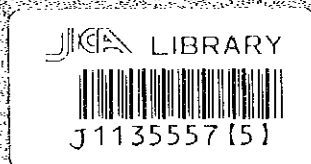


JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)
SECRETARIA DE COMERCIO Y FOMENTO INDUSTRIAL (SECOFI)
THE UNITED MEXICAN STATES

**THE STUDY
ON
MASTER PLAN FOR THE PROMOTION
OF THE SUPPORTING INDUSTRIES
IN
THE UNITED MEXICAN STATES**

FINAL REPORT

FEBRUARY 1997



UNICO INTERNATIONAL CORPORATION

TOKYO, JAPAN

MPI
JR
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Preface

In response to a request the Government of the United Mexican State, the Government of Japan decided to conduct the Study on Master Plan for the Promotion of the Supporting Industries in the United Mexican States, and entrusted the study to Japan International Cooperation Agency (JICA).

JICA sent a study team, led by Mr. Shozo Inakazu of UNICO International Corporation, to the United Mexican States four times from February 1996 to January 1997.

The team held discussions with the officials concerned of the Government of the United Mexican States, and conducted related field surveys. After returning to Japan, the team conducted further studies and compiled the final results in this report.

I hope this report will contribute to the promotion of supporting industries in the United Mexican States and to the enhancement of friendly relations between our two countries.

I wish to express my sincere appreciation to the officials concerned of the Government of the United Mexican States for their close cooperation throughout the study.

February, 1997



Kimio Fujita
President
Japan International Cooperation Agency

February, 1997

Mr. Kimio Fujita
President
Japan International Cooperation Agency
Tokyo, Japan

Dear Mr. Fujita

Letter of Transmittal

We are pleased to submit to you the final report on the Study on Master Plan for Promotion of the Supporting Industries in the United Mexican States. The report contains studies on the present state of automotive, electrical and electronic parts industries in Mexico, analyses of the underlying conditions affecting the promotion of supporting industries, formulation of and recommendations for a master plan and action plans of development projects that compose the master plan.

More specifically, a total of fourteen projects are recommended with regard to nine strategies, namely technology upgrading, subcontracting promotion, entrepreneurship development, manpower development, strengthening of financial support, and laying the foundation of SMEs promotion. Scheduling and expected benefits of each project are also mentioned in the report.

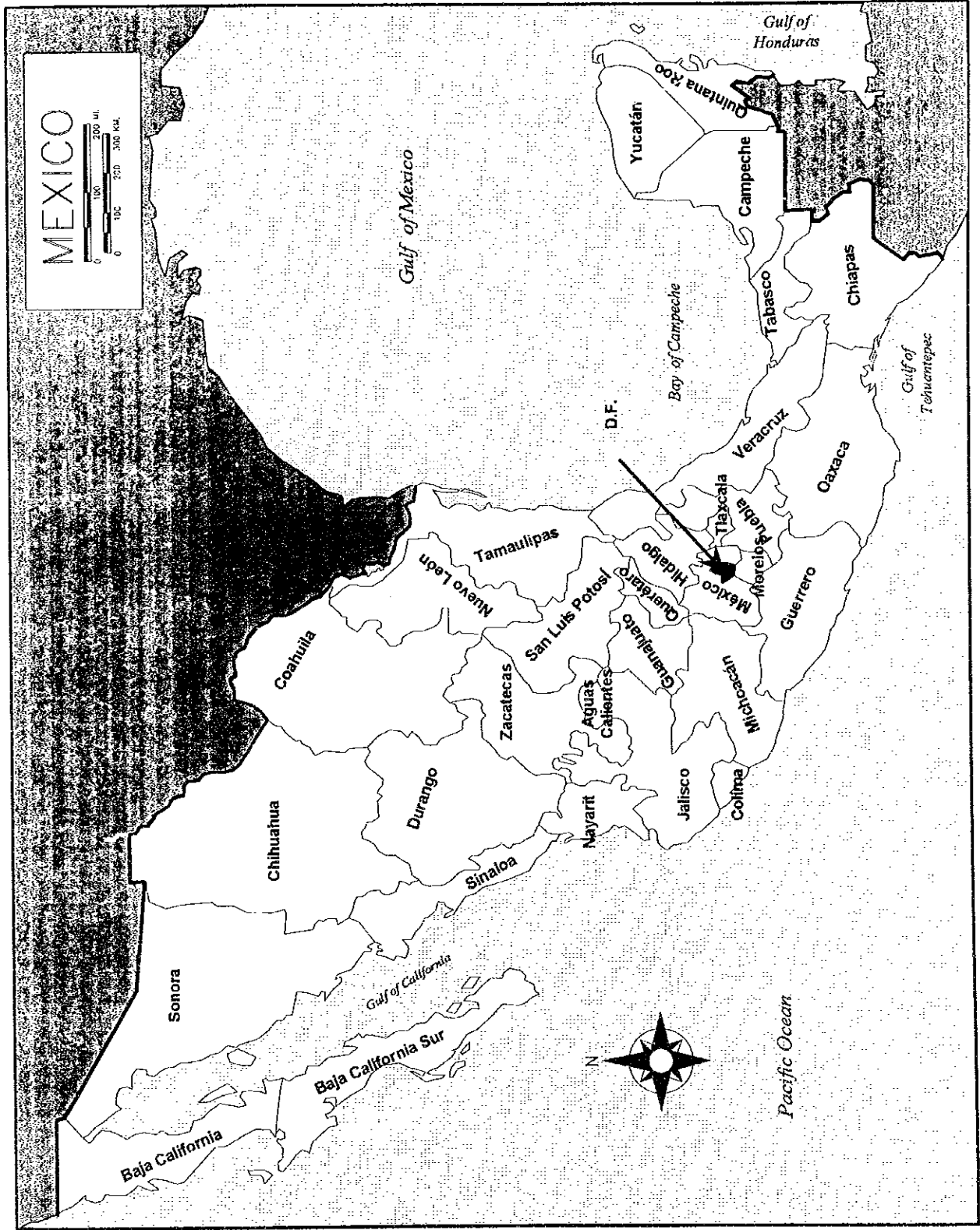
The Mexican Government understands that it is an indispensable and urgent need for further development of Mexican industries to foster the supporting industries which are of great importance to strengthening productive chains or subcontracting structure, and intends to make a development policy and programs. We believe that the master plan recommended in the report serve as a basis for the development programs for fostering the supporting industries and Small- and Medium-scale industries in Mexico.

