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- Annual Aid Talks with Japan
- Preliminary Project Report, Transport Infrastructure Development Project Calcutta

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1. 要請に関する資料

- Project Formulation Mission for Study on Metropolitan Transport in the Calcutta Metropolitan District
- Annual Aid Talks with Japan
- Preliminary Project Report, Transport Infrastructure Development Project Calcutta

SUMANTRA CHOUDHURY, IAS
Joint Secretary
Transport Department
Govt. of West Bengal



যুগ্ম সচিব
পরিবহন বিভাগ
পশ্চিমবঙ্গ সরকার

D.o. No. JS/TM/G-253

Date December 21, '89

Project Formulation Mission for
Study on Metropolitan Transport
in the Calcutta Metropolitan District.

Dear Sir,

Study on Metropolitan Transport in Calcutta-

The above Project Formulation Mission is at present visiting Calcutta to undertake a study on the Composite Proposal for Development of Metropolitan Transport in Calcutta. The above Composite Proposal was earlier sent to Department of Economic Affairs, Ministry of Finance, Government of India in December, 1988 for its inclusion in the Annual Assistance Scheme with Japan and the Govt. of India sent the said proposal to the Government of Japan for undertaking a study. Your present visit to Calcutta is for conducting a study on the basis of the above proposal.

The Composite Proposal originally sent to Govt. of India includes a number of major areas for improvement of the transportation net work in the Calcutta Metropolitan District. One of these at item no. viii/page -6 of the original project was for "Improvement of Infrastructural Facilities". After the above project was sent to Government of India, the Transport Department of the state government of West Bengal felt that the "Improvement of Infrastructural Facilities" should be given highest priority over the other items mentioned in the Composite Proposal. The state

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D.o. No.....

Date.....

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government accordingly prepared a preliminary project report titled "Transport Infrastructure Development Project " in November, 1989.

The State government now presents to the Japanese Mission the preliminary project report titled "Transport Infrastructural Development Project" and considers that this project shall be given highest priority from amongst the items included in the "Composite Proposal for a Study of Metropolitan Transport in Calcutta" for undertaking development study. The state government now request the Japanese Mission to undertake a Feasibility study by JICA on the above project.

Yours faithfully,


(SUMANTRA CHOUDHURY)
JOINT SECRETARY

End: as above
SC/mc-

21/12/89

SUMANTRA CHOUDHURY, IAS
Joint Secretary
Transport Department
Govt. of West Bengal



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পরিবহন বিভাগ
পশ্চিমবঙ্গ সরকার

D.o. No. JS/TM/G-254

Date December 21, '89

Shri P. G. Mankad,
Joint Secretary (INV)
Ministry of Finance,
Department of Economic Affairs,
Government of India,
New Delhi

Dear Sir,

Annual Aid Talks with JAPAN

We had earlier sent you a "Composite proposal for a Study of Metropolitan Transport in Calcutta" in December, 1988 for inclusion in the Annual Aid Talks with Japan. A Project Identification Mission of JICA is visiting Calcutta for undertaking study on the above (above) project.

We had sent you a project titled "Transport Infrastructural Development Project Calcutta" under this office no. TS-847 dated 7/15th November, 1989 for its inclusion for obtaining assistance from Japan, during the year 1990-91. In fact the above project is a part of the earlier proposal submitted to you and is included at item no. viii-page-6 of the said proposal under the head "Improvement of Infrastructural Facilities".

Now that the state government feels that this project titled "Transport Infrastructural Development project Calcutta" should be given highest priority from amongst the items included in the earlier project. The state government of West Bengal has requested the JICA during their visit to Calcutta that they should undertake a Development and

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Joint Secretary
Transport Department
Govt. of West Bengal



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D.o. No.....

Date.....

- 2 -

Feasibility Study of the said project. I would, therefore, request you to kindly move the appropriate authority so that JICA is entrusted for conducting Development and Feasibility Study of the latest project titled "Transport Infrastructural Development Project, Calcutta" and furnish a report of the same to the state government.

Yours faithfully,

(SUMANTRA CHOUDHURY)
JOINT SECRETARY

SC/mc-

21/12/59

Preliminary Project Report

Transport Infrastructure Development Project Calcutta

November, 1989

Transport Department
Government of West Bengal

1. (a) Project Title --

TRANSPORT INFRASTRUCTURE DEVELOPMENT PROJECT, CALCUTTA

(b) Brief description of the Project --

There will be a number of constituent schemes under the above Project in order to improve the infrastructural facilities of transportation network in Calcutta. The constituent parts will be mainly as below :-

- (i) Construction of a few vehicular flyovers at different locations in Calcutta.
- (ii) Construction of a few pedestrian walkovers/underground tunnels at different congested traffic intersections.
- (iii) Construction of a multi-storeyed parking space at Esplanade, Calcutta and
Construction of a underground multi-storeyed parking space at BBD Bagh area.

2. Purpose and the necessity of the Project-

(Please indicate if it is included in the 7th Plan).

None of the Project proposals are included in the 7th or 8th Five Year Plan. According to 1981 census, the Calcutta Metropolitan District has a population of about 10 million out of which the metro core has a population of about 7 million. The transportation network of the Calcutta Metropolitan District is extremely centralised. The number of registered vehicles per km of road space in Calcutta exceeds 740, as compared to 364 in Bombay. The city is strongly centralised and all vehicles pass through the central area and through a few important roads. Density of pedestrian traffic is also one of the highest in the country. The interface of pedestrian traffic with vehicular traffic is most pronounced on the major thoroughfares and intersections. The city has extremely limited road space of about 4% of the total land area. All these taken together is posing a serious challenge to the traffic circulation in the city. In order to mitigate the ever increasing traffic congestion problems in the metro core, the above project has been taken up.

3. Name of the executing Agency-

Transport Department, Government of West Bengal.

4. Total estimated cost of the Project

Rs.120.43 crores.

(Rupees one hundred and ten crores and forty three lakhs only)

5. Type of equipment to be imported -

Necessary equipments/technology may be imported for construction of R.C.C. Overbridges, R.C.C. flyovers, pedestrian walk-overs, built-up girders etc.

6. Annual phasing of local cost and foreign exchange expenditure -

To be formulated suitably at the time of finalisation.

7. Likely sources of supply of equipment to be imported -

Japan

8. Method of procurement -

As will be advised by O.E.C.F.

9. Costruction schedule or completion schedule -

Five years.

10. Economic and social benefits -

The successful implementation of the project will directly benefit a population of 10 million of the Calcutta Metropolitan District.

11. Various stages of the following clearances wherever applicable -

- (a) Planning Commissioner
- (b) PIB
- (c) EFC
- (d) DGTD
- (e) Empowered Committee
- (f) Other clearances, if any, like CEA, Department of Enviornment etc.

These are under process.

12. Copy of Feasibility Report/other reports/documents -

As already stated the project will constitute a number of schemes. A list of such schemes included in the main project is enclosed at Annexure 'A'. The approximate cost involved in each scheme is also shown.

Annexure 'A'

Project Title -

TRANSPORT INFRASTRUCTURE DEVELOPMENT PROJECT, CALCUTTA

Brief Description of the Project –

There will be a number of constituent schemes under the Project, as indicated below. The Schemes have been classified under three major heads :

(A) CONSTRUCTION OF A FEW VEHICULAR FLYOVERS AT DIFFERENT LOCATIONS IN CALCUTTA

As already stated, the traffic circulation network in the city has become extremely complicated. The purpose of constructing a few 'North-South' and 'East-West' flyovers on major thoroughfares are as below :

- (i) Segregation of the North-South / East-West traffic from the local multi-directional traffic,
- (ii) By grade separation of the intersecting traffic, the major factors causing traffic bottlenecks will be removed or substantially reduced.
- (iii) To ensure smooth and quick dispersal of traffic by creation of additional road space.

The preliminary feasibility reports in respect of each of these schemes have been prepared. Copies of such reports have not, however, been included because of the heavy volume. While preparing designs for construction of these flyovers, the following guidelines have been kept in mind.

- (a) No cost of land acquisition or process of land acquisition is involved.
- (b) Minimum disturbance to existing traffic is caused during the construction period.
- (c) Available area is utilised for providing parking space for as many vehicles as possible, adjacent to the flyovers.
- (d) The up and down carriageways of the flyovers should be each of two-lane width. All along the flyover, the up and down carriageways should be kept separated except at certain points so as to prevent inter-mingling of up and down traffic.
- (e) The ruling gradient has been kept at 1 in 25 and suitable valleys and summit curves provided for smooth riding.
- (f) Horizontal curves have been smoothed out to the maximum possible extent, given the very restricted land availability in the area of the flyovers.
- (g) The superstructure spans have been standardised to the extent possible to allow speedy construction. Use of precast girders and other measures have been adopted.
- (h) Piles and concrete piers on top of them will constitute the substructure in general.
- (i) At locations where the flyover touches or overlap with the Metro alignment, it has been proposed to use bored piles clear from the protective diaphragm walls of the metro and the flyover structure will be spanning wide of the Metro box without imparting load in any manner.

- (j) Concrete box cells will be provided in the lower reaches of the flyover so that area restriction is imposed to the minimum extent and pedestrian movement to the maximum extent can be permitted across the stretch.

LIST OF FLYOVERS -

1) A.P.C. Roy Road at Moulali on A.P.C. Roy Road (North-South)	- Rs. 7.00 crores
2) Lenin Sarani at Chowringhee Road crossing on Chowringhee Road and Lenin Sarani (from Park Street crossing northwards)	- Rs. 20.00 crores
3) Gariahat Intersection on Rashbehari Avenue (East West Flyover)	- Rs. 12.00 crores
4) A.P.C. Roy Road at Shyambazar crossing - Circular Road to B.T. Road (North-South flyover)	- Rs. 5.25 crores
5) A.J.C. Bose Road at Chowringhee Road crossing on A.J.C. Bose Road. (North-South flyover)	- Rs. 5.00 crores
6) A.J.C. Bose Road at Ballygunge Circular Road crossing on A.J.C. Bose Road (North-South flyover)	- Rs. 5.00 crores
7) A.P.C. Roy Road at Maniktala crossing on A.P.C. Roy Road (North- South flyover)	- Rs. 9.31 crores
8) Mayo Road - Park Street flyover	- Rs. 6.37 crores
9) Salt Lake - V.I.P. Road flyover	- Rs. 5.50 crores
10) Flyover at Lenin Sarani and Nirmal Chandra Street crossing	- Rs. 5.00 crores

Rs. 80.43 crores

B. CONSTRUCTION OF PEDESTRIAN WALKOVERS/UNDERGROUND TUNNELS

The density of pedestrian traffic in Calcutta is perhaps one of the highest in the country. Interface of pedestrian traffic with vehicular traffic is most pronounced on the major thoroughfares and intersections. This comprehensively aggravate the total traffic flow. As a result, it has been proposed to construct a few pedestrian walkovers/ underground tunnels at the major intersections :

1. Esplanade crossing
2. Moulali (S.N. Banerjee Road, Lenin Sarani and C.I.T. Road) crossing,
3. Park Street and A.J.C. Bose Road,
4. Chowringhee Road and A.J.C. Bose Road crossing,
5. Sinthi More crossing on B.T. Road,
6. Chiria More crossing on B.T. Road,
7. Shyambazar 5 point crossing,
8. Maniktala (Vivekananda Road and A.P.C. Road), crossing,
9. North-East, South and Western side of Sealdah Flyover (infront of Swaraswati Press Prachi Cinema, Sealdah Court and further West of Chabighar Cinema Hall)
10. Dorina crossing
11. Gariahat crossing
12. Dhakuria Bridge south crossing,

- 13. Jadavpur 8-B, Bus stand crossing.
- 14. Chowringhee Road and Park Street crossing. - Rs. 10 crores

