yield the full benefits. Similarly, simply expanding road capacity by constructing the Shinchon Expressway would not solve the congestion problems of the CBD. Together, however, it was anticipated that the diversion traffic away from the CBD would both ease inner-city traffic congestion and to allow TSM measures to take full effect.

Project Implementation

11. Implementation of the project was satisfactory. The Construction and Housing Bureau carried out the civil works and land acquisition components of the project. The TSM component was implemented by the Traffic Police Section and the Transportation Planning and Management Division. The project was implemented over a five year period, with the loan becoming effective on November 15, 1988, and closed on December 31, 1993. The implementation schedule slipped due to delays in land acquisition, which also caused a large increase in the overall cost of the project (para. 13). Disbursements were somewhat off the estimated disbursement schedule due to these delays. However, the project loan was fully disbursed as of October 1, 1993, and was closed on December 31, 1993, as scheduled at appraisal.

12. The implementation of the civil works component of the project was satisfactory. The construction work itself proceeded without major incident, with those problems that arose being solved without undue delay or excessive cost. Civil works for Shinchon Expressway was the largest component, involving over 70% of the civil works costs, and was divided into five contract packages. They were procured through international competitive bidding (ICB), but due to the very competitive and efficient local construction industry, all were let with local contractors. Civil works for two bridges were procured through local competitive bidding (LCB). The implementation of three access roads was postponed and, thus, civil works for these roads were not implemented (para. 15). Construction of Chungdong Bridge started as early as March, 1988, which was only one month after the project was approved by the Board. All civil works were finished by June 13, 1993, except for the three postponed crossroads.

13. The right-of-way required for the project involved the acquisition of 179,965 square meters of land and the relocation of 1,990 families (7,090 people). Land acquisition for Shinchon started in 1984, with the proceedings governed by the "Special Law on Acquisition and Compensation of Lands for Public Use", established in 1975. The Bank accepted the procedures in its appraisal of the project. Under this law, TCG's Construction and Housing Bureau made initial surveys and investigations, and prepared initial valuations of compensation payable for property, loss of livelihood, and relocation expenses. These were forwarded to TCG's Gu Offices for verification and discussion with the affected persons. These procedures progressed, in general, without major difficulty. There were few disputes; those that did arise were eventually settled and there are no outstanding claims.

14. The estimated total land acquisition cost for the project at appraisal was Won 37.7 billion (US\$47.1 million) including the relocation of 2,300 families. However, land prices throughout Korea increased dramatically more than expected. In 1990, TCG re-estimated the land acquisition costs for Shinchon Expressway at W 91 billion (US\$114.0 million -- or about half of the increased total project cost.) To defer expenditures to meet the city's available funding, TCG decided to extend the project implementation schedule by one year to the end of 1993, which coincided with the loan closing date. During implementation of the land acquisition component, TCG was successful in paying a fair and timely compensation for both property and loss of livelihood, and even provided alternative housing. TCG paid US\$170 million (or 60% of the actual total project cost) for the land acquisition and compensation, which was almost quadruple the estimated costs at appraisal (US\$45.5 million). Further, TCG issued 437 tickets for families to obtain new apartment houses.

15. In February, 1993, TCG proposed to postpone the construction of the three cross roads of Shinchon Expressway: Second Taebong Bridge - Namguchong; Chilson PB - Shinchon Road; and Chungdong Bridge-Bondok School. This postponement was due to financial constraints in meeting the high costs of land acquisition and displacement of an additional 1,500 people. The Bank concurred with the postponement. The works will likely be completed using TCG's own resources at a future date. Since displacement and relocation of families affected by the project is a matter of deep concern, the Bank should assure itself that future activities will continue to be carried out in accordance with procedures agreed between the Bank and TCG.

16. TCG, with a flexible implementation schedule, successfully carried out the TSM and Safety Improvement component of the project. This component included civil works for intersection improvement and channelization, goods for traffic signals and related equipment, and technical assistance and training. All items in this component were procured using TCG's own resources. Since traffic conditions had been changing with the growth in vehicles and completion of Shinchon Expressway, TCG reviewed and modified the designs for the improvements in 1991 and beyond. This extended the

implementation of this component to 1993, while it was expected to be completed by 1991 at appraisal. TSM components were successfully completed and considered a pioneering initiative in Korea with the large-scale introduction of TSM strategies to improve the safety and capacity of the urban street system.