We wish to take this opportunity to express our sincere gratitude to your Agency, the Ministry of Foreign Affairs including the Japanese Embassy in Mexico and the Ministry of International Trade and Industry of Japan. We also wish to express our deep gratitude to the Secretaría de Comercio y Fomento Industrial (SECOFI) and other authorities concerned of the United Mexican States for the close cooperation and assistance extended to us during our investigations and study.

Very truly yours,



Shozo Inakazu
Team Leader
Study on Master Plan for Promotion
of the Supporting Industries in the United
Mexican States



Map of United Mexican States



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List of Abbreviation

ABS	Acrylonitrile Butadiene Styrene
AMIA	Asociación Mexicana de la Industria Automotriz, A.C.
ANCE	Asociación Nacional de Normalización y Certificación del Sector Eléctrico, A.C.
ANFAD	Asociación Nacional de Fabricantes de Aparatos Domésticos, A.C.
ANPACT	Asociación Nacional de Productores de Autobuses, Camiones y Tractocamiones, A.C.
APRE	Alianza para la Recuperación Económica
ASEAN	Association of South East Asian Nations
ASQC	American Society for Quality Control
AUSEE	Acuerdo de Unidad para Superar la Emergencia Económica
AV	Audio-visual
BANCI	Banco Nacional de Comercio Interior, S.N.C.
BANCOMEXT	Banco Nacional de Comercio Exterior, S.N.C.
BIP	Border Industrialization Program
C.R.	Cold Rolled
CAD	Computer Aided Design
CAE	Computer Aided Engineering
CAINTRA	Cámara de la Industria de Transformación del Estado de Nuevo León
CALMECAC	Calidad Mexicana Certificada
CAM	Computer Aided Manufacturing
CANACERO	Cámara Nacional de la Industria del Hierro y del Acero
CANACINTRA	Cámara Nacional de la Industria de Transformación
CANAME	Cámara Nacional de Manufacturas Eléctricas
CANIECE	Cámara Nacional de la Industria Electrónica y de Comunicaciones Eléctricas
CAREINTRA	Cámara Regional de la Industria de Transformación del Estado de Jalisco
CAST	Centro de Asistencia y Servicios Tecnológicos
CBTis	Centro de Bachillerato Tecnológico Industrial y de Servicios
CCE	Consejo Coordinador Empresarial
CCNN	Comité Consultivo Nacional de Normalización
CE	Concurrent Engineering
CEMYT	Centro de Moldes y Troqueles