C. CONSTRUCTION OF MULTISTORIED PARKING SPACE AT ESPLANADE AREA AND CONSTRUCTION OF UNDERGROUND MULTISTORIED PARKING SPACE AT BBD BAGH AREA. - Rs. 30 crores

GRAND TOTAL - Rs. 120.43 crores

- 120.43 Crores (Rs. 1204.3 Million)

DESIGN AND ESTIMATE OF A TYPICAL PEDESTRIAN WALKOVER AT NAZRUL ISLAM AVENUE NEAR MANIKTOLA CIVIC CENTRE

Breakup of Prices :-

1. Structural Work (Based on TISCO's Offer) :-

(a) Design & detail of civil & structural work	...		Rs. 80,000.00
(b) Checking of Design & Detail	...		Rs. 20,000.00
(c) Average cost of material including bolts & nuts = 65 M.T. @ Rs.11,500/- per M.T.	...		Rs. 7,47,500.00
(d) Fabrication including one coat red lead primer = 65 M.T. @ Rs.4,000/- per M.T.	...		Rs. 2,60,000.00
(e) Transportation & erection = 65 M.T. @ Rs.2,000/- per M.T.	...		Rs. 1,30,000.00
(f) Final painting with 2 coats of aluminium or synthetic enamel of approved brand & colour = 65 M.T. @ Rs.700/- per M.T.	...		Rs. 45,500.00
(g) Guard railing on pavement with TISCO's plastic coated tubes including erection with necessary foundation work for 200 M.Length = @ Rs. 650/- per Mtr.	...		Rs. 1,30,000.00
			Rs. 14,13,000.00
Plus MBL Overhead & Profit @ 20%	...		Rs. 2,82,600.00
			Rs. 16,95,600.00

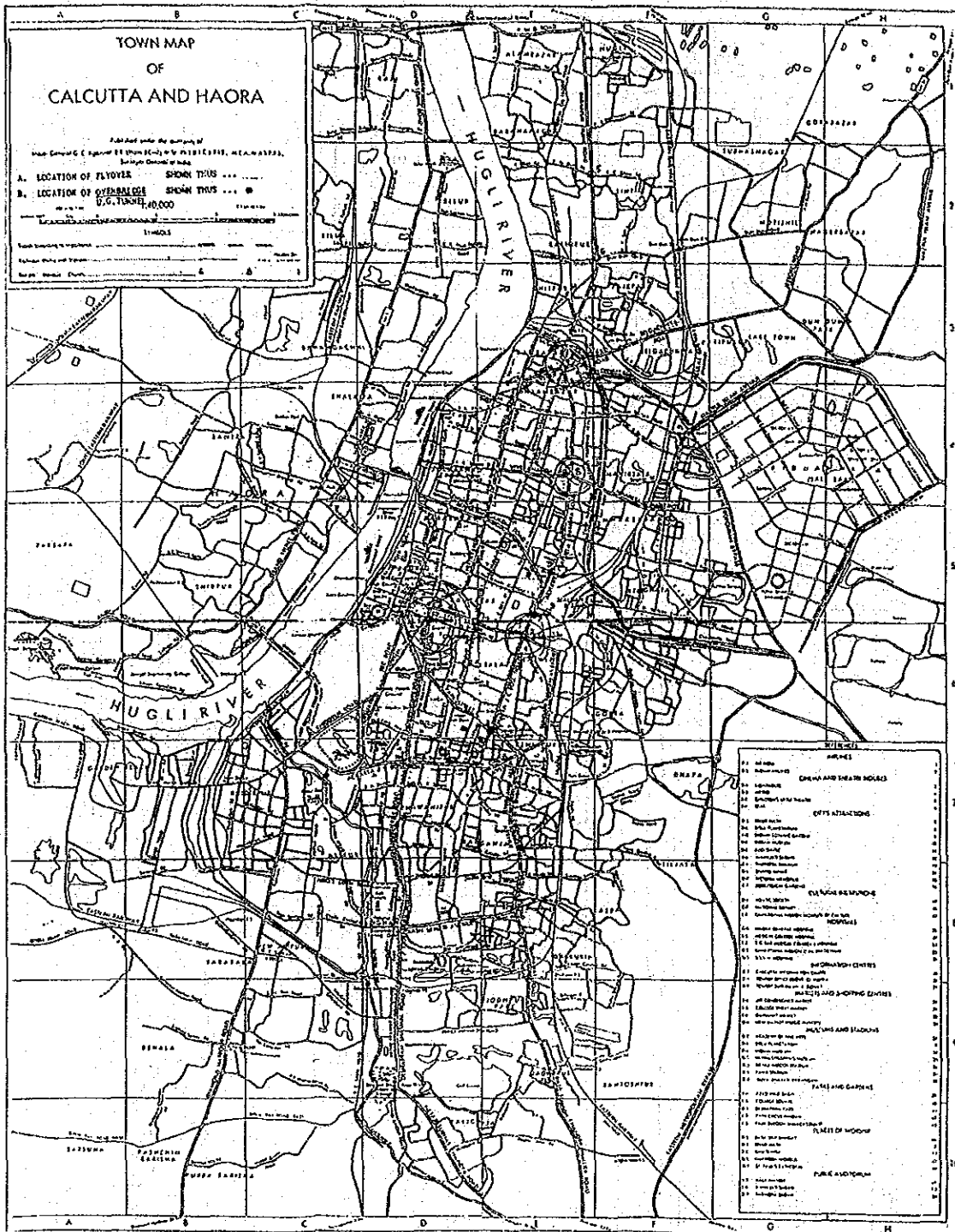
2. CIVIL WORK :-

(a) Earth work in excavation including cutting pucca upto depth of 2.1 M . . . 500 cu.m . . . @ Rs.30/- per cu.m.	...		Rs. 15,000.00
(b) Making good footpath = 200 sq.m. @ Rs.200/- per sq.m.	...		Rs. 40,000.00
(c) Cement concrete (1:2:4) with stonechips in foundation including form work = 75 cu.m. @ Rs.1,900/- per cu.m.	...		Rs. 1,42,500.00
(d) Cement concrete in precast slab = 20 cu.m. @ Rs.5,650/- per cu.m.	...		Rs. 1,13,000.00
(e) Steel Reinforcement = 10 M.T. @ Rs.11,000/- per M.T.	...		Rs. 1,10,000.00
(f) Timer Insulation = 1.0 cu.m. @ Rs.9,000/- per cu.m.	...		Rs. 9,000.00
3. Diversion of Utility Service Line if required (this item will be billed at actual cost involved + 20%). Actual cost will be landed cost of materials at site and labour + incidental charges.	...	L.S.	Rs. 2,00,000.00
4. Site, Office, Site Guarding etc.	...	L.S.	Rs. 25,000.00
5. Electrification.	...	L.S.	Rs. 1,25,000.00
			Rs. 24,75,100.00

COST ESTIMATE OF A TYPICAL VEHICULAR FLYOVER

Main span : 40 M Minimum clearance : 5.4 M
 Vertical slope : 1 in 25 Structural Dept : 1.6 M

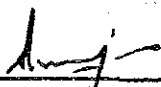
Sl. No.	Name of Item	Cost Estimate in Million Rupees					
		Width of Flyover					
		2-Lane (7 M wide)		3-Lane (10.5 M wide)		4-Lane (14 M wide)	
		Rate Rs.	Cost Rs.	Rate Rs.	Cost Rs.	Rate Rs.	Cost Rs.
1.	Embankment Portion (upto 3 M height) (75M + 75M) = 150 M	35000/M	5.25 m	40000/M	6.00 m	45000/M	6.75 m
2.	Viaduct Portion						
	a) Above 3 M height (100 M + 100 M) = 200 M	60000/M	12 m	80000/M	16 m	100000/M	20.0 m
	b) Main span (Length of curve) = 60 M	60000/M	3.6 m	80000/M	4.8 m	100000/M	6.0 m
3.	Sag curve at toes (30M + 30M) = 60 M	20000/M	1.2 m	25000/M	1.50 m	30000/M	1.8 m
4.	Re-design and Re-building of existing surface roads within Project area	L. S.	3.00 m	L. S.	3.00 m	L. S.	3.00 m
5.	Re-location of affected utilities	L. S.	2.00 m	L. S.	2.00 m	L. S.	2.00 m
	TOTAL :		27.05 m		33.30 m		39.55 m
6.	Drainage provision	@ 10%	2.70 m	@ 10%	3.33 m	@ 10%	3.95 m
7.	Illumination	@ 5%	1.35 m	@ 5%	1.66 m	@ 5%	1.97 m
8.	Miscellaneous		1.50 m		2.00 m		2.00 m
	GRAND TOTAL :		32.60		40.29		47.47
	Say		33.00		41.00		48.00



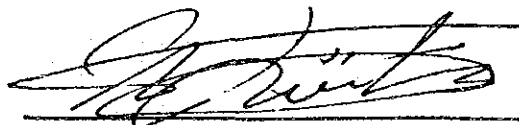
2. SCOPE OF WORK (S/W)

THE SCOPE OF WORK
FOR
THE FEASIBILITY STUDY
ON
THE TRANSPORT INFRASTRUCTURE DEVELOPMENT PROJECT
IN
CALCUTTA

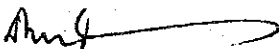
AGREED UPON BETWEEN
THE AUTHORITIES CONCERNED
OF
THE GOVERNMENT OF INDIA
AND
THE JAPAN INTERNATIONAL COOPERATION AGENCY
DELHI, 12TH DECEMBER, 1990



K. DHARMARAJAN
JOINT SECRETARY
Ministry of Urban Development
Government of India



H. KOIKE
LEADER
Preliminary Study Team
Japan International
Cooperation Agency



D. RUDRA
SECRETARY
Transport Department
Government of West Bengal

I. INTRODUCTION

In response to the request of the Government of India, the Government of Japan has decided to conduct the Feasibility Study on Transport Infrastructure Development Project in Calcutta (hereinafter referred to as "the Study"), in accordance with the relevant laws and regulations in force in Japan.

Accordingly, the Japan International Cooperation Agency (hereinafter referred to as "JICA"), the official agency responsible for the implementation of technical cooperation programmes of the Government of Japan, will undertake the Study in close cooperation with the authorities concerned of the Government of India.

The present document sets forth the scope of work with regard to the Study.

II. OBJECTIVE OF THE STUDY

The objective of the Study is to conduct a feasibility study on the following projects for the alleviation of traffic congestion in the core of Calcutta:

- (1) construction of a few vehicular flyovers at different locations
- (2) construction of multi-storeyed parking spaces
- (3) other traffic improvement measures

The target year of the Study shall be set up 1998.

III. SCOPE OF THE STUDY

In order to achieve the objective mentioned above, the Study shall cover the following items:

- 3.1 To collect and review available information and reports relevant to the Study
- 3.2 To conduct field survey for evaluating the present road and traffic conditions
- 3.3 To conduct supplementary surveys
 - (1) socio-economic activity
 - (2) topographical conditions
 - (3) geological conditions
- 3.4 To forecast future traffic demand
- 3.5 To prepare and evaluate alternative plans

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- 3.6 To establish design criteria
- 3.7 To prepare preliminary engineering design
- 3.8 To prepare construction schedule
- 3.9 To estimate the projects cost
- 3.10 To conduct economic analysis
- 3.11 To evaluate the projects
- 3.12 To prepare implementation programme and recommendation

IV. SCHEDULE OF THE STUDY

The Study will be carried out in accordance with the attached tentative schedule.

V. REPORTS

JICA shall prepare and submit the following reports in English to the Government of India.

5.1 Inception Report (30 copies)

This report will is to describe the overall approach and implementation programme of the Study and to be submitted at the commencement of the Study.