17. Consulting services and technical assistance for this project were obtained by TCG, using its own resources. These included consulting services for supervision of construction and TSM design. Training on TSM was carried out at the early stages of the project to apply obtained expertise and experience into designing the TSM.

Results

18. Overall, the project has been a success. While some of the cross roads of Shinchon Expressway were postponed, the project made a substantial contribution toward achieving TCG's goals for an increase in traffic efficiency, capacity and safety in Taegu through the introduction and application of TSM techniques and the construction of Shinchon Expressway with its associated links. Qualitative and quantitative indicators show that the TSM and safety investments, together with Shinchon Expressway, had a city-wide impact, resulting in significantly reduced delays and accident rates. This project also created a significant institutional benefit by strengthening TCG's transportation planning and traffic management capability.

19. The economic rates of return (ERRs) for the project were estimated at appraisal to be 25% with a benefit in vehicle operations costs (VOC) only, and 37% with both benefits in VOC and the value of time saved. Traffic volumes increased slightly more than those predicted at appraisal, with estimated annual average rate increases of 8.11 percent between 1988-1996, and 6.82 percent from 1996 on, which pushed up the benefits. Bid prices were also lower than expected. However, benefits from lower bid prices and increased traffic were more than offset by the increased land acquisition and compensation costs, which quadrupled from US\$45.5 million to US\$170 million doubling the project's total cost from US\$145.7 million to US\$269.3 million. This resulted in lower ERRs than expected at appraisal -- 12.3% for the case with VOC only and 20.8% for the case with VOC and time savings.

Project Sustainability

20. The Bank-financed sub-projects are likely to maintain acceptable levels of net benefit throughout their economic life. TCG has been providing a proper budget for maintenance of the Shinchon Expressway. The expressway and bridges financed by the Bank provide access to the expressway, which created an essential capacity for diverting the north-south traffic from trunk city streets and significantly eased traffic congestion in the city. The 6-lane Shinchon Expressway currently provides sufficient capacity to accommodate the 110-120 thousand vehicles per day expected by the year 2008, and has diverted enough traffic from the CBD to have allowed the TSM measures to be fully effective. On the institutional side the main risk is that the TSM measures would not be adjusted to new traffic conditions. However, there is every indication that TSM has been adopted and will continue to gain force in Taegu. Even during implementation, the TSM were adapted to changing circumstances, providing useful experience for future changes expected to arise from the construction of a subway system.

21. One threat to sustainability is that traffic volumes continue to increase faster than forecasts, and have potential to outstrip capacity, leading to a degradation of any TSM strategy as inner-city roads become over saturated. However, subway construction works are underway, which, upon completion, should absorb some traffic and will contribute to securing the lasting efficiency of the TSM efforts in the city, even for future traffic. This is especially true since, once public transportation is in place, demand-

side measures to control traffic volumes become more feasible. The benefits from safety improvements would also increase after the completion of the subway system as intersection improvements including channelization, markings and pedestrian facilities, were designed to reduce accidents for efficient and non-saturated traffic flows.

Bank Performance

22. Bank performance was satisfactory. At the operational level, Bank staff contributed to the success of the Project by recognizing TCG, especially the Construction and Housing Bureau, as mature and capable institutions and enabling them to play a new role. Bank staff kept this focus throughout the project, even when confronted with the sudden increase of the land acquisition and compensation costs.

Borrower Performance

23. The Borrower performed well during the challenging period of unanticipated rapid economic growth and sudden increase in land prices, anticipating each phase ahead of project implementation, preparing for it, and making necessary changes when the situation demanded.

24. The Borrower also complied with agreements reached at negotiations and performed well in achieving project objectives. TCG showed no significant variation in civil works between the expenditure program and the actual appropriation. Disbursement was 100% of the planned expenditure. However, the requirement to supply the Bank with annual audit reports was not complied with in a timely manner.

