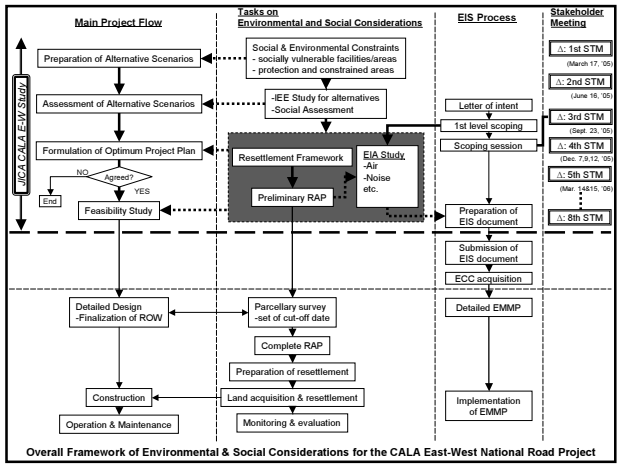
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

THE FEASIBILITY STUDY AND IMPLEMENTATION SUPPORT ON THE CALA EAST-WEST NATIONAL ROAD PROJECT
5th Stakeholders' Meeting in Laguna

Session 1 :
Environment and Social Considerations (ESC) Study

14 March 2006



Overall Framework of Environmental & Social Considerations for the CALA East-West National Road Project

Stakeholder Meetings

No.	Study Phase	Main Subjects	Period
1st	Preparation of Scenarios	· Study Outline · Past, Ongoing & Future Transport Projects · Scope of Stakeholders, · Schedule & Objectives of Future Stakeholder Meetings	March 17, 2005
2nd	Evaluation of Scenarios	· Alternative Development Scenarios · Environmental Framework:Social and Natural Environment · Alternative Scenarios for Regional Transport Network	June 16, 2005
3rd	Preparation of Optimum Project Plan	· Outline of alternatives · Alternative measure in zero option · Scope and evaluation methodologies for Environmental and Social Considerations Study (EIA level) · Obtain opinion on concerned environmental impacts *(This STM is the Official Scoping Session under EIS Process)*	Sept. 23, 2005
4th		· Results of evaluation on alternatives · Progress and interim results of ESC study (EIA level) · Study framework on preparation of optimum project plan	Dec.7 (Cavite) Dec. 8 (Laguna) Dec.12 (Muntenlupa), 2005
5th		· Results of ESC study (EIA level) · Implementation arrangements of the project · Mutual consent on optimum project	Mar.14 (Laguna) Mar.15 (Cavite), 2006
6th	F/S	· Outline of F/S · Follow-up of ESC study (EIA level) · Explanation of resettlement policy	Mid-May, 2006
7th		· Progress of the F/S · Explanation of framework of RAP	Early July, 2006
8th		· Outline of results of F/S · Mutual consent on framework of RAP · Further arrangement and requirement for the implementation	Early Sept., 2006

Results of the Environmental & Social Considerations Study

- Environmental Baseline Study
  - Field measurement surveys: air, noise/vibration, water
  - Secondary data collection
- Social Survey
  - Focus group discussion (Barangay consultation)
  - Perception survey
    - 700 sampled households from project-affected barangays
  - Household inventory survey for resettlement
    (100% survey for potential households to be resettled for ROW acquisition)
    - Approx. 800 households
- Impact Assessment

Results of Baseline Surveys

ENVIRONMENT AND SOCIAL CONSIDERATION STUDY
Feasibility Study and Implementation Support for the Cavite-Laguna (CALA) East-West National Road Project

Introduction

Presidential Decree No. 1586 (PD 1586), otherwise known as the "Philippine Environmental Policy", is considered the first issuance on Environmental Impact Statement (EIS) system in the Philippines, effective in 1977. PD 1586 requires "all agencies an instrumentalities of the national government, including government-owned and controlled corporations, as well as private corporations, firms and entities to prepare an environmental impact statement for every action, project or undertaking which significantly affects the environment."

Major roads are considered as Environmentally Critical Projects and hence require the preparation of an EIS and secure an Environmental Compliance Certificate (ECC).

ENVIRONMENTAL BASELINE STUDY

Objective

The main objective of the Environmental Baseline Study is to collect environmental baseline information in order to characterize the existing environmental condition of the project area and identify and assess potential impacts on its social and natural environment.

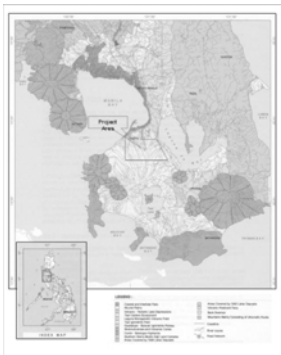
Main Task of the Environmental Baseline Study

1) **Collection and review of existing secondary data**
2) **Field Surveys**
   a) **Air quality sampling**
   b) **Noise and vibration level measurement**
   c) **Water quality sampling**
   d) **Reconnaissance survey on natural conditions**

THE STUDY AREA
PHYSICAL ENVIRONMENT
I . GEOLOGY

Regional Topography and Geomorphology

The project area lies on the northern portion of the Southwest Luzon Uplands. The regional landscape is characterized by gently sloping to rugged mountainous terrain abutting to a wide central plain area marked by freshwater lakes (Laguna Lake and Taal Lake). The project area is situated on slightly elevated sloping region on the northern portion of the Taal Ignibrite Field, a sequence of quaternary pyroclastic deposits and east of the coastal areas of Cavite.



Regional Geology

The Laguna volcanic plain was created by the volcanic activities that formed the Taal Volcano and neighboring volcanic vents. The volcanoclastic rocks underlying the project area appear to have been expelled mostly from Taal Volcano. The active volcanism provided for the large volume and thick accumulation of volcanic ejectamenta or pyroclasts at sites of deposition at a distance from the volcano source.

The volcanic materials were later eroded and transported by surface water to lower areas where they underwent some sorting that resulted in occasional beds of well-sorted tuffaceous sands and gravel.