5.2 Progress Report (30 copies)

This report will be submitted with 4 months after the commencement of the Study and contain the provisional outcome of the first field survey.

5.3 Interim Report (30 copies)

This report will be submitted within 8 months after the commencement of the Study and will include the outline of the feasibility study.

5.4 Draft Final Report (30 copies)

This report will be submitted within 12 months after the commencement of the Study and will contain all the results of the Study.

The Government of India will provide with its comments on the Draft Final Report within 4 weeks after receipt of the report.

5.5 Final Report (50 copies)

This report will be submitted within 2 months after receipt of the above mentioned comments on the Draft Final Report.

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VI. UNDERTAKING OF THE GOVERNMENT OF INDIA

6.1 To facilitate smooth implementation of the Study, the Government of India shall take necessary measures :

- (1) To secure the safety of the Japanese Study team (hereinafter referred to as " the Team ").
- (2) To permit the members of the Team to enter, leave and sojourn in India for the duration of their assignment therein, and exempt them from alien registration requirements and consular fees.
- (3) To exempt the members of the Team from taxes, duties and any other charges on equipment, machinery and other materials brought into and out of India for the implementation of the Study.
- (4) To exempt the members of the Team from income tax and other charges of any kind imposed on or in connection with any emoluments or allowances paid to the members of the Team for their services in connection with the implementation of the Study.
- (5) To provide necessary facilities to the Team for remittances as well as utilization of the funds introduced into India from Japan in connection with the implementation the Study.
- (6) To secure permission for the Team to take all data and documents (including photographs, maps) related to the Study out of India to Japan.
- (7) To provide medical services as needed and its expenses will be chargeable on the members of the Team.

6.2 The Government of India shall bear claims, if any arises against the members of the Team resulting from, occurring in the course of, or otherwise connected with the discharge of their duties in the implementation of the Study, except when such claims arise from gross negligence or willful misconduct on the part of the members of the Team.

6.3 Transport Department of the Government of West Bengal shall act as the counterpart agency to the Team and also as the coordinating body in relation with other governmental and non-governmental organizations concerned for the smooth implementation of the Study.

6.4 Transport Department of the Government of West Bengal shall, at its own expense, provide the Team with the followings, in cooperation with other related organizations concerned:

- (1) available data and information, including photographs, related to the Study.
- (2) counterpart personnel
- (3) suitable office space with necessary equipments
- (4) credentials or identification cards
- (5) appropriate number of vehicles with drivers
- (6) permission for entry into private properties or restricted areas for the implementation of the Study.

VII. UNDERTAKING OF JICA

For the implementation of the Study, JICA shall take the following measures:

7.1 To dispatch, at its own expense, the Team to India.

7.2 To pursue technology transfer to the Indian counterpart personnel in the course of the Study.

VIII. OTHERS

JICA and Transport Department of West Bengal Government shall consult with each other in respect of any matter that may arise from or in connection with the Study.

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ANNEX

TENTATIVE STUDY SCHEDULE

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Work in India		[]							[]			[]				
Work in Japan	[]			[]					[]				[]			
Submission of Report	▲ IC/R			▲ P/R				▲ IT/R				▲ DF/R			▲ F/R	

[Legend]

- IC/R : Inception Report
- P/R : Progress Report
- IT/R : Interim Report
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- F/R : Final Report

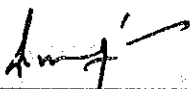
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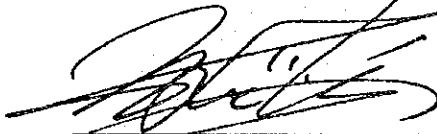
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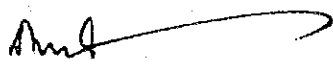
3. MINUTES OF MEETINGS (M/M)

MINUTES OF MEETING
OF
THE FEASIBILITY STUDY
ON
THE TRANSPORT INFRASTRUCTURE DEVELOPMENT PROJECT
IN
CALCUTTA

AGREED UPON BETWEEN
THE AUTHORITIES CONCERNED
OF
THE GOVERNMENT OF INDIA
AND
THE JAPAN INTERNATIONAL COOPERATION AGENCY
DELHI, 12TH DECEMBER, 1990


K. DHARMARAJAN
JOINT SECRETARY
Ministry of Urban Development
Government of India


H. KOIKE
LEADER
Preliminary Study Team
Japan International
Cooperation Agency


D. RUDRA
SECRETARY
Transport Department
Government of West Bengal

The Japanese Preliminary Study Team (hereinafter referred to as "the Team"), organised by the Japan International Cooperation Agency (hereinafter referred to as "JICA") and headed by Dr. Hiroataka KOIKE, visited India from 2 December to 14 December, 1990, to confirm the request made by the Government of India and discuss Scope of Work for the Feasibility Study on the Transport Infrastructure Development Project in Calcutta (hereinafter referred to as "the Study").

The Team had a series of discussions with the representatives from the Ministry of Finance, Ministry of Urban Development and Government of West Bengal, and carried out a field survey in the study area.

Main items which were agreed upon by both sides are as follows:

1. Title of the Study

Both sides confirmed to use "The Transport Infrastructure Development Project in Calcutta" as the title of the study.

2. Scope of the Study

JICA may start the study from July, 1991, at the earliest and shall be conducted in accordance with the scope of work, duly signed on December 12th, 1990.

3. Improvement Plan of Particular Emphasis

In the course of the study, among other things, particular emphasis should be placed on the following improvements:

a. Improvement plans of the road surface traffic flow of the study could be limited in the core of Calcutta, specially on the following two North-South corridors:

- i) Jawaharlal Nehru Road, from Rabindra Sadan to Esplanade;
- ii) from Acharya Jagadish Chandra Bose Road to Acharya Profulla Chandra Road.

b. West Bengal Government provided a tentative list of 10 major intersections where vehicular flyovers are considered necessary, as given below :

- i) A.P.C. Roy Road at Moulali on A.P.C. Roy Road

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- ii) Lenin Sarani at Chowringhee Road Crossing on Chonringhee Road and Lenin Sarani (from Park street crossing northwards)
- iii) Gariahat intersection on Rashbehari Avenue
- iv) A.P.C. Roy Road at Shyambazar crossing - Circular Road to B.T. Road
- v) A.J.C. Bose Road at Chowringhee Road Crossing on A.J.C. Bose Road
- vi) A.J.C. Bose Road at Ballygunge Circular Road crossing on A.J.C. Bose Road-
- vii) A.P.C./Roy Road at Maniktala crossing, on A.P.C. Roy Road
- viii) Mayo Road and Park street
- ix) Nazrul Islam Avenue (Salt lake) and C.I.T. Road (V.I.P. Road)
- x) Lenin Sarani and Nirmal Chandra Street

It was, however, felt by the West Bengal Government and by the Team that the scope of the study need not be restricted to these locations only, and could be made more broad-based. However, the economic feasibility of flyovers at particular locations could be examined only if they were found to be technically feasible.

- c. The West Bengal Government stated that 14 pedestrian walkovers will be constructed in the core of Calcutta under another scheme; this subject need not be included in the study.
- d. Multi-storied/underground parking plazas were strongly proposed by the West Bengal Government at Esplanade and B.B.D. Bag area, the core of Calcutta.
- e. Other traffic improvement measures shall include alternatives to vehicular flyovers in the form of better traffic engineering/management measures, or suitable combinations thereof. In addition, study of the possibility of replacing the existing bituminous road surfaces by concrete overlays, in order to improve the riding quality and reduce the recurring maintenance problems, was strongly requested by West Bengal Government.



- f. A supplementary field survey on existing underground utilities, wherever necessary, was considered essential by the West Bengal Government. The Team took note of this point and agreed to examine the possibility of conducting such a study.
- g. The West Bengal Government requested that during the period of the proposed feasibility study, the concerned JICA officials involved in the Study should not undertake any press briefing in India. The Team took note of this request.

4. Counterpart Training

The Team was requested that Government of West Bengal officials be sent for counterpart training in Japan in order to gain more experience and broader understanding for the Study. The Team took note and expressed its readiness to convey this request to the Government of Japan.

5. Attendance List

The list of persons/officials involved in the above discussions is attached.

A
B.



ATTENDANTS LIST

A. JAPANESE SIDE

A-1 JICA TEAM

Dr. Hirotake KOIKE (Leader)	Professor of Civil Engineering, Utsunomiya University
Mr. Seiichiro AKIMURA (Road Traffic Planning)	Director of Urban Study and Planning, Chugoku Regional Construction Bureau, Ministry of Construction
Mr. Hiroo IKEMOTO (Facilities Planning)	Chief of Road Improvement Section, Midori Public Works Branch office, Road and Highway Bureau, The city of Yokohama
Mr. Yukihiro EJIRI (Coordinator)	First Social Development Study Div., Social Development Study Deptt. JICA
Mr. Toru KAWAKAMI (Traffic Survey)	Traffic Engineering Dept., Nippon Koei Co. Ltd.

A-2 JICA INDIA OFFICE

Mr. Toshio HIDA	Resident Representative
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A-3 EMBASSY OF JAPAN

Mr. Masamichi SAIGO	First Secretary
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B. INDIAN SIDE

B-1 GOVT. OF INDIA

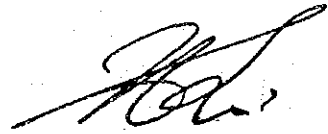
Mr. K. Dharmarajan	Joint Secretary Ministry of Urban Development Govt. of India
Mr. K. S. Sripathi	Director Ministry of Urban Development Govt. of India
Mr. A. Kulshrestha	Director Ministry of Finance Govt. of India



B-2 GOVT. OF WEST BENGAL

Mr.S. Chakraborty	Transport Minister Govt. of West Bengal
Dr. A. Dasgupta	Finance Minister Govt. of West Bengal
Mr. D. Rudra	Secretary Transport Department Govt. of West Bengal
Mr.S.S. Chattopadhyay	Secretary Development & Planning Dept. Govt. of West Bengal
Mr.B.K. Saha	Commissioner of Police Calcutta
Mr.A.K. Majumdar	Chief Executive Officer Calcutta Metropolitan Development Authority
Mr. S. Choudhury	Joint Secretary Transport Department Govt. of West Bengal
Mr.A.K. Bandopadhyaya	Chief Traffic & Transportation Planner Transport Department Govt. of West Bengal
Dr.S.K. Roy	Director General Calcutta Metropolitan Development Authority

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4. Draft Scope of Work

(DRAFT)
SCOPE OF WORK
FOR
THE FEASIBILITY STUDY
ON
THE TRANSPORT INFRASTRUCTURE DEVELOPMENT PROJECT
IN
CALCUTTA

AGREED UPON BETWEEN
THE AUTHORITIES CONCERNED
OF
THE GOVERNMENT OF INDIA
AND
THE JAPAN INTERNATIONAL COOPERATION AGENCY

DELHI, th, DECEMBER, 1990

DEPARTMENT OF ECONOMIC AFFAIRS,
MINISTRY OF FINANCE
GOVERNMENT OF INDIA

Dr. Hirotaka KOIKE
LEADER,
PRELIMINARY STUDY TEAM,
JAPAN INTERNATIONAL
COOPERATION AGENCY

SECRETARY,
MINISTRY OF URBAN DEVELOPMENT
GOVERNMENT OF INDIA

TRANSPORT DEPARTMENT ,
GOVERNMENT OF WEST BENGAL

I. INTRODUCTION

In response to the request of the Government of India, the Government of Japan has decided to conduct the Feasibility Study on Transport Infrastructure Development Project in Calcutta (hereinafter referred to as "the Study"), in accordance with the relevant laws and regulations in force in Japan.

Accordingly, the Japan International Cooperation Agency (hereinafter referred to as "JICA"), the official agency responsible for the implementation of technical cooperation programmes of the Government of Japan, will undertake the Study in close cooperation with the authorities concerned of the Government of India.