Project Relationships

25. The Bank and the Borrower maintained a good relationship throughout the project's life cycle, where the changing conditions (between anticipated and actual economic performance) required their joint effort, mutual respect and flexibility. The introduction of comprehensive TSM was a new challenge to the Bank and TCG staff and turned out to be a success. The Bank's recognition of TCG's institutional capabilities might have created a favorable framework and contributed to the quality of the communication between the parties.

Consulting Services

26. All the consultants engaged under the project appear to have performed well. In general, supervision was considered efficient and the quality of work was also good.

Project Documentation and Data

27. All the basic documents needed to prepare the PCR were available within the Division and feasibility study reports were available for the performance evaluation of the Project. In general, they were clear and adequate.

Lessons Learned

28. The major risk identified at appraisal was that of potential delays related to the relocation of an estimated 2,000 families. The risk was not considered great because, "experience indicates that assessment and payment of compensation to affected persons is done in a fair and timely manner in Korea." What was not predicted was that the dramatic increase in the cost of land could lead to delays in coming up with the funds to finance fair compensation. The appraisal was correct in its assessment

that TCG had proper resources to recover the hike in the project cost because the main sources of revenue for TCG were the acquisition tax (based on land purchases), registration tax (based on land purchases) and property tax (based on assessed value of fixed assets). However, as it turned out, the land acquisition and compensation costs were nearly quadrupled, resulting in a significant underestimation of the required cost and time, and TCG had to postpone the construction of the three cross roads of Shinchon Expressway. The Bank needs to ensure that the cost and scheduling of land acquisition are carefully estimated at appraisal when projects include land acquisition as a controlling element of the implementation.

REPUBLIC OF KOREA
TAEGU URBAN TRANSPORT PROJECT (LOAN 2908-KO)
PROJECT COMPLETION REPORT

PART II: BORROWER REVIEW OF THE PROJECT

(The Borrower did not provide Part II)

REPUBLIC OF KOREA
TAEGU URBAN TRANSPORT PROJECT (LOAN 2908-KO)
PROJECT COMPLETION REPORT

PART III: STATISTICAL INFORMATION

REPUBLIC OF KOREA
TAEGU URBAN TRANSPORT PROJECT (LOAN 2908-KO)