CENAM	Centro Nacional de Metrología
CETI	Centro de Enseñanza Técnica Industrial
CETRO	Centro para el Desarrollo de la Competitividad Empresarial
CETis	Centro de Estudios Tecnológicos Industrial y de Servicios
CIATEQ	Centro de Investigación y Asistencia Técnica del Estado de Querétaro
CIDESI	Centro de Ingeniería y Desarrollo Industrial
CIMAV	Centro de Investigación en Materiales Avanzados, S.C.
CIQA	Centro de Investigación en Química Aplicada
CNCCC	Concurso Nacional de Círculos de Control de Calidad
CNCCL	Consejo de Normalización y Certificación de Competencias Laborales
CNN	Comisión Nacional de Normalización
COMIN	Comisión Mixta para la Modernización de la Micro y Pequeña Industria
CONACYT	Consejo Nacional de Ciencia y Tecnología
CONALEP	Colegio Nacional de Educación Profesional Técnica
CONCAMIN	Confederación de Cámaras Industriales de los Estados Unidos Mexicanos
CONCANACO	Confederación de Cámaras Nacionales de Comercio, Servicios y Turismo
COPARMEX	Confederación Patronal de la República Mexicana
CRECE	Centro Regional para la Competitividad Empresarial
CRT	Cathode Ray Tube
CTV	Color Television
DGCFT	Dirección General de Centros de Formación para el Trabajo
DGETI	Dirección General de Educación Tecnológica Industrial
DGN	Dirección General de Normas
E/E	Electric/Electronic
EDM	Electric Discharge Machine
EU	European Union
FIDEIN	Fideicomiso para el Estudio y Fomento de Conjuntos, Parques, Ciudades Industriales y Centros Comerciales
FIDETEC	Fondo de Investigación y Desarrollo para la Modernización Tecnológica
FOGAIN	Fondo de Garantía y Fomento a la Industria Mediana y Pequeña
FOMIN	Fondo Nacional de Fomento Industrial
FONEP	Fondo Nacional de Estudios y Proyectos
FORCCYTEC	Fondo para el Fortalecimiento de las Capacidades Científicas y Tecnológicas

FTA	Free Trade Agreement between U.S.A. and Canada
FUNDAMECA	Fundación Mexicana para la Calidad Total
GATT	General Agreement on Tariffs and Trade
GDP	Gross Domestic Product
H.R.	Hot Rolled
HDPE	High Density Polyethylene
IBRD	International Bank for Reconstruction and Development
IDB	Inter-American Development Bank
IMECCA	Instituto Mexicano de Control de Calidad
IMF	International Monetary Fund
IMNC	Instituto Mexicano de Normalización y Certificación, A.C.
IMP	Instituto Mexicano del Petróleo
IMSS	Instituto Mexicano del Seguro Social
INA	Industria Nacional de Autopartes, A.C.
INEGI	Instituto Nacional de Estadística, Geografía e Informática
IPN	Instituto Politécnico Nacional
ISO	International Organization for Standardization
ITAM	Instituto Tecnológico Autónomo de México
ITESM	Instituto Tecnológico de Estudios Superiores de Monterrey
IVA	Impuesto de Valor Agregado
J/V	Joint Venture
JAPIA	Japan Auto Parts Industries Association
JETRO	Japan External Trade Organization
JUSE	Union of Japanese Scientists and Engineers
LDPE	Low Density Polyethylene
LIBOR	London Inter-Bank Offered Rate
LP	Lean Production
M&E	Machinery and Equipment
MB	Malcom Baldrige
MEs	Micro-sized Enterprises

MIB	Mexican Investment Board
MT	Metric Ton
NAFIN	Nacional Financiera, S.N.C.
NAFTA	North American Free Trade Agreement
NC	Numeric Control
NFiC	National Foreign Investment Committee
NIEs	Newly Industrializing Economies
NMX	Normas Mexicanas
NOM	Normas Oficiales Mexicanas
NORMA	Normas Mexicanas Asociadas
NORMEX	Sociedad Mexicana de Normalización y Certificación, S.C.
OEM	Original Equipment Manufacturing
OJT	On the Job Training
ONN	Organismos Nacionales de Normalización
PAI	Programa de Apoyo Integral a la Industria Mediana y Pequeña
PCB	Printed Circuit Board
PCM	Project Cycle Management
PDM	Project Design Matrix
PE	Polyethylene
PEMEX	Petróleos Mexicanos
PET	Polyethyleneterephthalate
PIEBT	Programa de Incubadoras de Empresas de Base Tecnológica
PITEX	Programa de Importación Temporal Producir de Artículos de Exportación
PNC	Premio Nacional de Calidad
PND	Plan Nacional de Desarrollo
PNN	Premio Nacional de Normalización Integral
PP	Polypropylene
PREAEM	Programa de Enlace Academia - Empresa
PROBECAT	Programa de Becas de Capacitación para Trabajadores
PRODEM	Programa de Desarrollo Empresarial
PROMIN	Programa Unico de Financiamiento a la Modernización Industrial
PROMYP	Programa de Apoyo a la Micro y Pequeña Empresa
PS	Polystyrene