Regional Geology

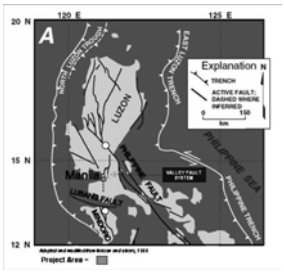
The Laguna volcanic plain is bounded to the west by a fault, known as the West Valley Fault (WVF), that trends north-south from Muntalan to Tagaytay Ridge and traverses west of Carmona. The trace of the fault from Muntinlupa area and about 5kms west of the Project Site is generally not very clear. The abrupt ascent of the land (Carmona area) towards Tagaytay suggests the presence of the fault. The eastern block of WVF moved downward relative to the western block.

Regional Tectonic Setting

Luzon Island is situated at the western margin of the Circum-Pacific region, centered roughly at 15ºN latitude and 121ºE longitude. The region is characterized y an active convergence between the Eurasian and Pacific plates.

Two active subduction systems of opposing polarity border Luzon: the eastward-dipping Manila trench on the west, and the incipient, northward-propagating, westward-dipping east Luzon trench, on the east.

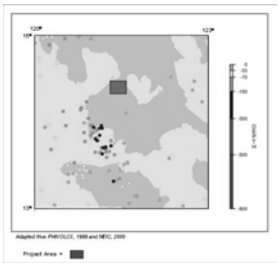
At the Laguna and Cavite sector, volcanic rocks show marked difference in chemical composition from typical arc-related calc-alkaline volcanics. A NE-SW trending "rift" structure – referred to as the Macolod Corridor was proposed to account for this geochemical variation.



Regional Seismicity

Earthquake events tend to cluster in the offshore region along the Verde Island Passage between the southeast coast of Batangas and Mindoro Island. Moderate to deep (> 150 kms) foci seismic events with a predominant thrust focal mechanism solution indicate active convergence along the southern extension of the Manila Trench system. In contrast, shallow seismic events (<70kms) appear to have originated from th movements of regional faults (e.g. Mindoro Fault, Lubang Fault) and their minor splays.

A single event located within Taal Lake is of volcanic origin associated with the 1965 eruption of Taal Volcano.

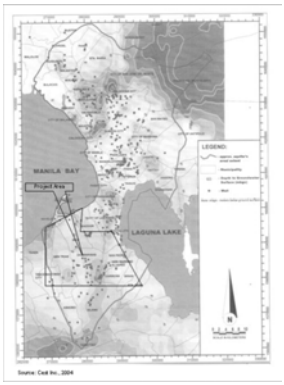


THE STUDY AREA
PHYSICAL ENVIRONMENT

II . HYDROGEOLOGY

Hydrogeologic Units

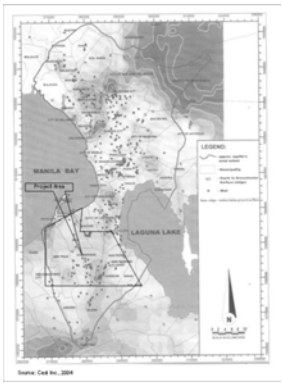
- **Quaternary Volcanic Sediments**
  The Quaternary volcanic sediments form the main host of the underlying aquifers of the project area. It consists of layers of tuffaceous pebbly sandstone or tuff, which are all capable of storing and transmitting large quantities of groundwater. Known production yields are almost about 20 liters per second (lps) but as high as 60 lps in some areas. The aquifers are under confined to semi-confined conditions.



II . HYDROGEOLOGY

Hydrogeologic Units

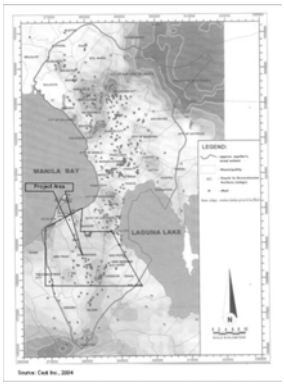
- **Quaternary Alluvium**
  The Quaternary alluvium are recent unconsolidated alluvial deposits that consists of clay, silt, sand and gravel along coastal areas, river beds and floodplains. Alluvial deposit aquifers in coastal areas are restricted by sea water intrusion while inland aquifers are restricted by low storage due to limited aquifer area and/or thickness. Well yields are mostly about 2 lps but as high as 20 lps in some areas. Shallow aquifers are under unconfined conditions.



II . HYDROGEOLOGY

Groundwater Levels

Groundwater depths at the project area ranges from 60 meters below ground surface (mbgs.) to 100 mbgs.



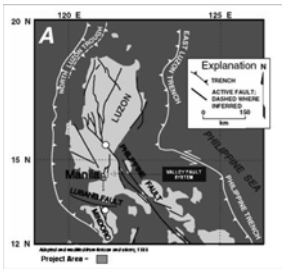
THE STUDY AREA
PHYSICAL ENVIRONMENT

III . NATURAL HAZARDS

Seismic Hazards

Of the known major tectonic structures in the region, the nearest earthquake generator to the project site is the extension of the West Valley Fault (WVF).

A paleoseismic study (Nelson and others, 2000) suggests that the northern part of this fault has a recurrence interval of 200-400 years for magnitude 6-7 earthquakes on the fault for an annual probability rate of 0.5% to 0.25%.



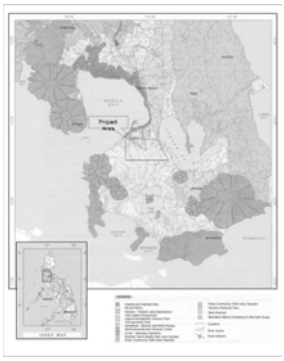
III . NATURAL HAZARDS

Volcanic Hazards

The nearest active volcano within the vicinity of the Project area is Taal Volcano. Eruption-related volcanic hazards for Taal volcano would include airfall tephra, base surge, fissuring and ground subsidence, seiches/tsunami and flooding.

Considering the more than 25-km distance of the Project Site to Taal Volcano, it is unlikely that the area will be directly and adversely affected by eruption-related volcanic hazards from the volcano.

At most the area may be affected by minial ash fall if wind speed and direction were favorably directed towards its location.



III . NATURAL HAZARDS

Foundation Hazards

Paleosol horizons are known to occur in the pyroclastics at the project area. With contrasting textural types of the under lying foundation, the area is susceptible to differential settlement or long-term settlement.