PROJECT COMPLETION REPORT

Table 1: Related Bank Loans

Loan	Purpose	Year of Approval	Status	Comments
Highway Project (Ln. 769-KO)	To construct 372 km of national highways between Chonju and Pusan; feasibility studies and detailed engineering of 1,400 km and 1,100 km, respectively; a highway maintenance study and establishment of a pilot maintenance organization and purchase of highway maintenance equipment.	1971	Closed	PCR issued: PPAR No. 3045 of June 1980
Second Highway Project (Ln. 956-KO)	To assist the Government's 1972-76 road construction and paving program and to expand road maintenance organization. To construct national highways from Saemal to Gangreung (97 km) and Gangreung to Mukho (33 km); pave and improve 634 km of national highways; procure maintenance equipment and carry out feasibility studies and detailed engineering of 1,000 km of national and provincial roads.	1974	Closed	PCR issued: PPAR No. 3045 of June 1980
Third Highway Project (Ln. 1203-KO)	To cater for growing traffic on the highway system by extending the network of all-weather paved highways (800 km) between the main centers of population and carry out feasibility studies and detailed engineering (1,200 km) to prepare future projects.	1976	Closed	PCR issued: PPAR No. 5024 of April 1984
Fourth Highway Project (Ln. 1640-KO)	To assist in improving the highway system by extending the network of paved highways by some 1,230 km and by preparing a program for improving the maintenance and development of the provincial and county (gun) road system.	1979	Closed	PCR issued: PPAR No. 5450 of February 1985
Provincial and County Roads Project (Ln. 2228-KO)	To assist the Borrower to improve some 1,000 km of county (gun) or tertiary network roads throughout the country and to establish and equip appropriate maintenance organizations for the provincial and country road networks.	1982	Closed	PCR issued: PPAR No. 8372 of February 1990
Highway Sector Project (Ln. 2392-KO)	To assist the government in increasing efficiency in its highway sector through improvement in investment planning, transport regulation and pricing, and energy conservation.	1984	Closed	PCR issued: PPAR No. 9243 of December 1990
Seoul Urban Transportation Project (Ln. 2514-KO)	To construct urban transport infrastructure and introduce Transport System Management (TSM) techniques along selected transport corridors and in the Central Business District of Seoul Special City, as well as to preserve and strengthen public transport and promote institutional development of the Seoul Metropolitan Government and the Traffic Police Department.	1985	Closed	PCR submitted to OED on March 31, 1993.
Kyonggi Regional Transport Project (Ln. 2905-KO)	To help increase the efficiency of transport in the Kyonggi Region by: (a) physically improving the transport infrastructure in two corridors; (b) supporting the ongoing process of coordination of transport investment planning in the region; (c) supporting the government's commitment to conduct a Traffic Management Study in the secondary cities served by Bank investment; and (d) supporting the preparation of a comprehensive transport investment program.	1988	Closed	PCR No. 12230 of August 5, 1993.
Road Improvement Project (Ln. 3061-KO)	The project was designed to support the Government's Sixth Plan, to complete some initiatives begun under previous Bank-assisted projects and to help to increase transport capacity during the Sixth Plan period (1987-91) to support three principal road-related Government objectives: (a) enhancing transport efficiency by upgrading the surface and alignment of existing roads and by improving road maintenance and operations; (b) expanding traffic capacity by widening roads in corridors with high transport demand; and (c) increasing traffic safety through a number of measures, including safety-conscious design of project facilities, modification of design standards and practices, where appropriate, and physical improvement of known hazardous road locations.	1989	PCR under preparation	PCR under preparation

REPUBLIC OF KOREA
TAEGU URBAN TRANSPORT PROJECT (LOAN 2908-KO)

PROJECT COMPLETION REPORT

Table 2: Project Timetable

Item	Date Planned	Actual Date
Identification	NA	1986
IEPS	NA	Oct. 7, 1986
Preappraisal	NA	Nov. 23, 1986
Appraisal Mission	Aug. 1, 1987	Jul. 21, 1987
Yellow Cover	Oct. 1, 1987	Aug. 31, 1987
President's Report	NA	NA
Loan Negotiation	Nov. 15, 1987	Nov. 13, 1987
Board Approval	Dec. 15, 1987	Feb. 9, 1988
Loan Signature	NA	Sep. 13, 1988
Loan Effectiveness	Jan. 15, 1988	Nov. 15, 1988
Loan Closing	Dec. 31, 1993	Dec. 31, 1993
Loan Completion	Jun. 30, 1993	Oct. 1, 1993
First Supervision	NA	Nov. 18, 1988
Last Supervision	NA	Sep. 2, 1993