The present document sets forth the scope of work with regard to the Study.

II. OBJECTIVE OF THE STUDY

The objective of the Study is to conduct a feasibility study on the following projects for the alleviation of traffic congestion in the core of Calcutta:

- (1) construction of a few vehicular flyovers at different locations
- (2) construction of a few pedestrian walkover/underground tunnels at different congested traffic intersections
- (3) construction of multi-storeyed parking spaces
- (4) other traffic improvement measures

The target year of the Study shall be set up 1998.

III. SCOPE OF THE STUDY

In order to achieve the objective mentioned above, the Study shall cover the following items:

- 3.1 To collect and review available information and reports relevant to the Study
- 3.2 To conduct field survey for evaluating the present road and traffic conditions
- 3.3 To conduct supplementary surveys
 - (1) socio-economic activity
 - (2) topographical conditions
 - (3) geological conditions
- 3.4 To forecast future traffic demand
- 3.5 To prepare and evaluate alternative plans

- 3.6 To establish design criteria
- 3.7 To prepare preliminary engineering design
- 3.8 To prepare construction schedule
- 3.9 To estimate the projects cost
- 3.10 To conduct economic analysis
- 3.11 To evaluate the projects
- 3.12 To prepare implementation programme and recommendation

IV. SCHEDULE OF THE STUDY

The Study will be carried out in accordance with the attached tentative schedule.

V. REPORTS

JICA shall prepare and submit the following reports in English to the Government of India.

5.1 Inception Report (30 copies)

This report will is to describe the overall approach and implementation programme of the Study and to be submitted at the commencement of the Study.

5.2 Progress Report (30 copies)

This report will be submitted with 4 months after the commencement of the Study and contain the provisional outcome of the first field survey.

5.3 Interim Report (30 copies)

This report will be submitted within 8 months after the commencement of the Study and will include the outline of the feasibility study.

5.4 Draft Final Report (30 copies)

This report will be submitted within 12 months after the commencement of the Study and will contain all the results of the Study.

The Government of India will provide with its comments on the Draft Final Report within 4 weeks after receipt of the report.

5.5 Final Report (50 copies)

This report will be submitted within 2 months after receipt of the above mentioned comments on the Draft Final Report.

VI. UNDERTAKING OF THE GOVERNMENT OF INDIA

6.1 To facilitate smooth implementation of the Study, the Government of India shall take necessary measures :

- (1) To secure the safety of the Japanese Study team (hereinafter referred to as " the Team ").
- (2) To permit the members of the Team to enter, leave and sojourn in India for the duration of their assignment therein, and exempt them from alien registration requirements and consular fees.
- (3) To exempt the members of the Team from taxes, duties and any other charges on equipment, machinery and other materials brought into and out of India for the implementation of the Study.
- (4) To exempt the members of the Team from income tax and other charges of any kind imposed on or in connection with any emoluments or allowances paid to the members of the Team for their services in connection with the implementation of the Study.
- (5) To provide necessary facilities to the Team for remittances as well as utilization of the funds introduced into India from Japan in connection with the implementation the Study.
- (6) To secure permission for entry into private properties or restricted areas for the implementation of the Study.
- (7) To secure permission for the Team to take all data and documents (including photographs, maps) related to the Study out of India to Japan.
- (8) To provide medical services as needed and its expenses will be chargeable on the members of the Team.

6.2 The Government of India shall bear claims, if any arises against the members of the Team resulting from, occurring in the course of, or otherwise connected with the discharge of their duties in the implementation of the Study, except when such claims arise from gross negligence or willful misconduct on the part of the members of the Team.

6.3 Transport Department of the Government of West Bengal shall act as the counterpart agency to the Team and also as the coordinating body in relation with other governmental and non-governmental organizations concerned for the smooth implementation of the Study.

6.4 Transport Department of the Government of West Bengal shall, at its own expense, provide the Team with the followings, in cooperation with other related organizations concerned:

- (1) available data and information, including photographs, related to the Study.
- (2) counterpart personnel
- (3) suitable office space with necessary equipments
- (4) credentials or identification cards
- (5) appropriate number of vehicles with drivers

VII. UNDERTAKING OF JICA

For the implementation of the Study, JICA shall take the following measures:

7.1 To dispatch, at its own expense, the Team to India.

7.2 To pursue technology transfer to the Indian counterpart personnel in the course of the Study.

VIII. OTHERS

JICA and Transport Department of West Bengal Government shall consult with each other in respect of any matter that may arise from or in connection with the Study.

ANNEX

TENTATIVE STUDY SCHEDULE

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Work in India		[Bar]							[Bar]			[Bar]				
Work in Japan	[Bar]			[Bar]					[Bar]				[Bar]			
Submission of Report	▲ IC/R			▲ P/R				▲ IT/R				▲ DF/R			▲ F/R	

[Legend]

- IC/R : Inception Report
- P/R : Progress Report
- IT/R : Interim Report
- DF/R : Draft Final Report
- F/R : Final Report

5. インド国カルカッタ都市交通施設整備計画調査
(事前調査S/W) 対処方針案

インド国カルカッタ都市交通施設整備計画調査（事前調査（S/W））

対処方針案

項 目	対 処 方 針	備 考
<p>1. 事前調査の目的及び今後の予定</p> <p>(1)目的</p> <p>(2)今後の予定</p>	<p>次の通り整理し、説明する。</p> <p>①先方政府の要請背景、内容及び意向の確認</p> <p>②本格調査の実施方針及びS/Wの協議</p> <p>③先方受け入れ体制の確認</p> <ul style="list-style-type: none"> ・先方政府の実施すべき事項 ・先方カウンターパート機関 ・調整等を目的とする委員会（Steering Committee）の必要性の有無 ・その他 <p>④本格調査に必要な事項の確認</p> <p>・1991年7月 本格調査開始</p>	<p>←別途詳述</p> <p>←最も早い時期</p>
<p>2. 要請内容及び意向の確認</p> <p>(1)全般</p> <p>(2)協力範囲</p>	<p>当方の本件調査に関する考え方を説明する。合意事項については、先方と事前調査団とがS/W, ミツに署名し、確認する。</p> <p>カルカッタ都市圏の交通混雑を緩和するため、立体交差（10カ所程度）及び歩道橋、横断地下道（17カ所程度）の整備並びに立体駐車場（2地域程度）の整備、その他交通混雑緩和策についてフィージビリティ調査を実施する。</p> <p>調査内容は下記のとおりとする。</p> <p>①既存資料・情報の収集、分析及び現地調査による現状把握、対象地域の経済・社会状況調査</p> <p>②対象施設の概略設計</p> <p>③技術的、経済的、（財務的）F/Sの実施</p>	
<p>3. 本格調査の実施方針及びS/W内容の協議</p> <p>(1)本格調査の目的</p> <p>(2)本格調査の対象地域</p> <p>(3)目標年次</p>	<p>カルカッタ都市圏の中心部における交通混雑を緩和するための下記プロジェクトについてのフィージビリティ調査を実施する。</p> <p>①立体交差の建設</p> <p>②歩道橋、横断地下道の建設</p> <p>③立体駐車場の建設</p> <p>④その他交通混雑緩和策</p> <p>カルカッタ都市圏の中心部とするが、路線名、交差点名、地区を限定することについてインド側と協議する。</p> <p>・1998年（調査終了5年後）とするが、インド側との協議によっては変更することもある。</p> <p>・S/Wに明記する。</p>	<p>・④について幾つかの案を説明</p> <p>・可能ならばM/Mに明記する</p> <p>・経済・社会開発計画等との整合性の確認</p>

項 目	対 処 方 針	備 考
(4)本格調査の内容と項目	1. 関連資料・情報の収集、レビュー 2. 現地踏査による現在の道路状況及び交通状況評価 3. 補足調査 (1)社会経済活動調査 (2)地形条件調査 (3)地質条件調査 4. 将来交通需要予測 5. 代替案策定及び評価 6. 設計基準確立 7. 概略設計 8. 施工計画作成 9. 工事費積算 10. 経済分析 11. 総合評価 12. 実施計画及び提言・勧告	・データの有無の確認 ・調査実施の必要性の有無
(5)調査期間	着手からF/R 提出まで15ヵ月程度	・別紙参照
(6)報告書	①インセプションレポート ・本格調査開始時 ・調査実施方針、スケジュール等を記載 ② プロGRESSレポート ・調査開始後3ヵ月以内 ・第1次現地調査の概要 ③ インテリムレポート ・調査開始後8ヵ月以内 ・F/Sの概要 ④ ドラフトファイナルレポート ・調査開始後12ヵ月以内 ・全ての結果 ⑤ ファイナルレポート ④に対するコメント受領後2ヵ月	・報告書の表記は英文

対処方針案-2

項 目	対 処 方 針	備 考
(7)本格調査に必要な確認事項	<ul style="list-style-type: none"> ①カルカッタ都市圏における交通の現況の把握 ②道路・駐車場施設の現状と問題点の把握 ③環境配慮についてのインド側の意向確認 ④カウンターパート機関の「イ」国における位置付けと権能 ⑤道路関係行政組織 ⑥5か年計画等、国家計画その他、関連計画 ⑦交通調査、土質調査、地形測量等の現地調査の必要性 ⑧上記既存資料の存在・整理状況 ⑨現地調査の内容、規模、金額及びローカルコンサルタントの能力 ⑩本格調査の実施時期（自然条件、現地事情等を勘案して決定） ⑪その他の所要の情報 	<p>主としてQuestionnaire に対応</p> <p>・自然条件調査 ・交通調査</p>
<p>4. 先方受け入れ体制の確認</p> <p>(1)先方の実施すべき事項</p> <p>(2)先方カウンターパート機関</p> <p>(3)請訓事項</p>	<p>S/W案をもとに協議する。</p> <ul style="list-style-type: none"> ①カウンターパート機関の確認 ②関連機関の協力体制の確認 ③調整等を目的とする委員会の設置の有無とその役割の確認 (Steering committee) ④Undertaking の内容に係る事項については、必要に応じて請訓する。 ⑤調査内容については、著しい変更の合った場合は必要に応じて請訓する。 	
5. 議事録等	<ul style="list-style-type: none"> ①C/P研修、セミナーの開催については要請の伝達に留める。(M/M記載は可とする) ②あらかじめ作成したS/W案をもとに説明、協議し、合意の後、双方の代表者が署名する。 ③S/W及び調査の実施に関する協議内容を議事録としてとりまとめ、双方の代表者が署名し確認する。 ④ steering committee の設置をM/Mに明記する。 ⑤事業実施段階における資金調達に関しては、調査団の権限範囲外なので、制度の説明に留める。 	<p>・署名者①日本側：調査団長 ②相手側：局長クラス</p>
6. 団員業務分掌	団員所掌業務分掌案による。	
7. 報告書	目次案に従って、各担当者により作成する。	

6. 西ベンガル政府との協議概要
--Draft S/Wに対するコメント (原文)

西ベンガル政府との協議概要

1. カルカッタ警察 コミッショナーとの協議

まず、本調査の目的が単にフライオーバーや歩道橋建設に関するフィージビリティを調査するのではなく、いかなる交通施設の改善が市内交通流の改善に効果があるかを調査することにあるとの点で合意された。西ベンガル政府側は用意した Draft S/W に対するコメントを提示し、その基本的考え方を明らかにした。この書類は付属資料の Minutes of Meeting に添付された。調査団はこのコメントに対する即答を保留し、現在、すべての交差点での交通処理が交通警察官により実施されているところから、その理由をたずねたり、道路横断歩道者が多いことからそれに対する規制策等を話しあった。