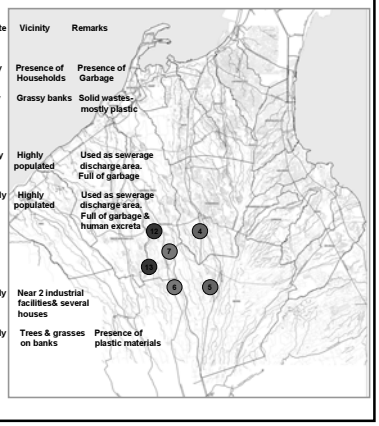
The damage attributable to settlement can range from complete failure of the structure to slight disfigurement.

Settlement can be reduced:

•if the site is preloaded or surcharged prior to construction, or
•if the soil is subjected to dynamic compaction or vibrocompaction.

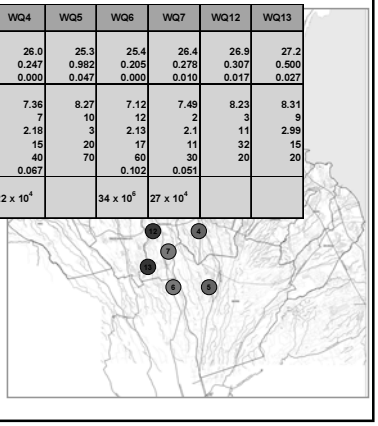
IV . WATER QUALITY

	Water Depth	Color	Substrate	Vicinity	Remarks
Imus River Basin					
WQ4	Very Shallow	Murky Brown	Muddy	Presence of Households	Presence of Garbage
WQ5	Shallow	Clear Green	Sandy	Grassy banks	Solid wastes, mostly plastic
Ilang-ilangRiver Basin					
WQ6	Shallow	Dark Brown	Muddy	Highly populated	Used as sewerage discharge area. Full of garbage
WQ7	Shallow	Brown Brown	Muddy	Highly populated	Used as sewerage discharge area. Full of garbage & human excreta
Rio Grande River Basin					
WQ12	Shallow	Clear	Sandy	Near 2 industrial facilities& several houses	
WQ13	Shallow	Clear	Sandy	Trees & grasses on banks	Presence of plastic materials



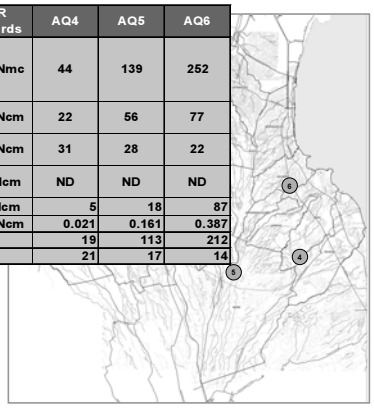
III . WATER QUALITY

PARAMETERS	DENR Standards	WQ4	WQ5	WQ6	WQ7	WQ12	WQ13
Physical Characteristics							
Temperature	-	26.0	25.3	25.4	26.4	26.9	27.2
Conductivity (ms/cm)	-	0.247	0.982	0.205	0.278	0.307	0.500
Salinity (ppm)	-	0.000	0.047	0.000	0.010	0.017	0.027
Chemical Characteristics							
pH	6.5 - 9.0	7.36	8.27	7.12	7.49	8.23	8.31
BOD	7(10)mg/L	7	10	12	2	3	9
DO	5.0 mg/L	2.18	3	2.13	2.1	11	2.99
Turbidity	NTU	15	20	17	11	32	15
TSS	60 mg/L inc.	40	70	60	30	20	20
Lead	0.05 gm/L	0.067		0.102	0.051		
Biological Characteristics							
Total coliform	5,000 MPN/100mL	22×10^4		34×10^6	27×10^4		



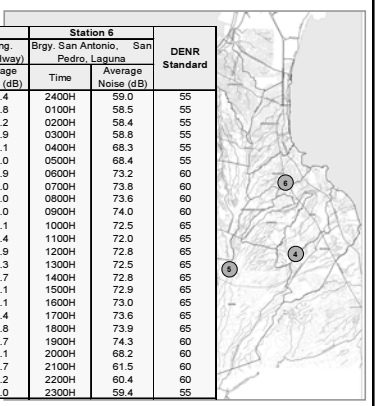
V . AIR QUALITY

PARAMETERS	DENR Standards	AQ4	AQ5	AQ6
Total Suspended Prticulates (TSP)	230 ug/Nmc	44	139	252
Sulfur Dioxide (SO_2)	180 ug/Ncm	22	56	77
Nitrogen Dioxide (NO_2)	150 ug/Ncm	31	28	22
Carbon Oxide (CO)	35 ug/Ncm	ND	ND	ND
Ozone (O_3)	140 ug/Ncm	5	18	87
Lead (Pb)	1.50 ug/Ncm	0.021	0.161	0.387
SPM	-	19	113	212
NO	-	21	17	14



VI . NOISE LEVEL

Station 4		Station 5		Station 6		DENR Standard
R.C. Sta. Rosa Centro, Sta. Rosa, Laguna		Brgy. Biga I, Silang. Cavite (Aguinaldo Hway)		Brgy. San Antonio, San Pedro, Laguna		
Time	Average Noise (dB)	Time	Average Noise (dB)	Time	Average Noise (dB)	
2400H	50.6	2400H	52.4	2400H	59.0	55
0100H	50.8	0100H	50.8	0100H	58.5	55
0200H	50.2	0200H	50.2	0200H	58.4	55
0300H	50.4	0300H	50.9	0300H	58.8	55
0400H	51.5	0400H	54.1	0400H	68.3	55
0500H	51.5	0500H	55.0	0500H	68.4	55
0600H	51.9	0600H	55.9	0600H	73.2	60
0700H	52.0	0700H	56.0	0700H	73.8	60
0800H	52.5	0800H	56.0	0800H	73.6	60
0900H	52.8	0900H	56.0	0900H	74.0	60
1000H	52.0	1000H	56.1	1000H	72.5	65
1100H	52.0	1100H	56.4	1100H	72.0	65
1200H	52.9	1200H	56.9	1200H	72.8	65
1300H	52.0	1300H	55.3	1300H	72.5	65
1400H	51.6	1400H	55.7	1400H	72.8	65
1500H	52.0	1500H	56.1	1500H	72.9	65
1600H	52.5	1600H	56.1	1600H	73.0	65
1700H	52.9	1700H	56.4	1700H	73.6	65
1800H	52.6	1800H	56.8	1800H	73.9	65
1900H	52.5	1900H	56.7	1900H	74.3	60
2000H	52.6	2000H	56.1	2000H	68.2	60
2100H	51.0	2100H	55.7	2100H	61.5	60
2200H	50.8	2200H	54.2	2200H	60.4	60
2300H	50.7	2300H	54.0	2300H	59.4	55