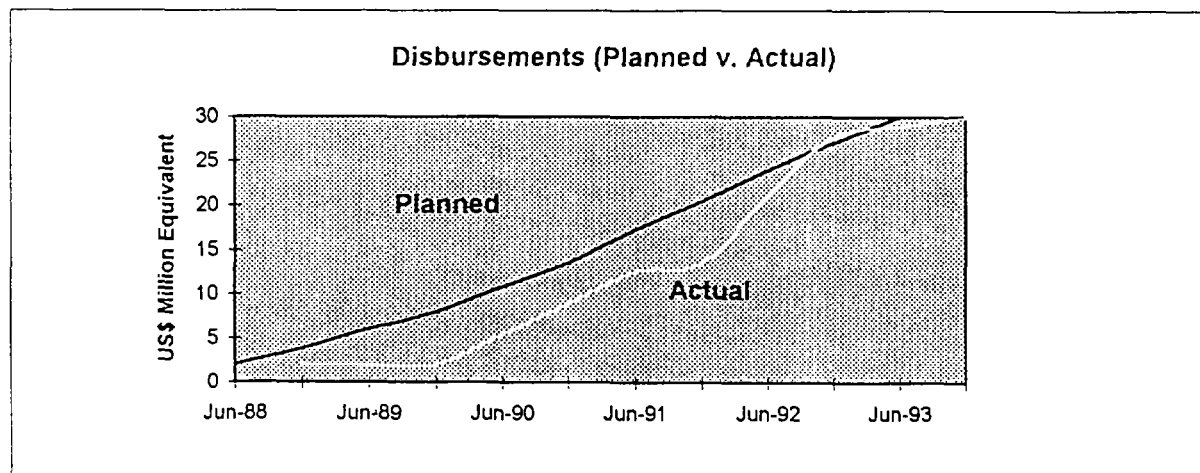
REPUBLIC OF KOREA

TAEGU URBAN TRANSPORT PROJECT (LOAN 2908-KO)

PROJECT COMPLETION REPORT

Table 3A: Cumulative Disbursements (Planned v. Actual)
(US\$ Million Equivalent)

Fiscal Year/Semester	Planned Disbursements	Actual Disbursements
1988		
June, 1988	2.00	0.00
1989		
December, 1988	3.80	2.00
June, 1989	6.00	2.00
1990		
December, 1989	7.90	2.00
June, 1990	10.80	5.42
1991		
December, 1990	13.50	8.90
June, 1991	17.30	12.51
1992		
December, 1991	20.50	13.52
June, 1992	24.00	21.08
1993		
December, 1992	27.10	27.71
June, 1993	30.00	28.87
1994		
December, 1993		30.00



REPUBLIC OF KOREA

TAEGU URBAN TRANSPORT PROJECT (LOAN 2908-KO)

PROJECT COMPLETION REPORT

Table 3B: Final Disbursement Allocation By Category
(US\$ Million Equivalent)

Project Expenditure 종류별 사업비 지출	Est Cost (SAR) 평가비용 (계획)			Foreign as of total %	Actual Cost 실적 비용			Foreign as of total %
	Local 내자	Foreign 외자	Total 계	외자비율 %	Local 내자	Foreign 외자	Total 계	외자비율 %
1. Shinchon Express way 신천대로	45.1	24.3	69.4	35	51	23.8	74.8	32
2. Other Roads and bridges 기타도로 및 교량	4.7	2.8	7.5	38	10.0	6.2	16.2	38
3. Transportation Systems Management 교통운영개선	4.1	5.6	9.7	57	18.1	0	18.1	0
4. Land 토 지	45.6	0	45.6	0	170.0	0	170.0	0
5. Engineering 기술활동	2.2	0.6	2.8	20	2.2	0	2.2	0
6. Tech. Assistance 기술지원	0.4	0.4	0.8	50	0.7	0	0.9	0
7. Contingencies 예 비 비	6.9	3.0	9.9	30				
- Physical 인 건 비	2.8	1.7	4.5	37				
- Price 보 상 비	4.1	1.3	5.4	25				
Total Project Cost 합 계	109	36.7	145.7	25	252	30.0	282	11

REPUBLIC OF KOREA

TAEGU URBAN TRANSPORT PROJECT (LOAN 2908-KO)

PROJECT COMPLETION REPORT

Table 4: Implementation Schedule (Actual)