また、本調査で提案されている市内中心部での駐車場の建設は、コミッショナーの発言によるもので、レクリエーションとショッピングで賑わう中心部に、すでに余分の駐車スペースがないことを強く主張された。調査団側は Park and Ride 等の流入規制策等も話題にし、広く対策を考えることを述べ合意された。

2. 交通大臣との協議

交通大臣は日本の高度に開発された技術力に多大な期待をいっていており、話題は技術面に集中した。その主なものは、

- 工事中の交通機能を十分に確保してほしい。
- インド国産の資源を活用する交通施設計画としてほしいこと
- 工事期間が一現場当たり6ヶ月以内に短縮できないものか
- 全体の工事期間は5年以内としてほしい
- アスファルト舗装をコンクリート舗装にし、毎年のメンテナンスを軽減したい

等の要望が具体的に述べられた。

これに対し、調査団は特にフライオーバーの建設だけが解決策でないことをここでも繰り返したところ、大臣も賛同し日本のソフト面での技術に期待するとの発言があった。また、コンクリート舗装の件は新たに提案されたもので、調査団は全市内を対称とすることは受け入れられないと発言し、主要な2本の街路に限る提案をしたところ、特に反論はなかった。

3. CMDA との協議

ここでは Calcutta Metropolitan Development Authority (CMDA) がカルカッタ特有の州政府機関である点を時間をかけて説明がなされた。これによると、C

M D Aはカルカッタ都市圏に関するすべての開発計画とそのため予算配分を担当していることが判明し、これに対して日常の都市施設のメンテナンスと、料金徴収徴税は各々のMunicipal Corporationが担当しているとの事であった。従って、C M D Aの職員(5000名以上)は通信、上下水、ゴミ処理、都市交通等すべての開発・改良事業に関与しており、C M D Aを無視しての調査の実施はあり得ないことが確認された。

Draft S/Wに関しては、フライオーバーが主として提案されている2本の主要街路を対象とした調査方針を述べたところ、その街路が囲む面内の交通問題処理を対象にしてはとの逆提案がなされた。(後日パーティーの席で警察のコミッショナーと話し合わせ、調査団の考えで良いとの確認がされた。)

また、調査団の用意した調査資料に関する「QUESTIONNAIRE」の回答書はC M D Aが作成担当者であることも判明し、従来の世銀、アジア開発銀行等の調査では中央政府が調査資料を提出しており、不慣れであるため時間がかかるとの釈明がなされた。

4. 開発計画省との協議

Secretary との話し合いは、日本の経済協力の一般的な事情に関する話し合いに終始し、特にS/Wに影響する話し合いとしてはJ I C AによるF/Sが早くても1991年の7月以後、14カ月をかけて実施される点を説明したところ、より早期の調査完了が望まれるとの発言も含め、今後インド政府は日本政府の協力をより求めるべきであるとの主張が印象に残った。

5. 交通省、Joint Secretary との協議

Joint Secretary Mr. S. Choudhuryは西ベンガル州政府の本件に関する担当責任者であり、彼は先のすべての協議に同席しており、これを総括するための協議が行われた。S/Wの協議の前に、西ベンガル州が提案した駐車場計画について、その予備調査報告書の作成者であるコンサルタント(Mr. Tathagata Roy)を同席させ、具体的な説明がなされた。ここでその基本計画がEsplanadeとB. B. D. BAGの2ヶ所に地下2層式の駐車場を計画しているとの事であった。その予定台数、その他の既存駐車場、建設方式、地下方式採用理由等が話し合われた。

S/Wに関する協議では、Joint Secretaryは現地調査の項目に地下埋設物調査を追加するよう要望があり、しかもその調査を実施するための地下探査機を持ち込んでほしいとの発言があった。調査団は地下探査機の性能について詳しい事情がわからなかったことから明解な約束をすることが出来なかった。また、J I C A調査団のインド国での作業態度について、

- 常にTransport Departmentの指示のもとに作業を進めること
- 新聞記者のインタビューには応じないこと

等、従来の J I C A 調査団にはみられない要望がなされたので、調査団は特に S / W に記すべき内容ではないと反論した。

交通調査に関して、Transport Department は全面的に協力を惜しまないとの発言もあり、コンサルタントを雇用する必要もないとの発言もあったが、後日さらに確認したところ、調査費を Transport Department に支払う話が出たため、この項を正式文書に記録しないことにした。交通解析用のコンピューターも出来れば持ち込んでほしいとの発言があった。西ベンガル政府としての J I C A 調査団に対応する組織としては

Coordinating Agency : Transport Department

Steering Committee : CMDA, Tramway, Railway Police Commissiconer 等々

を考えているとの説明があった。

尚、Joint Secretary は Tramway 会社の社長を兼務している。

6. 大蔵大臣との協議

西ベンガル州では最後に、大蔵大臣とカルカッタの交通対策について話し合いがなされた。大臣は交通大臣も経験しており、その交通工学に対する見識の高さに敬服すべきものがあつた。今までの協議と重複する項目はさけて、特に注目すべき発言内容を以下に記録しておく。

- カルカッタの交通対策は、その特性を充分生かす手法であるべきで、単なる先進国で採用されているものをそのまま提案することは歓迎できない。(信号機の復活はこの類に入るとのこと)
- カルカッタの昼間人口は2倍以上に膨張する点を充分配慮した対策を提案してほしい。
- Tramway は市の中心部での運営から、郊外のベッドタウンを結ぶ運営に切り換えるべきであろう。(現在は赤字経営となっている)
- 毎年9月30日にドウサラ祭 (Dussehra) 日があり、地方からも大勢の人がカルカッタに集中するが、市内の道路は流れが止まることはない。その理由は、人々がトラックに便乗してカルカッタに来るため、自動車台数が増えないため、ここにカルカッタの交通対策のヒントがあると思う。市内走行車輛の8%のバスが92%の乗用者の運ぶ人数を運んでいる事実注目して対策を考えてほしい。

Modifications suggested in the Preliminary Project Report titled "Transport Infrastructure Development Project, Calcutta" which was earlier submitted before the Japan Government through Ministry of Finance, Department of Economic Affairs, Government of India.

The above mentioned project was earlier submitted before the Japanese Government through Ministry of Finance (DEA), Government of India in November/December, 1989. In fact, a team of officials from JICA had visited Calcutta in December, 1989 in order to make a preliminary survey on the above project. Certain developments have now taken place, since the last visit of the JICA officials to Calcutta, and hence it has become necessary to incorporate a few modifications in the scope of work suggested in the preliminary project report submitted earlier before the Japanese Government as shown below :-

1. It was earlier proposed to construct 10 (ten) flyovers, 14 (fourteen) pedestrian walkovers and 2 (two) multi-storied/underground parking plaza in Calcutta at an estimated cost of Rs.120.43 crores in the above project report. In the meantime, the State Government has already finalised alternative sources of technology and finance for construction of the 14 pedestrian walkovers mentioned in the preliminary project report. So, it will not be necessary to include this element in the feasibility study now to be undertaken by the JICA.

2. At certain important major road intersections, where construction of flyovers had earlier been proposed, it may be possible to improve vehicular traffic flows significantly by undertaking more effective surface level management and engineering measures. This aspect should, it is felt, be included in the scope of work for the proposed feasibility study.
3. The possibility of replacing the existing bituminous road surfaces by concrete overlays, in order to improve the riding quality and reduce the recurring maintenance problems, should also form a part of the scope of work. This should particularly apply to the major traffic corridors and intersections proposed to be covered in the study.

contd. page (2)

4. For individual projects the construction schedule, and estimated time for completion should be specifically mentioned. The overall time limit for completion of the project would continue to be as mentioned in the agreement, namely, five years.

Modifications suggested in the draft "scope of work" agreement to be executed between the officials of JICA and Ministry of Urban Development^(Govt) and the Transport Department of the State Government of West Bengal.

1. The item ^{"pedestrian walkover"} under paragraph II(2) may now be deleted, in view of the modifications suggested in the S/W proposed in the Preliminary Project Report.
2. The item under paragraph II⁽³⁾(4) may be rephrased as "other traffic improvement measures including alternatives to vehicular flyovers in the form of better traffic engineering/management measures, or suitable combinations thereof. In addition, another item, to be phrased as "replacement of existing bituminous road surfaces by concrete overlays on major traffic corridors/major intersections" may be added.
3. Under paragraph III (scope of study), sub-para 3.3, another item, for conducting supplementary survey on existing underground utilities, may be included.
4. Under paragraph VII (undertaking of JICA), a new clause may be added as below :-

"During the period of the proposed feasibility study, the concerned JICA officials shall not undertake any press briefings except in consultation with the State Government".

5. Under paragraph VI (undertaking of the Government of India), a fresh clause at Serial 6.5 may be added as below :-

"The study shall be conducted in direct association, at all stages, of the officials of the Transport and other concerned Departments, and under the direct supervision of the State Government in the Transport Department".

7. QUESTIONNAIRE及び回答

QUESTIONNAIRE
THE FEASIBILITY STUDY
ON
THE TRANSPORT INFRASTRUCTURE DEVELOPMENT PROJECT
IN CALCUTTA

DECEMBER 1990

PRELIMINARY STUDY TEAM
OF
JAPAN INTERNATIONAL COOPERATION AGENCY

QUESTIONNAIRE

Re: The Feasibility Study on the Transport infrastructure
Development Project in Calcutta

This questionnaire was prepared by the Japanese Preliminary Study Team on the occasion to visit Calcutta on 5th December 1990 for the Study on Transport Infrastructure Development Project in Calcutta (the Study) to get basic information and data necessary to the Study. Please answer all the questions in English by filling the blank of questionnaire tables as to the availability of the data, and, if possible, please provide all data before our leaving Calcutta on 12th December 1990. However, it can be recognized that answers need not be too much in detail but should be brief and precise because of preliminary character of this questionnaire.

The Study Team may ask for additional data/ information at the meeting with officials of Transport Department of West Bengal Government not only being limited to the following points :

1. Existing National/State Development Plan
2. Latest Budgetary Report of West Bengal/CMD
3. Latest Socio-economic Indices
4. West Bengal State/CMD Statistics
5. Transportation Infrastructure in CMD
6. Relevant Information on other studies
7. Technical Information for the Project Site

Details of the above questions are listed in the attached tables. Your kind and prompt preparation of the data will be highly appreciated, however, if any data is not available at present, please mark a, b, or c in the space of Yes/No according to the future availability of the data as follows:

- Mark "a" be available by the time of commencing the Feasibility Study (July 1991);
- Mark "b" be available during the Feasibility Study after a certain progress will be made; or
- Mark "c" not be available in near future.

Thank you for your cooperation.