Results of Social Surveys

1

List of Barangays Affected by the Cavite Expressway

Province	Municipality	Barangay	Number of Barangay
Cavite Expressway			
Laguna	**Santa Rosa**	**Don Jose, Sto. Domingo, Malitlit**	**3**
Cavite	Dasmariñas	Langkaan I	1
	General Trias	San Francisco	1
	Silang	Batas, Biluso, Carmen, Biga I, Malaking Tatiao, Iba, Munting Ilog, Sabutan, Tibig	9
		Total for Cavite Expressway	14

2

Focus Group Discussion
(Barangay Consultation)

- **Agenda**
  -Outline of the proposed projects,
  -Proposed alternative road alignments,
  -Coordination on social surveys,
  -Q&A (discussion)
- **Participants**
  -Barangay captains and councilors,
  -Project-affected persons, Residents,
  -Peoples organizations (PO),
  -Non-governmental organizations (NGO)
- **Resolutions by Barangay for acceptance of the project**
  =>Resolutions for endorsement of the acceptance of the Project by Municipalities and Provinces

3

Focus Group Discussion
(Barangay Consultation)

Issues & Concern

- Is the alignment final?
- Will there be compensation for affected assets? When? What is the basis for valuation?
- Is there a ready relocation site?
- How will existing business establishment be compensated?
- Will there be alternative income source in the relocation site?
- What documents are needed as proof of ownership?

4

Results of the Perception Survey

- Perception Survey
  - 700 sampled households from project-affected barangays
    (Indirect affected households from the ROW acquisition)

+

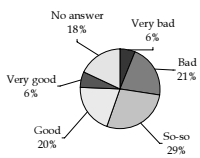
- Household inventory survey for resettlement
  - 800 households to be potentially resettled
    (Direct affected households from the ROW acquisition, only in Cavite and none in Laguna)

5

Results of the Perception Survey
(Impression on present road conditions)

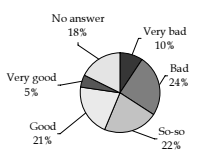
Aguinald Highway

Governor's Drive



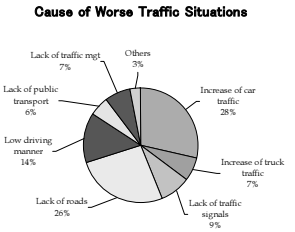
Manila–Cavite Coastal Expressway

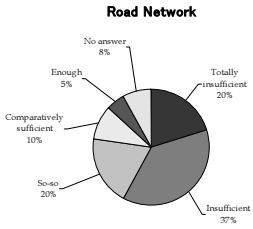
SLEX



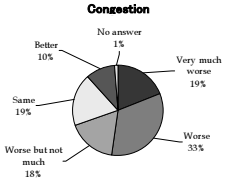
6

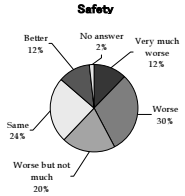
Results of the Perception Survey
(Impression on present road conditions)

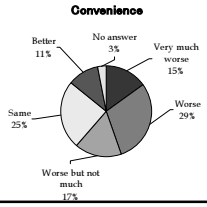




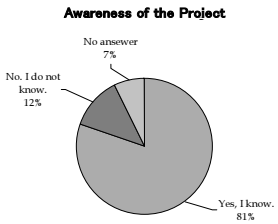
Results of the Perception Survey
(Impression on present road conditions: Comparison to past situation)

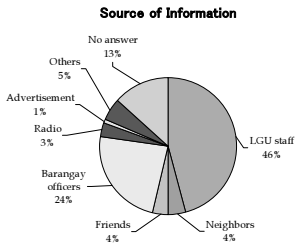




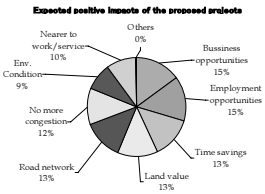


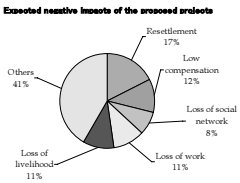
Results of the Perception Survey
(Awareness of the proposed projects)

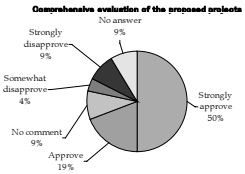




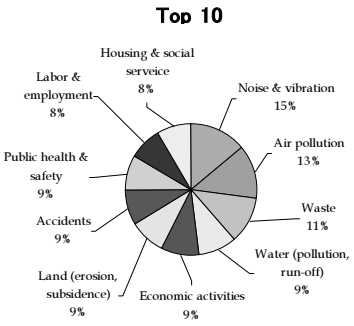
Results of the Perception Survey
(Intention on implementation of the proposed projects)







Results of the Perception Survey
(Social and environmental concerns on the proposed projects)



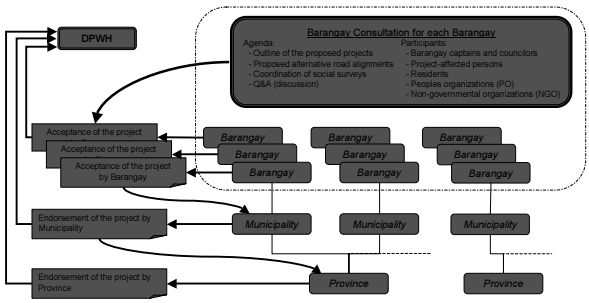
Results of the Social Survey
(Household Interview Survey for Resettlement)

- No relocation in Laguna
- All potential households to be resettled: approx. 800 HHs (only in Cavite)
- Survey methods
  1. Direct interview of households to be potentially relocated (Incl. questions on perception of the project)
  2. Assigning of survey control number to the housing units
  3. Location/marking of interviewed households on community spot map
  4. Photo record of the housing unit
- Main Items of the Inventory
  - Residential condition
    - Lot size, floor area, duration of occupancy, housing type, housing materials/appearance, tenure status/land status, household income
  - Intention of the resettlement
    - Acceptability, preferred relocation site