	1987				1988				1989				1990				1991				1992				1993			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1. SHIN CHON EXPRESS WAY 신천대로																												
a. Chimsan Br - Kyongdae Br					침산교 ~ 경대교				C C C C				C C C C				C C C C				C C C C				C			
b. Kyongdae Br - 2nd Shinchon Br					경대교 ~ 제2신천교								C C C				C C C C				C C C C							
c. 2nd Shinchon Br - Susong Br					제2신천교 ~ 수삼교				C				C C C C				C C											
d. Taebong Br - Chungdong Br					대봉교 ~ 중동교								D B				A C C C				C C C C				C C			
e. Associated Extensions					연계 연장												B A				C C C C				C C C C			
2. OTHER ROADS AND BRIDGES 기타 도로 및 교량																												
a. 2nd Taebong Br - Namguchong					제2대봉교 ~ 남구청																							
b. Chilsong PB - Shinchon Rd					칠성파출소 ~ 신천대로																							
c. Chungdong Br - Bongduk Sch					중동교 ~ 봉덕국교												B A C C				C C C C							
d. 2nd Taebong Br					제2대봉교																							
e. Chung dong Br					중동교				C C C C																			
3. TRAFFIC SYSTEM MANAGEMENT 교통운영개선																												
a. CED Improvement					교차로 구조개선				D BA CC CC				D BA CC CC				D BA CC CC				D BA CC CC				D BA CC CC			
b. Express Way + Other Improvement					고속도로 + 기타시설개선				D BA CC CC				D BA CC CC				D BA CC CC				D BA CC CC				D BA CC CC			
c. Safety Improvement					안전시설개선				D BA CC CC				D BA CC CC				D BA CC CC				D BA CC CC				D BA CC CC			
d. Public Transport Improvement					대중교통 시설개선				D BA CC CC				D BA CC CC				D BA CC CC				D BA CC CC				D BA CC CC			
4. ENGRING & TECH. ASSIST 기술자와 기술지원																												
a. Construction Supervison					공사 감리				B C C C				C C C C				C C C C				C C C C				C C C C			
b. T.S.M Technical Assistance					T.S.M 기술 지원																							
c. T.S.M Training					T.S.M 교육 훈련				D BA				C C C C															
d. T.S.M Design Supervison					T.S.M 설계 및 감리				D BA				C C C C															

REPUBLIC OF KOREA

TAEGU URBAN TRANSPORT PROJECT (LOAN 2908-KO)

PROJECT COMPLETION REPORT

Table 5A: Cost By Component
(Unit: US\$ Million)

Project Component 사업구성		Est Cost (SAR) 평가비용 (계획)			Actual Cost 실적 비용		
		Local 내자	Foreign 외자	Total 계	Local 내자	Foreign 외자	Total 계
1. Shinchon Express way	신천대로	45.1	24.3	69.4	205.07	23.84	228.91
Civil Works	공사				50.94	23.84	74.78
Land	토지				152.37		152.37
Construction Supervision	감리				1.76		1.76
2. Other Roads and bridges	기타도로 및 교량	4.7	2.8	7.5	15.43	6.16	25.59
Civil Works	공사				10.02	6.16	16.18
Land	토지				4.94		4.94
Construction Supervision	감리				0.47		0.47
3. Transportation Systems Management	교통운영개선	4.1	5.6	9.7	18.77		18.77
Civil Works	공사				18.1		18.1
T.S.M Technical Assistance	T.S.M 기술 지원				0.27		0.27
T.S.M Design Supervision	T.S.M 설계 및 감리				0.40		0.40
T.S.M Training	T.S.M 교육 훈련						
4. Contingencies	예비비	6.9	3.0	9.9	—	—	—
Physical Price	인건비 보상비						
Total Project Cost	합계	60.8	35.7	96.5	239.27	30.0	269.27

REPUBLIC OF KOREA

TAEГУ URBAN TRANSPORT PROJECT (LOAN 2908-KO)

PROJECT COMPLETION REPORT

Table 5B: Project Financing
(Million Won)

Project Expenditur 종류별 사업비 지출	Planned 계획					Actual 실적				
	Bank Loan 은행차관	(%)	Taegu City (대구시)	(%)	Total 계	Bank Loan 은행차관	(%)	Taegu City (대구시)	(%)	Total 계
1. Shinchon Express way 신천대로	18,420	33	37,045	67	55,465	17,993	32	37,976	68	55,969
2. Other Roads and bridges 기타도로 및 교량	1,999	33	4,020	67	6,019	4,505	38	7,335	62	11,840
3. Transportation Systems Management 교통운영개선	1,501	19	6,267	81	7,768	—	—	12,669	100	12,669
4. Land 토 지	0	0	36,450	100	36,450	—	—	110,120	100	110,120
5. Engineering and Tech. Asst 기술활동 및 지원	0	0	2,904	100	2,904	—	—	2,032	100	2,032
6. Contingencies 예 비 비	2,080	26	5,877	74	7,957	—	—	—	—	—
Total Project Cost 합 계	24,000	21	92,563	79	116,563	22,498	12	170,132	88	192,630