Requested Data	Availability		Title of Data
	Yes/No	Source of Available Data	
<p>1. Existing National/State Development Plan</p> <p>2. Latest Budgetary Report of West Bengal/CMD</p> <ul style="list-style-type: none"> - Economy - Industry - Agriculture - Forestry - Infrastructure <p>3. Latest Socio-economic Indices</p> <ul style="list-style-type: none"> - GNP and GNP per capital - GRDP of CMD - Population (National, and CMD) - Population Growth Rate in past & future (National & CMD) <p>4. West Bengal State/CMD Statistics</p> <ul style="list-style-type: none"> - Administrative zoning and major center - Administrative organization and staff - Budget and actual spending 	<p>a</p> <p>a</p> <p>a</p> <p>a</p>	<p>Finance/Statistical Department (Budget Report)</p> <p>State Planning Board/ Census Reports</p> <p>Transport Department/ CMDA/State Planning Board</p>	

Requested Data	Availability		Title of Data.
	Yes/No	Source of Available Data	
<ul style="list-style-type: none"> - Population & employment by zone, industry sector age group, sex - Student - House hold - Industry output - Trading record <p>5. Transportation Infrastructure in CMD</p> <ul style="list-style-type: none"> - Office/Agency being in charge for urban planning, urban road improvement, traffic management - Laws and Standards to support the urban planning and urban road improvement plan - CMD development plan and transportation development strategy - Indian Road Design Manual by road category including design traffic volume, speed, cross section, curvature, gradient, etc. - Traffic flow management at intersections by signalization - Past traffic survey records/O-D survey records or person-trip survey records 	b	Census	
	c		
	cc	Industry Department	
	a*		
	c		
	a	Transport Department/ CMDA	
	a	CMDA/Transport Department/ Cal Corporation	
	a	Transport Department/ CMDA	
	a	IRC/CMDA	
	b	CMDA/Transport Department	
b	CMDA/Transport Department		

Requested Data	Availability		Title of Data
	Yes/No	Source of Available Data	
<ul style="list-style-type: none"> - Any detailed data as to the flyover, pedestrian walkover/underground tunnel, parking area plan mentioned in the Eighth 5 year plan - Any forecast on car numbers for parking spaces - Present number of parking cars in CMD at road side or in public/private spaces - Any construction involved request the parking spaces upon building construction - Any design manual for parking spaces/parking fare/management box - Present parking problem: <ul style="list-style-type: none"> a) Parking demand b) Parking facilities c) Parking problem - Traffic flow inside, into/from and passing the CMD, or relations with special building & facility - Location of periodic traffic count sections in CMD 	a	Transport Department/CMDA	
	b	CMDA/Transport Department	
	c		
	a	Calcutta Corporation/CMDA	
	c		
	c		
	c		
	c		

Requested Data	Availability		Title of Data
	Yes/No	Source of Available Data	
<p>6. Relevant information</p> <ul style="list-style-type: none"> - Relevant studies including on-going studies to its study <ul style="list-style-type: none"> a) Name of studies, agency concerned b) Output of the studies - On-going and proposed projects in CMD <ul style="list-style-type: none"> a) Name of project including housing & industry development project b) Maps indicating the project site c) Outline of the project 	<p>b</p> <p>b</p> <p>b</p>	<p>CMDA/Housing Department/ Housing Board/ Industrial Department</p>	
<p>7. Technical Information</p> <ul style="list-style-type: none"> - Geodetic data in the area of CMD <ul style="list-style-type: none"> a) Triangulation point b) Bench-mark network c) Point description - Geological data in CMD <ul style="list-style-type: none"> Reports of geological/subsoil investigation conducted in the past or ongoing projects 	<p>b</p> <p>b</p> <p>b</p>	<p>PWD/CMDA PWD/CMDA</p> <p>CMDA/PWD/ Calcutta Port Trust/ CIRLHT</p>	

Requested Data	Availability		Title of Data
	Yes/No	Source of Available Data	
- Meteorological data in the area of CMD	a	Meteorological Department	
a) Monthly, daily rainfall	a	Meteorological Department	
b) Temperature	a	Irrigation Dept./CPI	
- Hydrologic data of rivers	a	CMDA/PWD	
- List of General Contractors suitable for the project	a	CMDA/Transport/PWD	
- List of National Consultants	a	"	
a) Survey works	a	"	
b) Subsoil Investigation			
c) Traffic survey			
- Custody of topographic maps of CMD/aerial photos	a	CMDA/Survey and Land Records Department	

8. インド国及びカルカッタ都市圏の概要

—インド都市交通の概要

—西ベンガル政府組織図

インド国及びカルカッタ都市圏の概要

1. インド国の国情

- a. 国名 (Republic of India) インド共和国
- b. 独立年月日 1947年8月15日
- c. 首都 ニューデリー
- d. 国土面積 3,287,590 km² (日本の8.83倍)
- e. 人口 8億2,700万人 (1989年)
- f. 言語 ヒンズー語 (国語), 英語 (準公用語), ウルドウ語, ベンガリー語, テルグ語, 紙幣は16民族の言語が記されている。
- g. 宗教 ヒンズー教 82.7%, イスラム教 11.2%
キリスト教 2.6%, シーク教 1.9%
- h. 人種 インド・アーリア族 (白人), ドラヴィダ族 (褐色)
モンゴロイド族 (黄色)
- i. 気候 気候は次の3大季節に分けられ、変化が著しい。
寒冷期: 11月~2月 気温 10~26.5℃
暑熱期: 3月~6月 気温 26~40℃
降雨期: 6月下旬~10月 気温 21~37.5℃
- j. 地勢 次の3地域に分けられる。
ヒマラヤ地帯: パミール、ヒンドゥークシ、カラコルムなどの山脈をもつヒマラヤ山系とその南方傾斜面からなっている。
インド・ガンジス平野: 北はヒマラヤ地帯、南は半島部との間に東西 2,414kmあり、インダス川、ガンジス川、ブラフマプトラ川が横たわっている広大な沖積層平野である。カルカッタはこの平野に入る。
南部高原地帯: 北はマハーナディ川、ナルバダ川の流れる平野となり、東は600mの高さをもつ東ガーツ山脈に、西は900~1,200mの西ガーツ山脈になっている。

2. インド国の政情

- a. 政体 共和制のもと25州と7直割領よりなる。
- b. 元首 ザイル・シン大統領
- c. 議会 二院制 上院 250名 任期6年
下院 543名 任期5年
- d. 政党 国民会議派, 左派インド共産党, 人民党, その他

3. インド国の経済

- a. 会計年度 4月~3月

- b. 通貨 1 インド・ルピー (Rs) = 100 パイサ (Paisa)
Rs17.80 Per US\$, 1 Rs = 7.5 円
- c. GNP 251 US\$ (1984年) LDC国
- d. 主要産業 農業・漁業 33.3%, 工業 27.2%,
輸送・通信・貿易 19.1%, その他 20.4%
世界有数の工業化された国で、核兵器所有、宇宙産業、深海油田開
発技術、軍事産業におよんでいる。
- e. 貿易 輸出 140.2億ドル (宝石等)
輸入 194.7億ドル (石油・宝石原料等) (1988年)
貿易対称国はECが中心で、次が日米といった順になっている。
- f. 財政 歳入 660,760 百万Rs
歳出 735,600 百万Rs
バランス - 74,840 百万Rs (1988/89予算)
- g. 外貨準備 538億Rs (1987/88)
- h. 対外債務 410.9億ドル (1986)
- i. 経済成長率 5.3% (1981-85)
- j. 物価上昇率 10.8% (1986/87)

4. インド国のインフラ現況

- a. 鉄道 61,850km アジアで最大の延長、世界第4位の鉄道
システム { 全貨物の60% (21.4億トン/km)
全乗客の40% (2,565 億人/km)
2,000年までに12,500kmの電化をめざしている。
- b. 道路 舗装道路 900,000km, 未舗装道路 100万km
国道 32,000 km, 乗用車 100万台, トラック 80万台
2000年までに60,000kmの国道建設をめざす。
民間の有料道路建設導入に意欲的
- c. 造船・港湾 国営造船所 3ヶ所, 400隻の船をもっている。
6.7百万グロストンの船輸送,
主要港は10カ所 東側: カルカッタ、バラディブ、ウィジャカ、
バトナム、マドラス
西側: カンドラ、ボンベイ、マルマガオ、コシン、
マンガローレ、ツチコーリン
最大の港はボンベイ 25百万トン (86/87)
コンテナ施設はボンベイとマドラスにあり
- d. 航空 Indian Airline, Vayudoot, Air Indiaの3社あり、Air India が
国際線に就航 2.5百万人の乗客 (86/87) を輸送した。

e. 通信 電話利用回線 3.8百万 (87/88)、2000年までに18百万までの需要あり、自動交換システム化等がもたれている。

f. 新聞他 新聞発行が自由のため、1,265種の日刊紙が発行されている。映画館は約5000カ所、1人当たり6.6回映画をみるとのこと。

(以上資料は EIU Country Profileによる)

8. インドの都市交通の概要

1. 都市の人口

インドの都市化のスピードは非常に速く、特にここ30年は際立っている。20世紀末には、都市人口が3億2,600万人(全人口の1/3)になるものと見込まれている(図-1参照)。

1971~1981年の10年間の都市人口は46.4%、年率3.9%の伸び率となっている。その他の主な特徴は次の通り。

①インドの12の大都市(人口100万人以上の都市)には、全都市人口の1/4が住んでいる。

②52都市(人口50万人以上の都市)には、全都市人口の2/5が住んでいる。

③1981年の国勢調査によれば、インドには3301の町(town)または都市圏がある。この内訳は、218市(city、人口10万人以上)、1,013の町(medium town、人口2~10万人)2,070の村(small town)である。

④インドの都市人口の60%以上がこれらの市に住んでいる。今世紀になり、都市化の構造は顕著に変化してきており、クラスI(市:city、人口10万人以上を指す)への集中が進んでいる(図-2参照)。

⑤町(town)の都市人口は全体のおよそ1/4であり、また2,070に及ぶ村(small town)は15%も住んでいない。

⑥西暦2001年までには、百万人を越える人口を抱える都市は36になるものと見込まれ、そのうち5都市は5百万人を越える巨大都市(large metropolitan city)である。

市(city)の今後の成長見通し

人口による都市規模の分類(万人)	西暦2001年時点の市(city)数
1,000 万人以上	3
500 ~ 1,000	2
250 ~ 500	7
100 ~ 250	24
50 ~ 100	53
10 ~ 50	340