Consensus Building Process for Implementation of the Proposed Projects

13

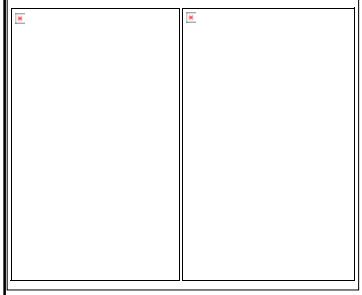
Consensus Building Process for Implementation of the Proposed Projects (Barangay Consultations and Issue of Resolutions)



14

Consensus Building Process for Implementation of the Proposed Projects (Issue of Resolutions by LGUs)

- Resolution of Municipality
  - General Trias, Cavite



- Resolution of Barangay
  - Talaba III, Bacoor, Cavite

15

Status of Issue of the Resolutions (Laguna)

Province	Municipality	Barangay	Barangay Resolution	Municipal Resolution
Laguna	Santa Rosa City	Don Jose	(To follow)	Discussion with SB to be scheduled.
		Sto. Domingo	(To follow)	
		Malitlit	(To follow)	

16

Consensus Building Process for Implementation of the Proposed Projects

Perception Survey
- Sampled households from project-affected barangays

Household Interview Survey for Resettlement
- All households to potentially be resettled
- Incl. questions on perception of the project

5th Stakeholder Meeting
- Conclusion of the consensus building results

Focus Group Discussion (Barangay Consultation)
- Agenda: Outline of the proposed projects, Proposed alternative road alignments, Coordination on social surveys, Q&A (discussion)
- Participants: Barangay captains and councilors, Project-affected persons, Residents, Peoples organizations (PO), Non-governmental organizations (NGO)
- Acceptance of the project by Barangay

=>Endorsement of the Acceptance of the Project by Municipalities and Provinces

17

Next Steps for ESC

- Further examination of the impact assessment
- Examinations of mitigation measures
- Preparation of environmental management and monitoring plan based on the project implementation plan
- Stakeholder Meetings

18

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

THE FEASIBILITY STUDY AND IMPLEMENTATION SUPPORT ON THE CALA EAST-WEST NATIONAL ROAD PROJECT

5th Stakeholders' Meeting in Laguna

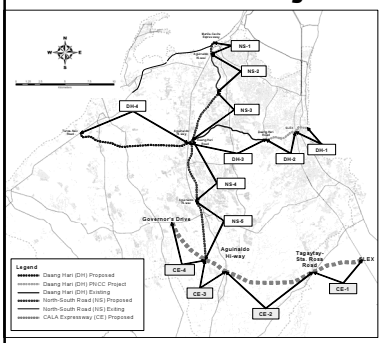
Session 2 : Outline of the Study Progress and Further Arrangements

14 March 2006

Topics

1. Overall Evaluation on Project Viability
2. Concepts of Implementation Mechanisms
3. Implementation Role of Key Players
   - Preparatory Activities
   - Key Players and their Roles for Project Implementation

Projects



NS 1-3	6 lanes, tolled
NS 4-5	6 lanes
DH1	BOT Project, not yet analyzed
DH2	PNCC Project, 4 lanes, tolled
DH3	4 lanes, existing (not completed)
DH4	4 lanes (ROW 30m)
CE 1-4	**6 lanes (initially 4 lanes)**
CE 5-6	Not included in the study

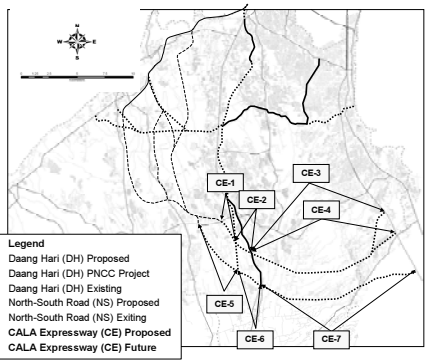
CALA Expressway

Expressway (50m-ROW, 6 lanes)

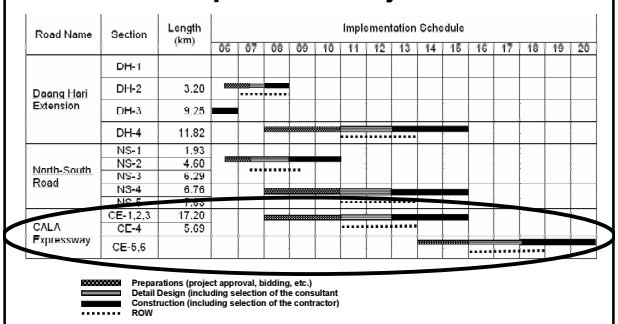
Alternative 1
CE-1~2+CE-3 = 18.5km

Alternative 2
CE-1~2+CE-4 = 19.6km

Alternative 3 (selected)
CE-5~7 = 22.8km
Now called CE 1 to CE 4



Assumed Implementation Schedule of the Proposed Road Projects

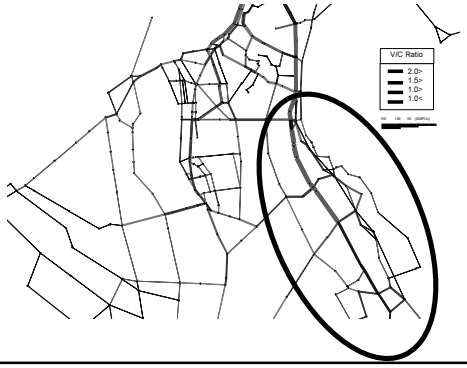


Future Traffic Demand

Project Component		Length (km)	Capacity (000PCU/ day)	Volume (000PCU)			V/C Ratio		
				2015	2020	2030	2015	2020	2030
CE	-1	5.14	98.0	115.9	152.8	187.6	1.18	1.56	1.91
	-2	9.52	98.0	106.7	134.9	181.7	1.09	1.38	1.85
	-3	2.54	98.0	112.1	156.4	209.2	1.14	1.60	2.13
	-4	5.69	98.0	55.3	101.7	139.7	0.56	1.04	1.43
	total	22.91	98.0	94.8	130.5	174.3	0.97	1.33	1.78