REPUBLIC OF KOREA

TAEGU URBAN TRANSPORT PROJECT (LOAN 2908-KO)

PROJECT COMPLETION REPORT

Table 5C: Detailed Project Cost (Actual)

1US\$ = 700Won

		Million Won 백만원			Million US \$			Foreign %	% of Total Cost
		Local 내자	Foreign 외자	Total 계	Local 내자	Foreign 외자	Total 계	외자율	합계에 대한 비율
1. SHIN CHON EXPRESS WAY	신천대로	37,976	17,993	55,969	50,941	23,843	74,784	32.15	29.05
a. Chilsan Br - Kyongdae Br	침산교~경대교	10,489	5,421	15,910	13,852	7,159	21,011	34.07	8.26
b. Kyongdae Br - 2nd Shinchon Br	경대교~제2신천교	10,191	5,654	15,845	13,515	7,498	21,013	35.68	8.23
c. 2nd Shinchon Br - Susong Br	제2신천교~수성교	4,115	1,978	6,093	5,841	2,807	8,648	32.46	3.16
d. Taebong Br - Chungdong Br	대봉교~중동교	7,978	4,940	12,918	10,300	6,379	16,679	38.24	6.70
e. Associated Extensions	연계 연장	5,203	-	5,203	7,433	-	7,433	-	2.70
2. OTHER ROADS AND BRIDGES	기타 도로 및 교량	7,335	4,505	11,840	10,015	6,157	16,172	38.05	6.15
a. 2nd Taebong Br - Nanguchong	제2대봉교~남구청	-	-	-	-	-	-	-	-
b. Chilsong PB - Shinchon Rd	칠성파출소~신천대로	-	-	-	-	-	-	-	-
c. Chungdong Br - Bongduk Sch	중동교~봉덕국교	-	-	-	-	-	-	-	-
d. 2nd Taebong Br	제2대봉교	4공구 포함	4 공구	4 공구					
e. Chung dong Br	중동교	932	621	1,553	1,366	0,910	2,276	39.99	0.81
f. Hyomok over Pass	효목고가도로	6,403	3,884	10,287	8,649	5,247	13,896	37.76	5.34
3. TRAFFIC SYSTEM MANAGEMENT	교통운영개선	12,669		12,669	18.1		18.1		6.58
a. CED Improvement	교차로 구조개선	5,593		5,593	7.99		7.99		2.90
b. Express Way + Other Improvement	고속도로 + 기타시설개선								
c. Safety Improvement	안전시설개선	1,039		1,039	1.48		1.48		0.54
d. Public Transport Improvement	대중교통 시설개선	4,129		4,129	5.90		5.90		2.14
e. Traffic Signals	교통신호기	1,278		1,278	1.83		1.83		0.67
f. Other Equipment	기타 장비 (설비)	630		630	0.90		0.90		0.33
4. LAND	토 지	110,120		110,120	170.02		170.02		57.17
a. Shinchon Express way	신천대로	110,120		110,120	157.31		157.31		57.17
b. Other Roads	기타 도로								
c. Traffic System Management	교통운영개선								
5. ENGRING & TECH, ASSIST	기술자와 기술지원	2,032		2,032	2.90		2.90		1.05
a. Construction Supervison	공사 감리	1,564		1,564	2.23		2.23		
b. T.S.M Technical Assistance	T.S.M 기술 지원								
c. T.S.M Training	T.S.M 교육 훈련	277		277	0.40		0.40		
d. T.S.M Design Supervison	T.S.M 설계 및 감리	191		191	0.27		0.27		
TOTAL PROJECT COST	합 계	170,132	22,498	192,630	251,976	30.0	281,976		100 %

REPUBLIC OF KOREA

TAEGU URBAN TRANSPORT PROJECT (LOAN 2908-KO)

PROJECT COMPLETION REPORT

Table 5D: Detailed Land Acquisition and Compensation

(Won Million 백만원)