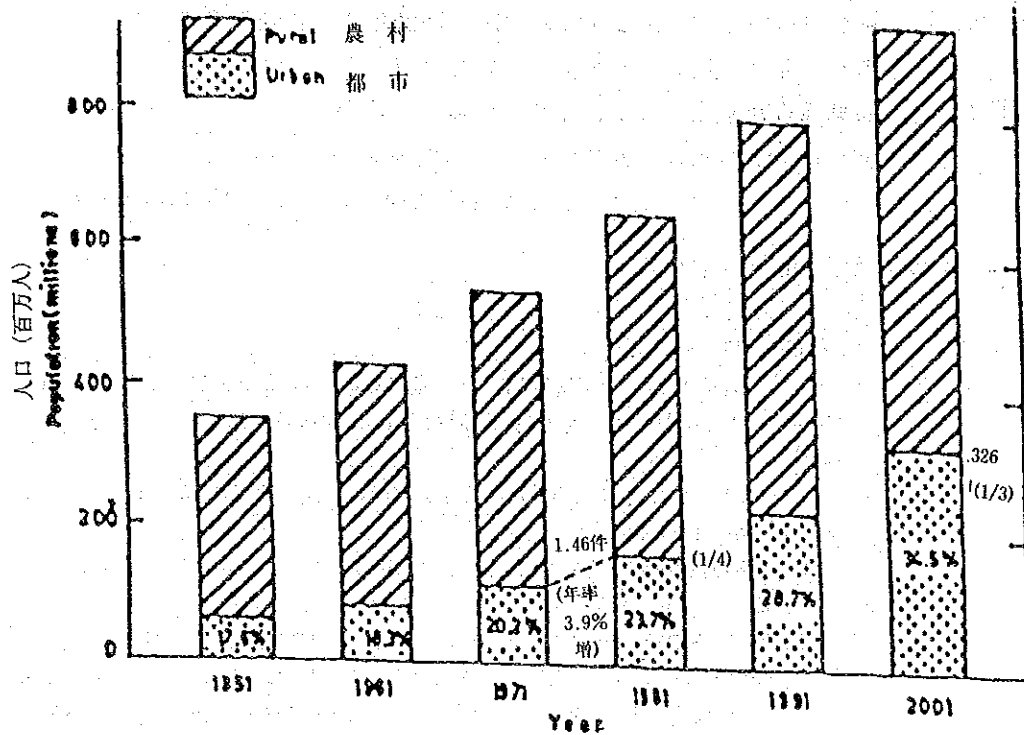
2. 都市交通の状況

都市がどんどん成長する中で、交通需要の増加に交通供給が追いつかないのが現状である。

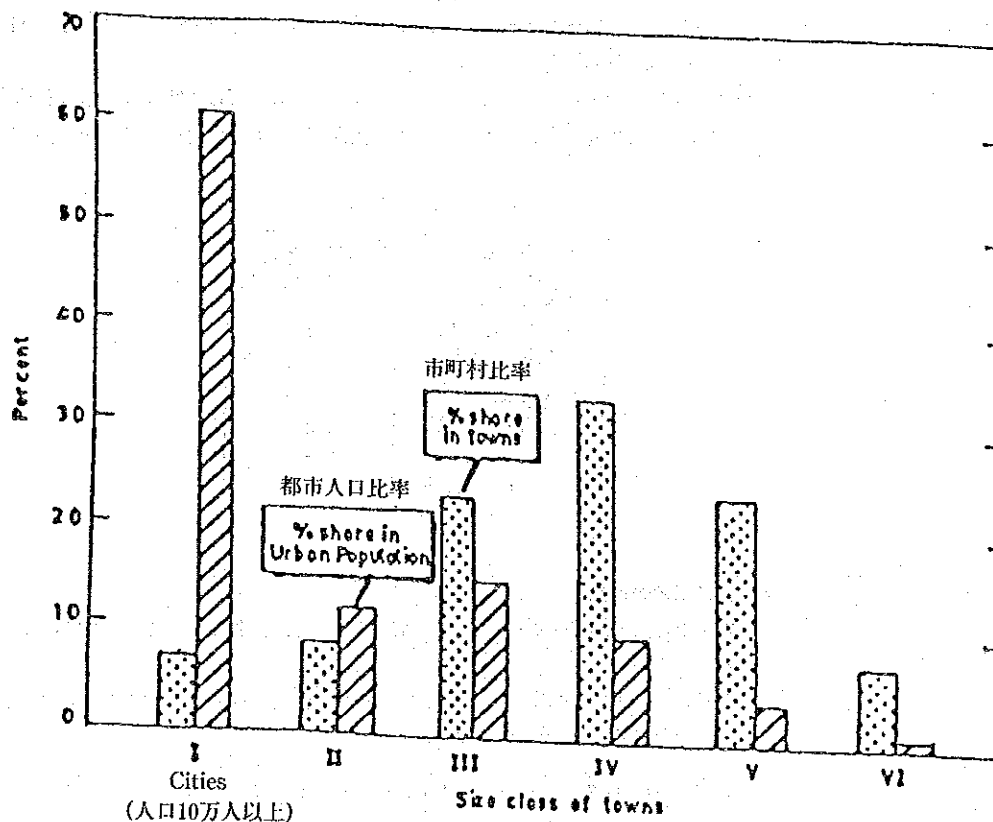
今日、インドでは数多く人が通勤しており、全国で道路交通を利用して通勤している人は、一日に約6,000万人にのぼる。

都市交通の重要性を否定できる人は誰もいない。郊外鉄道サービスが整っているボンベイ、マドラス及びカルカッタのような都市においてさえ、道路交通は非常に重要な問題であるものの、その状況は日増しに悪化している。

以上について説明のため、以下に幾つかの統計資料を示す。



図一 1 インドにおける都市の成長
 FIGURE 1 : Urban Growth in India



図一 2 規模別都市人口分布
 FIGURE 2 : Distribution of Urban Population by Size Class

大都市における自動車の伸びと構成

Table- : Vehicle Growth & Composition in Metropolitan Cities

City	Vehicle strength ('000)		Growth (% per year)	Vehicle Composition (%)					
	1977	1989		2W	3W	Car	Taxi	Bus	Others
Calcutta	147	424	9.2	40	4	<u>40</u>	4	3	9
Bombay	245	588	7.6	38	7	<u>42</u>	6	1	6
Delhi	389	1465	11.7	69	4	20	1	1	5
Madras	69	465	17.2	73	1	22	1	1	2
Bangalore	109	461	12.7	75	3	15	-	1	6
Hyderabad	na	484	na	81	4	9	-	1	5
Ahmedabad	68	289	12.8	72	11	11	-	2	6
Kanpur	32	143	13.7	85	1	8	-	-	6
Pune	106	268	8.0	75	7	9	1	1	7
Nagpur	na	138	na	81	4	8	-	-	7
Lucknow	27	151	15.4	78	2	11	5	1	3
Jaipur	34	211	16.4	70	2	12	1	4	11

Source: Motor Transport Statistics of India, Ministry of Surface Transport.

旅客の交通機関別分担

Table- : Modal Split of Passenger Trips

City	Year study done by (都市圏名)	Study done	Popul ation in base year	personalised transport (%)			Trips Public transport (%)					
				Car	2W	Cy	Rail	Bus	Tx	3W	Other	
				乗用車	二輪自動車	軌道	バス	タクシー	オート力車	その他		
JUMBO CITIES												
			(10万人)									
Calcutta	1984	CMDA	98.1	(not given)			20	72	-	-	8	
Bombay	1986	BMRDA	96.9	8	4	na	33	34	10	11	-	
Delhi	1981	DDA	57.3	6	11	17	na	60	<1	3	3	
Madras	1984	HHDA	47.0	2	5	15	13	63	<1	1	1	
OTHER METROS												
Bangalore	1982	IIM	31.2	3	9	15	-	61	-	4	8	
Hyderabad	1986	CIRT	30.3	na	20	26	-	44	1	3	7	
Ahmedabad	1985	CRRI	29.6	8	24	21	-	34	-	13	-	
Pune	1986	CIRT	20.6	2	28	28	1	31	-	10	-	
Kanpur	1987	CIRT	19.0	2	19	52	2	3	-	2	20	
Patna	1985	CIRT	11.3	e	27	20	-	16	-	*	37	
Jaipur	1983	CIRT	11.2	e	20	44	-	25	-	*	11	
Lucknow	1985	CRRI	11.0	6	12	30	-	29	-	*	19	
Coimbatore	1985	CIRT	10.1	e	10	24	-	62	-	2	2	
OTHER CITIES												
Indore	1985	CRRI	9.7	9	14	16	-	54	-	7	-	
Vadodara	1985	CIRT	8.9	e	19	25	-	43	-	10	3	
Varanasi	1985	CRRI	8.8	4	11	21	-	39	-	5	20	
Cochin	1978	NATPAC	7.7	6	3	14	-	70	<1	1	6	
Ludhiana	1985	CRRI	7.2	9	19	23	-	35	-	7	7	
Calicut	1980	NATPAC	6.1	6	3	11	-	76	<1	3	1	
Trivandrum	1977	NATPAC	5.7	13	5	20	-	60	1	1	-	
Chandigarh	1985	CRRI	5.3	10	15	15	-	54	-	2	4	
Moradabad	1985	CRRI	3.8	8	9	25	-	40	-	*	18	
Cuttack	1985	CRRI	3.8	4	5	8	-	77	-	*	6	
Mangalore	1985	CRRI	3.5	6	7	na	-	77	-	8	2	

e Included in 2 wheelers

* Included in others

デリーとボンベイの交通機関の形態変化

Table : Changing Patterns of Transportation in Delhi & Bombay

City:	Delhi		Bombay	
	1957	1981	1971	1986
Year:				
Total Trips (lakhs)	11.3	39.0	56.3	113.4
% Share of Mode				
Rail	0.4	1.6	41.5	33.4
Bus	22.4	59.7	41.7	33.9
Car	10.1	5.5	6.1	7.6
2 Wheeler	1.0	11.1	1.5	3.6
3 Wheeler	7.8	0.8	-	11.7
Taxi	4.4	0.2	9.2	9.8
Cycle	36.0	17.0	n.a.	n.a.
Others	17.9	4.1	-	-

主要都市の道路交通と混雑度指標

Table : Mobility and Congestion Indicators for Select Cities

City	Road Length (Kms.) per		Road Area as % to Total Area	Vehicles* per Million population	PCU's+ per Km of Road
	1000 Population	100 Sq.Kms.	道路面積率 (%)	人口100万人当り自動車台数	道路1 km 当り PCU
Calcutta	.09	148	6.4	223	256
Bombay	.17	234	n.a.	407	230
Delhi	.28	357	n.a.	1148	331
Madras	.39	292	17.0	250	56
Ahmedabad	.35	974	5.6	561	127
Bangalore	.41	687	17.0	763	150
Kanpur	.58	322	4.1	426	51
Pune	.31	375	11.6	713	175
Jaipur	.24	120	12.1	951	324

*Excluding trucks;

+ PCU = Passenger Car Units (1 Bus = 3 pcu, 2 Wheeler = 0.5 pcu, Car, Taxi, 3 Wheeler = 0.5 pcu)

5. カルカッタ都市圏の社会・経済事情

a. カルカッタ都市圏 西ベンガル州(87,853km²)の中で人口密集の都市圏(1,350km²)の総称、Calcutta Metro politan District (CMD) であり、その構成は下記のとおり。

* 3 - 自治都市 (Municipal Corporation) :

カルカッタ市、ハウラ市、チャンダナガール市

* 31 - 市 (Municipality)

* 2 - 公知地区 (Notified Area)

* 70 - 市街都市区 (Non Municipal Urban Unit)

* 450 - 市街村区 (Rural Mouza)

b. カルカッタ市 カルカッタ市、Calcutta Municipal Corporation (CMC) は CMD の心臓部を形勢する中核であり、西ベンガル州の州都、カルカッタ自治都市の市庁の所在地である。

c. 社会事情 スラム人口48万人、西ベンガル州以外からの流入人口73%、古いカース制度は教育の普及と産業化の中で、特に都市部でその価値を失いつつあり、最下層民は急速にベンガル社会から消滅しつつあるといわれている。これを Economic Weck Section (EWS) と呼び、統計上は45%を占めている。

勤務時間については、中央政府官庁は

平 日 10時～5時30分

土・日曜日 休 日

州政府官庁は、

平 日 10時～5時30分

第2・4土曜 休 日

d. 経済事情 推定1人当たり年収は1,240Rs (1984/85)、カルカッタ市は東部インドの物流センターであり、カルカッタ株式取引所を中心に東部資本市場を形成している。民間資本が5年で10倍の割合で増加しつつある。

一方、従来の工業生産性の低下の最大要因であるストライキ紛争も1970年687件から1985年の34件と減少、非稼働人口も1970年の578万から1983年の20万と経済事情は好転しつつあるといえる。一方、バングラデシュ、ネパール、ブータン等近隣諸国の国際的通商圏の中心をなしており、カルカッタ港がそれをささえているといえる。

6. カルカッタの気候・地理

a. 気候

カルカッタの気候は高温・多湿で、不健康地に指定されている。

3月～5月 暑熱期 時々40℃を超すが、ときどきスコールもある

6月～8月 モンスーン期 連日雨が降り、排水設備不十分のため街は出水し伝染病も発生する。深いなシーズンで8月はとくに衣類にもカビが生える。

9月～11月 雨期後期の雨の少ない時期で日本の8月頃に近く、日差しも強くなってくる。

12月～2月 寒冷期、カルカッタで最高に快適な季節でクーラは必要ない。

b. 地理

カルカッタはガンジス川から分岐した支流フグリ側をベンガル湾の河口から約200km上流の河畔に発達した街である。東経38度20分、北緯22度32分の位置にある。

カルカッタ都市圏はこのフグリ川の両岸に南北に長く発達した都市であり、標高は5.3mにすぎない。付近には丘さえ見ることのできない平坦な土地が広がっている。

地質は約30m～40mの沖積層(N値30以下)の下にN値35～40以上の洪積層と推定される。このことは、西ベンガル政府が作成した駐車場の予備設計報告書のボーリング結果からも粘土、シルト、細砂の互層からなる沖積層が30m～40m堆積していることを示している。