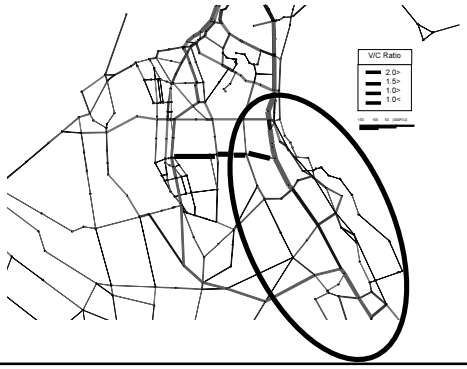
Result of Traffic Assignment (2010)

(Following Assumed Implementation Schedule)



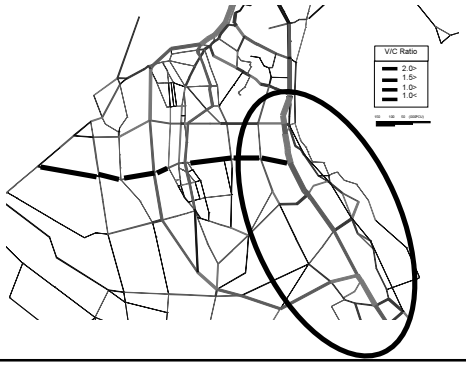
Result of Traffic Assignment (2015)

(Following Assumed Implementation Schedule)



Result of Traffic Assignment (2020)

(Following Assumed Implementation Schedule)



Result of Traffic Assignment (2020)

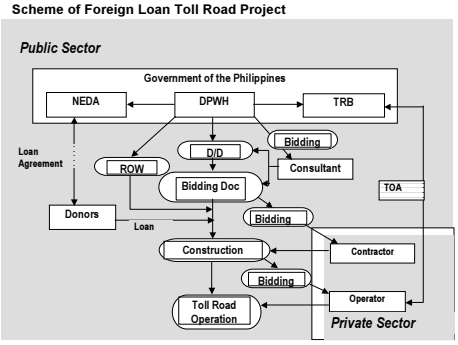
(Without Any Road Projects)

Economic Evaluation

	Cost Estimate of Road (Billion Pesos)	Benefit (Billion Pesos/ year) (2020)	Evaluation		
			EIRR	NPV (Billion Pesos)	B/C
CALA Expressway	15.0	51.6	33.0	41.0	4.5
E/W 1 (Daang Hari Ext.)	4.6	29.4	41.1	26.2	7.8
N/S 3 (Bacoor-Dasmariñas)	3.0	21.1	42.7	19.0	8.6

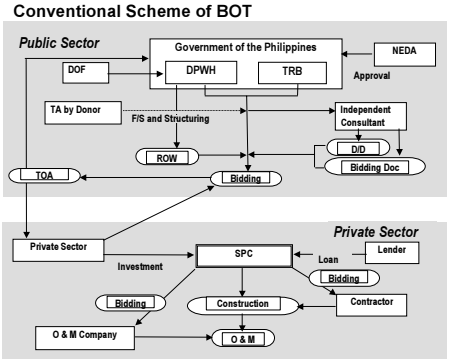
Existing Implementation Schemes

Scheme of Foreign Loan Toll Road Project

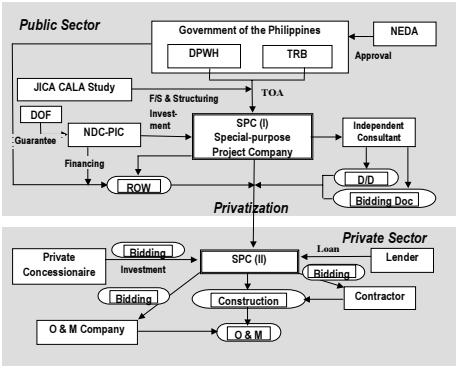


Existing Implementation Schemes

Conventional Scheme of BOT



Exploring New BOT Scheme for CALA Highway Project with NDC-PIC's Participation



Implementation Scenarios

1. Conventional

- **N-S and E-W Roads are implemented in stages, by DPWH, as national open-access, non-toll roads. Financing to come from capital budget of DPWH and donor loan.**
- **DH2 to link Daang Hari to SLEX to depend entirely on PIC/PNCC efforts. Molino Blvd remains an open road, including new section through One Asia.**

2. Possible NDC-PIC Participation

- **N-S Road (NS1, NS2, NS3 and DH2) are built as toll roads by special-purpose project company initially capitalized by NDC, granted a Concession Agreement by TRB, and subsequently transferred via open tender to the private sector.**
- **E-W roads (DH3 and DH4) and rest of NS sections (NS4, NS5, and CE1 to CE3) are implemented by DPWH as national, open-access, non-toll roads with financing from capital budget and donor loan.**

Advantages of NDC-PIC Participation:

- **Early implementation of some sections.**
- **Less outlays from DPWH budgets.**
- **Advance ROW acquisition becomes possible for some other road sections.**

Responsibilities for Implementation

CALA Expressway (non-Toll)

DPWH to lead implementation on conventional public sector financing mode

North-South (NS1-NS3:Tolled)

NDC/PIC to lead implementation via BTO scheme

East-West (DH2: Tolled)

NDC/PIC/PNCC to implement toll road via BTO scheme

Preparatory Activities

PLANNING

- ❑Feasibility Studies
  - Concensus, Endorsements & Resolutions/Ordinances
  - Parcellary mapping (pending approval)
- ❑Detailed Engineering (Design)
  - ROW acquisition details
  - Tender documents
- ❑Line up financing for construction
  - NEDA-ICC approval
  - Loan Appraisal & Negotiation

IMPLEMENTATION

- ❑Bid and Award of construction contracts
- ❑ROW Acquisition
  - Writ of possession
  - Relocation of affected residents
- ❑Construction
  - Relocate utilities, if any
  - Construction supervision
  - QA/QC

Implementation Role of Key Players

NGUs

DPWH:
- Prepare F/S & DE
- Acquire ROW
- Bid-out construction of roads
- Supervise construction
- Maintain completed roads