	Area 면적 (sq.m)	Owner 소유자		Compensation 보 상 비	A. P. T Ticket 아파트 분양권	P. R. A Ticket 직 장 취업권	Renter 새입자		Compensation 보 상 비	A. P. T Ticket 아파트 분양권	P. R. A Ticket 직 장 취업권
		Family 가구	Persons 인수				Family 가구	Persons 인수			
1. SHIN CHON EXPRESS WAY 신천대로	150,237	1,016	3,473	3,285	426		890	3,286	1,635		
a. Chimsan Br - Kyongdae Br 침산교~경대교	50,000	103	506	424	26		421	1,684	697		
b. Kyongdae Br - 2nd Shinchon Br 경대교~제2신천교	16,000	34	131	132	7		114	406	193		
c. Taebong Br - Chungdong Br 대봉교~중동교	37,500	473	1,429	1,564	332		99	297	234		
d. 2nd Shinchon Br - Susong Br 제2신천교~수성교	20,000	244	859	185	23		57	235	45		
e. Associated Extensions 연계 연장	26,737	162	548	980	38		199	664	466		
2. OTHER ROADS AND BRIDGES 기타 도로 및 교량	29,728	26	99	107	11		58	232	160		
a. 2nd Taebong Br - Namguchong 제2대봉교~남구창	9,700										
b. Chilsong PB - Shinchon Rd 칠성파출소~신천대로	6,228	16	64	107	11		58	232	160		
c. Chungdong Br - Bongduk Sch 중동교~봉덕국교	13,800	10	35								
d. 2nd Jaebong Br 제2대봉교											
e. Chungdong Br 중 동 교											
f. Hyomok Over Pass 효목고가도로											
Sub Total 계	179,965	1,042	3,572	3,392	437		948	3,518	1,795		
. Shinchon Express way 신천대로	150,237	1,016	3,473	3,285	426		890	3,286	1,635		
. Other Roads 기타도로	29,728	26	99	107	11		58	232	160		
TOTAL PROJECT COST 합 계	179,965	1,042	3,572	3,392	437		948	3,518	1,795		

REPUBLIC OF KOREA

TAEGU URBAN TRANSPORT PROJECT (LOAN 2908-KO)

PROJECT COMPLETION REPORT

Table 6: Economic Rate of Return

Economic Rate of Return	Base Case		Cost + 25%		Benefit -25%	
	w/o Time	w Time	w/o Time	w Time	w/o Time	w Time
SAR (%)	24.7	37.2	21.5	32.5	20.6	31.3
Actual (%)	12.3	20.8	----	----	----	----

REPUBLIC OF KOREA

TAEGU URBAN TRANSPORT PROJECT (LOAN 2908-KO)

PROJECT COMPLETION REPORT

Table 7: Status of Loan Covenants

LOAN AGREEMENT

Agreement Section No.	Description of Covenant	Status 1	Comments
3.03(b)	Consultants for transportation planning, traffic engineering and safety improvements shall be appointed by December 31, 1988	Compliance	Korea Transport Institute selected/appointed November, 1988
4.01	Borrower shall (a) maintain adequate records of accounts, (b) submit audits, and (c) obtain separate opinion for disbursements through SOE	Compliance	Annual Audit Reports were submitted prior to 1992. A combined Audit Report for 1992 & 1993 has been submitted
4.02	Feasibility study for proposed extension to Sinchon Expressway and associated road schemes	Compliance	Feasibility study for associate scheme of Hyomok Overpass submitted to Bank

REPUBLIC OF KOREA
TAEGU URBAN TRANSPORT PROJECT (LOAN 2908-KO)

PROJECT COMPLETION REPORT

Table 8: Estimated Completion Costs
(Including All Sources of Funds)

Activity	Staffweeks	Dollars (thousand)
Preparation	15.3	40.8
Appraisal	8.2	21.7
Negotiations/Board	7.5	19.8
Supervision	28.2	75.8
PCR	5	9.2
Total	64.2	167.3

IMAGING

Report No: 14711
Type: PCR