PVC	Polyvinylchloride
QA	Quality Assurance
QC	Quality Control
QCD	Quality, Cost, Delivery
R&D	Research & Development
RCCT	Registro CONACYT de Consultores Tecnológicos
REM	Replacement Equipment Manufacturing
SECOFI	Secretaría de Comercio y Fomento Industrial
SEP	Secretaría de Educación Pública
SHCP	Secretaría de Hacienda y Crédito Público
SINALP	Sistema Nacional de Acreditamiento de Laboratorios de Pruebas
SIs	Supporting Industries
SKD	Semi-Knocked Down
SMD	Surface Mounting Device
SMEs	Small- and Medium-sized Enterprises
SMT	Surface Mounting Technology
SNC	Sistema Nacional de Calibración
SNET	Sistema Nacional de Educación Tecnológica
SQC	Statistical Quality Control
STPS	Secretaría del Trabajo y Previsión Social
TPM	Total Productive Maintenance
TQC	Total Quality Control
TQM	Total Quality Management
TSI	Trade Specification Index
UANL	Universidad Autónoma de Nuevo León
UNAM	Universidad Nacional Autónoma de México
UNIDO	United Nation Industrial Development Organization
UPC	Unidades Promotoras de la Capacitación
UTT	Unidad de Transferencia de Tecnología
VE	Value Engineering

WTC

World Trade Center

Introduction

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Introduction

1 Background of the Study

Manufacturing industries in Mexico are facing intensive competition with imported products as a result of economic liberalization that rapidly progressed in recent years and due to market opening under NAFTA that enacted in January 1994. To effectively compete with imports, they have to strengthen international competitiveness.

Meanwhile, automotive and electrical/electronic industries which are leading export industries in the country have been boosting exports steadfastly in recent years, while attracting waves of foreign investment. It should be noted, however, that export growth occurs in assembled cars and systems without raising local content, i.e., export growth accompanies the increase in import of parts and components for automobiles and electrical and electronic products.

The situation has made the government and industry alike realize the importance of fostering supporting industries which supply parts and components to these major export sectors.

The Government of United Mexican States requested the Government of Japan for formulation of a master plan for promotion of supporting industries. In response, Japan International Cooperation Agency (JICA) sent a preliminary study team to Mexico at the end of August 1995, and on the basis of the result of the preliminary study, the Scope of Work concerning the implementation of the formal study was agreed and signed by the two governments. Pursuant to the provisions of the Scope of Work, JICA sent a study team to the country for field survey and in-depth analysis. This report has compiled the results of the study and related research.

2 Objective of the Study

The study is designed to formulate a master plan for development of supporting industries for the purpose of promoting local production of automotive and electrical/electronic parts and components in Mexico. The master plan consists of, among other things, improvement measures for supporting industries in technical

aspects and recommendations related to basic promotion policy.

3 Scope of the Study

For the purpose of this study, "supporting industries" refer to industries specialized in supply of parts and components required for assembly of automobiles and electrical and electronic equipment.

Industrial subsectors and product segments considered under the study are as follows.

(1) Automotive parts industry

Automobiles mean four-wheel vehicles including buses and trucks.

(2) Electrical/electronic parts industry

Electrical and electronic equipment consists of the following product segments:

1) Consumer electrical equipment

Washing machines, refrigerators, air-conditioners, electric fans, and microwave ovens, not including equipment for power generation and distribution, such as generators, boilers, and turbines.

2) Consumer electronic equipment

Including video equipment, TV receivers, and audio equipment

3) Industrial electronic equipment

Including telephones, facsimiles, copiers, word processors, and computers

4 Methodology and Content of the Study

(1) Phases I and II

The study was conducted in the following two phases. The study team consisted of 12 members including a coordinator.

Phase I:

1) Background study on supporting industries including policy

2) Research and study on current state of automotive parts and electrical and electronic parts industries

- 3) Study on technology level of supporting industries
- 4) Selection of priority parts and components groups

Phase II:

- 1) Research and study on current state of policy and program related to the selected priority parts and components groups
- 2) Infrastructure inventory
- 3) Research and study on materials industries covering priority parts and compartments groups
- 4) Research and study on technology-related official programs covering priority parts and compartments groups
- 5) Study on investment climate in model regions (Querétaro and Chihuahua)
- 6) Formulation of a master plan for promotion of supporting industries

(2) PCM (Project Cycle Management)

The study employed the PCM method under which related parties participated in developing a master plan in the form of workshop.