DENR:
- Review & approve ECC
- Monitor ECC compliance during construction

DOF: negotiates foreign & domestic loan financing

DBM: releases funds per GAA

NHA: executes resettlement program

LGUs

Barangay:
- Endorse road project
- Identifies affected residents & assist in relocation, if any

Municipality/City:
- Resolution endorsing project
- Freeze land use classification and zonal valuation of ROW
- Facilitate ROW acquisition (land titles, suasion on owners, assist in relocation, etc.)
- Supplemental funds for ROW & feeder roads

Province:
- Resolution endorsing the project
- Issue ordinance for ROW protection
- Coordinates support of municipalities along road alignment

Implementation Role of Other Players

For TOLL ROADS

NDC/PIC:
- Provide seed equity for toll project company that will have toll concession
- Advance funds for ROW
- Harness private sector participation in the project company
- Advance funds for pre-construction activities, such as for DE

TRB: grants toll concession

IFC/Lenders: provide long term loans to the project company, to finance construction

TPC: toll project company builds and operates the toll road

For Non-Toll ROADS

Donor/Foreign Lenders:
- Provide long-term concessional loans, to finance road construction
- Oversight of construction to ensure funds are disbursed according to approved plans/programs

Congressmen:
- Lobbies for inclusion in GAA as early as possible
- Allocates CDF for early ROW acquisition and/or relocation of affected constituencies

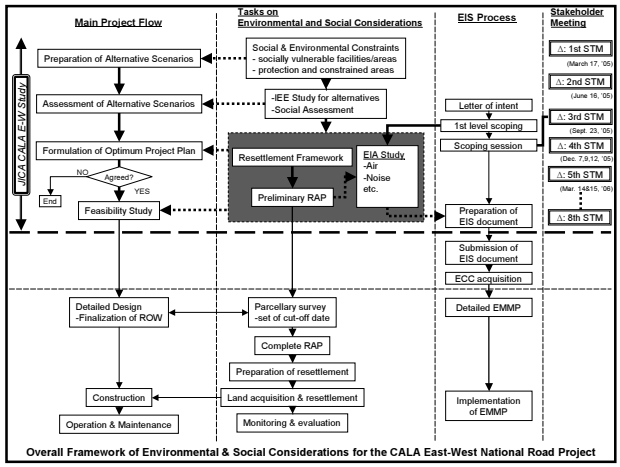
THANK YOU

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

THE FEASIBILITY STUDY AND IMPLEMENTATION SUPPORT ON THE CALA EAST-WEST NATIONAL ROAD PROJECT
5th Stakeholders' Meeting in Cavite

Session 1 :
Environment and Social Considerations (ESC) Study

15 March 2006



Overall Framework of Environmental & Social Considerations for the CALA East-West National Road Project

Stakeholder Meetings

No.	Study Phase	Main Subjects	Period
1st	Preparation of Scenarios	· Study Outline · Past, Ongoing & Future Transport Projects · Scope of Stakeholders, · Schedule & Objectives of Future Stakeholder Meetings	March 17, 2005
2nd	Evaluation of Scenarios	· Alternative Development Scenarios · Environmental Framework:Social and Natural Environment · Alternative Scenarios for Regional Transport Network	June 16, 2005
3rd	Preparation of Optimum Project Plan	· Outline of alternatives · Alternative measure in zero option · Scope and evaluation methodologies for Environmental and Social Considerations Study (EIA level) · Obtain opinion on concerned environmental impacts *(This STM is the Official Scoping Session under EIS Process)*	Sept. 23, 2005
4th		· Results of evaluation on alternatives · Progress and interim results of ESC study (EIA level) · Study framework on preparation of optimum project plan	Dec.7 (Cavite) Dec. 8 (Laguna) Dec.12 (Muntenlupa), 2005
5th		· Results of ESC study (EIA level) · Implementation arrangements of the project · Mutual consent on optimum project	Mar.14 (Laguna) Mar.15 (Cavite), 2006
6th	F/S	· Outline of F/S · Follow-up of ESC study (EIA level) · Explanation of resettlement policy	Mid-May, 2006
7th		· Progress of the F/S · Explanation of framework of RAP	Early July, 2006
8th		· Outline of results of F/S · Mutual consent on framework of RAP · Further arrangement and requirement for the implementation	Early Sept., 2006

Results of the Environmental & Social Considerations Study

- Environmental Baseline Study
  - Field measurement surveys: air, noise/vibration, water
  - Secondary data collection
- Social Survey
  - Focus group discussion (Barangay consultation)
  - Perception survey
    - 700 sampled households from project-affected barangays
  - Household inventory survey for resettlement
    (100% survey for potential households to be resettled for ROW acquisition)
    - Approx. 800 households
- Impact Assessment

Results of Baseline Surveys

ENVIRONMENT AND SOCIAL CONSIDERATION STUDY
Feasibility Study and Implementation Support for the Cavite-Laguna (CALA) East-West National Road Project

Introduction

Presidential Decree No. 1586 (PD 1586), otherwise known as the "Philippine Environmental Policy", is considered the first issuance on Environmental Impact Statement (EIS) system in the Philippines, effective in 1977. PD 1586 requires "all agencies an instrumentalities of the national government, including government-owned and controlled corporations, as well as private corporations, firms and entities to prepare an environmental impact statement for every action, project or undertaking which significantly affects the environment."

Major roads are considered as Environmentally Critical Projects and hence require the preparation of an EIS and secure an Environmental Compliance Certificate (ECC).

ENVIRONMENTAL BASELINE STUDY

Objective

The main objective of the Environmental Baseline Study is to collect environmental baseline information in order to characterize the existing environmental condition of the project area and identify and assess potential impacts on its social and natural environment.

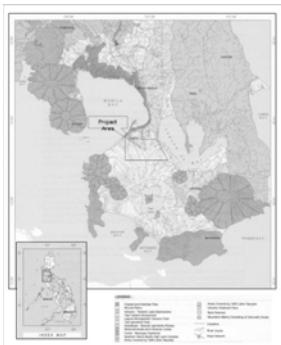
Main Task of the Environmental Baseline Study

1) **Collection and review of existing secondary data**
2) **Field Surveys**
   a) **Air quality sampling**
   b) **Noise and vibration level measurement**
   c) **Water quality sampling**
   d) **Reconnaissance survey on natural conditions**

THE STUDY AREA
PHYSICAL ENVIRONMENT
I . GEOLOGY

Regional Topography and Geomorphology

The project area lies on the northern portion of the Southwest Luzon Uplands. The regional landscape is characterized by Gently sloping to rugged mountainous terrain abutting to a wide Central plain area marked by freshwater lakes (Laguna Lake and Taal lake). The project area is situated on slightly elevated Sloping region on the northern portion of the Taal Ignibrite Field, a sequence of Quaternary pyroclastic deposits and east of the Coastal areas of Cavite.