7. 西ベンガル州政府関係組織図

州政府、交通省、CMDAの組織図を以下に示す。

州 政 府 首 相 (Chief Minister)

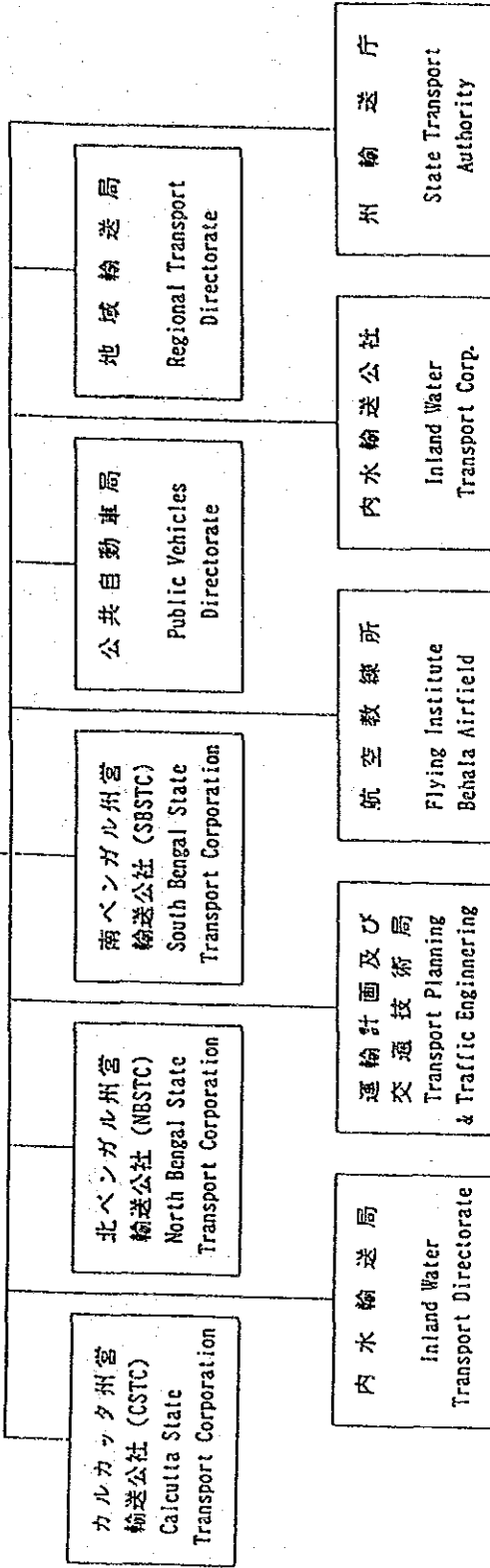
州 政 府 次 官 (Chief Secretary)

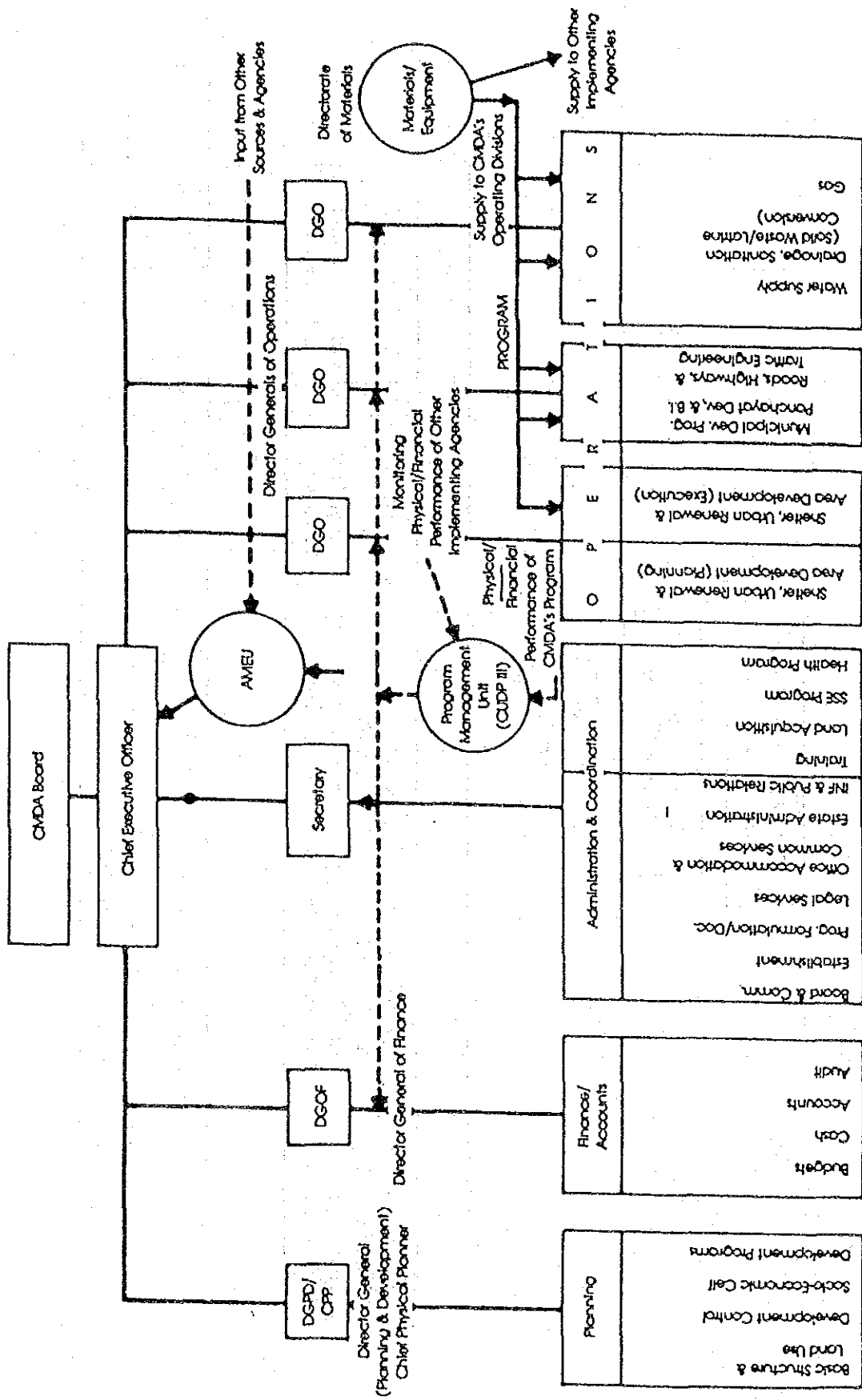
開 発 ・ 計 画 省 (Development & Planning Dept.)	財 務 省 (Finance Dept.)
内 務 省 (Home Dept.)	食 糧 省 (Food & Supplies Dept.)
公 共 事 業 省 (Public Undertaking Dept.)	森 林 省 (Forest Dept.)
地 方 政 府 及 び 都 市 開 発 省 (Local Govt. & Urban Development Dept.)	保 健 ・ 家 族 省 (Health & Family Welfare Dept.)
交 通 省 (Transport Dept.)	文 化 省 (Information & Cultural Affairs Dept.)
漁 業 省 (Fishery Dept.)	土 地 及 び 土 地 改 革 省 (Land & Land Reform Affairs)
農 業 省 (Agriculture Dept.)	パ ン チ ャ ッ ト 及 び C D 省 (Panchayat & CD Dept.)
工 業 復 興 省 (Industry Reconstruction Dept.)	図 書 館 省 (Library Dept.)
商 工 省 (Commerce & Industry Dept.)	電 力 省 (Power & Electricity Dept.)
高 等 教 育 省 (Education Higher Dept.)	初 等 ・ 中 等 教 育 省 (Educational Dept., Primary and Secondary)
勞 働 省 (Labour Dept.)	厚 生 省 (Relief & Welfare Dept.)
中 小 企 業 省 (Cottage & Small Industries Dept.)	指 定 カ ス ト ・ 部 族 福 祉 省 (Scheduled Caste & Tribes Welfare Dept.)
組 合 省 (Co-operation Dept.)	青 年 及 び ス ポ ー ツ 省 (Youth service and Sports Dept.)
法 務 省 (Law Dept.)	灌 漑 省 (Irrigation Dept.)
住 宅 省 (Housing Dept.)	牧 畜 省 (Animal Husbandary and Milk Supply Dept.)

西ベンガル州政府交通省
Transport Dept. of West Bengal Govt.

所 管 大 臣
Minister-in-Charge

次 官
Secretary





9. 収集資料リスト

収 集 資 料 リ ス ト

番号	資料の名称	内 容	頁	版 型	原本 / 写	発行者・機関
1	A HANDBOOK ON TRANSPORT 1989	道路設計データブック	680	幅広A4	原本	DOT, GOWB
2	ECONOMIC REVIEW 89/90 GOWB	経済年報	99	変形B5	原本	State Planning Board GOWB
3	ECONOMIC REVIEW 89/90 GOWB STATISTICAL APPENDIX	経済年報 統計資料	213	変形B5	原本	State Planning Board GOWB
4	EVALUATION OF PERFORMANCE OF ONEWAY TRAFFIC OPERATION June/90	研究報告	18	長大A4	原本	DOT GOWB
5	EVALUATION OF PERFORMANCE OF ONEWAY TRAFFIC OPERATION Aug/90	研究報告	34	長大A4	原本	DOT GOWB
6	SECOND HOUGHLY BRIDGE TRAFFIC FLOW ANALYSIS	研究報告	64	長大A4	原本	Metropolitan Develop Dept.
7	WEST BENGAL ECONOMY	経済専門書	304	長大A5	原本	KALIPADA BASU
8	WEST BENGAL TOWN / COUNTRY ACT 1979	法律解説書	80	長大A5	原本	T.N. SHUKLA
9	LAND ACQUISITION ACT	法律解説書	252	B5	原本	KAMALLOU HOUS
10	MOTOR VEHICLES	自動車産業	1,400	長大B5	原本	EASTER BOOK
11	INDIA 1990	インドの紹介	929	長大B5	原本	GOI
12	MOTOR TRANSPORT STATISTICS INDIA 87-89	研究報告		長大B5	原本	TRANSPORT RESERCH DIVISION

収 集 資 料 リ ス ト

番号	資料の名称	内 容	頁	版 型	原本 / 写	発行者・機関
13	カルカッタ案内	案内書	16	A4	写本	カルカッタ総領事館
14	PRE F/S 4-STOURED UNDER GROUND CAR PARKING PLAZA	研究報告	42	A4	原本	TATHAGATA ROY
15	PRE F/S 2-STOURED UNDER GROUND CAR PARKING AT S. K. D	研究報告	24	A4	原本	TATHAGATA ROY
16	PRE F/S 2-STOURED UNDER GROUND CAR PARKING AT B. B. D. DAG	研究報告	28	A4	原本	TATHAGATA ROY
17	A PROPOSAL FOR UP-GRADATION OF ROAD NETWORK	研究報告	17	長大A4	写本	DOT GOMB
18	A REVIEW OF PLANNING AND DESIGN OF THE PROPOSED ELYOVER AT ESPLANADE	研究報告	16	A4	原本	CMDA
19	URBAN TRANSPORT IN INDIA	実態報告	29	A4	写本	K. DHARMARAJAN
20	INFO INDIA CALCUTTA	ガイドブック	181	長大A5	原本	TOURIST PUBLICATION
21	GUIDE BOOK CALCUTTA	ガイドブック	95	小A5	原本	TT. Maps & Pub
22	DEVELOPMENT NEED OF THE CALCUTTA METROPOLITAN AREA, 1986 - 2011	マスタープラン	40	A4	写本	CMDA
23	インド国プロジェクト形成調査 平成2年	プロファイレレポート	150	A4	原本	JICA