During the study period, four PCM workshops were conducted at SECOFI, as follows:

February 7, 1996	Participants analysis	(37 participants)
June 13, 1996	Problem analysis I	(31)
July 4, 1996	Problem analysis II	(34)
September 9, 1996	Objective and alternative analysis	(39)

5 Outline of the Field Survey

The field survey was conducted three times, totaling 113 days, and is outlined as follows:

(1) Number of enterprises and organizations visited

	Automobile	Electrical / Electronic	Total
Assembler	4	19	23
Parts/Components supplier	73	58	131
Sub-total			154
Federal Government			13
Local Government			23
Financial Organization			17
Technical Institution			53
Association and Other ¹⁾			63
Sub-total			169
Total			323 ²⁾

Note: 1) includes industrial and trade associations, trading companies, consulting firms and etc.

2) shows total number of visits including duplication.

(2) States visited

The following thirteen states and their major cities were visited twice on average:

- | | |
|--------------------|-------------------|
| 1) Baja California | 2) Chihuahua |
| 3) Coahuila | 4) Nuevo León |
| 5) Tamaulipas | 6) Aguascalientes |
| 7) San Luis Potosí | 8) Jalisco |
| 9) Guanajuato | 10) Querétaro |
| 11) México | 12) D.F. |
| 13) Puebla | |

(3) Parts manufacturers visited for technology assessment

The number of enterprises subject to the assessment of technology levels during the visiting survey of (1), with breakdown by size and subsector, is as follows:

Size (Employees)	Autoparts	Electparts	Total
Small (100 or fewer) ¹⁾	10	22	32
Medium (101 ~250)	16	11	27
Large (251 or more)	20	16	36
No answer	1	1	2
Total	47	50	97
(Average employees)	(368)	(259)	(312)

Note : 1) Micro-scale enterprises with 15 or fewer employees are included in "Small" because of small number of samples.

(4) Responses to questionnaire surveys

- 1) Questionnaire survey by local consultant (316 responses)

The survey was conducted to understand the overall picture related to supporting industries other than Maquiladoras.

- 2) Questionnaire survey by the Team during the visit to enterprises (including assemblers) (109 responses)

The survey was conducted at each enterprise visited by the Team.

- 3) Questionnaire survey for Maquiladoras by facsimile (73 responses)

Questions focused on intention to increase local procurement and reasons for not buying local parts.

6 Study Schedule

The field schedule and submission of reports to the Mexican government (SECOFI) are summarized as follows:

Field survey schedule

- | | |
|----------------------------------|--|
| 1) February 5 - March 25, 1996 | First field survey
(Presentation on Inception Report, discussion, and in-depth survey) |
| 2) June 11 - July 10, 1996 | Second field survey
(Presentation on Interim Report I, discussion, verification, and in-depth survey) |
| 3) September 3 - October 5, 1996 | Third field survey
(Presentation on Interim Report II, discussion, verification, and in-depth survey) |
| 4) January 11 - 19, 1997 | Fourth field survey
(Presentation on Draft Final Report, discussion, and seminars) |

Report submission schedule

February	1996	Inception Report
March	1996	Progress Report I
June	1996	Interim Report I
July	1996	Progress Report II
August	1996	Interim Report II

October 1996	Progress Report III
December 1996	Draft Final Report
February 1997	Final Report

7 Study Team

- 1) Shozo Inakazu Team leader (general)
- 2) Toru Moriguchi Sub-leader (demand study)
- 3) Takeshi Inoue Technical group leader (automotive parts & components / metal working)
- 4)* Takenosuke Kuroda..... Industrial development policy
- 5) Hiromi Yoshikawa Electrical/electronic parts (assembly industry)
- 6) Shiro Suzuki Electrical/electronic parts (plastic processing)
- 7) Hiroshi Imaizumi..... Automotive parts (stamping)
- 8) Akira Hata Factory/production management (assembly of electronic products)
- 9) Tadoru Yamamoto..... Factory/production management (industrial standards)
- 10) Hideyo Shimazu Subcontracting system
- 11) Yoshinari Yamamoto Investment promotion and export promotion measures
- 12)* Hirofumi Yamauchi..... Industrial development policy (replacing Mr.Kuroda)
- 13) Hinako Tanaka Coordinator

* Mr. T. Kuroda was replaced by Mr. H. Yamauchi in August, 1996.

8 Key Contacts

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