Regional Geology

The Laguna volcanic plain was created by the volcanic activities that formed the Taal Volcano and neighboring volcanic vents. The volcanoclastic rocks underlying the project area appear to have been expelled mostly from Taal Volcano. The active volcanism provided for the large volume and thick accumulation of volcanic ejectamenta or pyroclasts at sites of deposition at a distance from the volcano source.

The volcanic materials were later eroded and transported by surface water to lower areas where they underwent some sorting that resulted in occasional beds of well-sorted tuffaceous sands and gravel.

Regional Geology

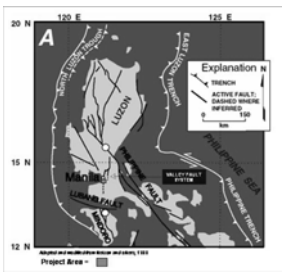
The Laguna volcanic plain is bounded to the west by a fault, known as the West Valley Fault (WVF), that trends north-south from Muntalan to Tagaytay Ridge and traverses west of Carmona. The trace of the fault from Muntinlupa area and about 5kms west of the Project Site is generally not very clear, ut the abrupt ascent of the land (Carmona area) towards Tagaytay suggests the presence of the fault. The eastern block of WVF moved downward relative to the western block

Regional Tectonic Setting

Luzon Island is situated at the western margin of the Circum-Pacific region, centered roughly at 15ºN latitude and 121ºE longitude. The region is characterized y an active convergence between the Eurasian and Pacific plates.

Two active subduction systems of opposing polarity border Luzon: the eastward-dipping Manila trench on the west, and the incipient, northward-propagating, westward-dipping east Luzon trench, on the east.

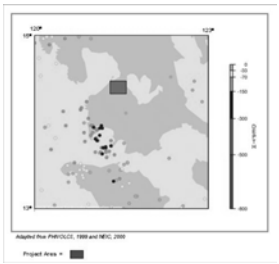
At the Laguna and Cavite sector, volcanic rocks show marked difference in chemical composition from typical arc-related calc-alkaline volcanics. A NE-SW trending “rift” structure – referred to as the Macolod Corridor was proposed to account for this geochemical variation.



Regional Seismicity

Earthquake events tend to cluster in the offshore region along the Verde Island Passage between the southeast coast of Batangas and Mindoro Island. Moderate to deep (> 150 kms) foci seismic events with a predominant thrust focal mechanism solution indicate active convergence along the southern extension of the Manila Trench system. In contrast, shallow seismic events (<70kms) appear to have originated from th movements of regional faults (e.g. Mindoro Fault, Lubang Fault) and their minor splays.

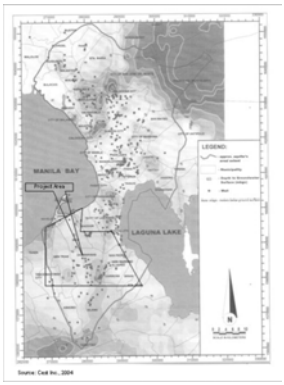
A single event located within Taal Lake is of volcanic origin associated with the 1965 eruption of Taal Volcano.



THE STUDY AREA
PHYSICAL ENVIRONMENT
II . HYDROGEOLOGY

Hydrogeologic Units

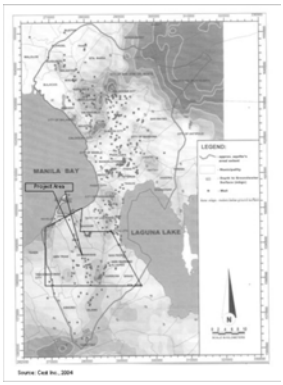
- **Quaternary Volcanic Sediments**
  The Quaternary volcanic sediments form the main host of the underlying aquifers of the project area. It consists of layers of tuffaceous pebbly sandstone or tuff, which are all capable of storing and transmitting large quantities of groundwater. Known production yields are almost about 20 liters per second (lps) but as high as 60 lps I some areas. The aquifers are under confined to semi-confined conditions.



II . HYDROGEOLOGY

Hydrogeologic Units

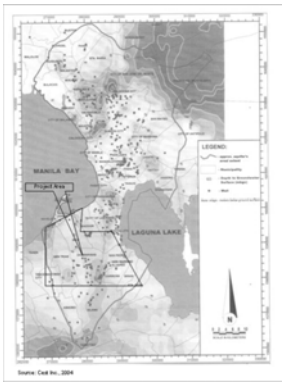
- **Quaternary Alluvium**
  The Quaternary alluvium are recent unconsolidated alluvial deposits that consists of clay, silt, sand and gravel along coastal areas, river beds and floodplains. Alluvial deposit acquifers in coastal areas are restricted by sea water intrusion while inland aquifers are restricted by low storage due to limited aquifer area and/or thickness. Well yields are mostly about 2 lps but as high as 20 lps in some areas. Shallow acquifers are under unconfined conditions.



II . HYDROGEOLOGY

Groundwater Levels

Groundwater depths at the project area ranges from 60 meters below ground surface (mbgs.) to 100 mbgs.

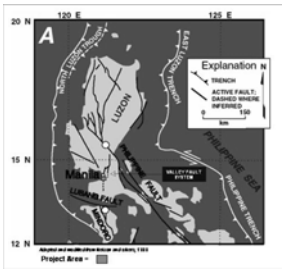


THE STUDY AREA
PHYSICAL ENVIRONMENT
III . NATURAL HAZARDS

Seismic Hazards

Of the known major tectonic structures in the region, the nearest earthquake generator to the project site is the extension of the West Valley Fault (WVF).

A paleoseismic study (Nelson and others, 2000) suggests that the northern part of this fault has a recurrence interval of 200-400 years for magnitude 6-7 earthquakes on the fault for an annual probability rate of 0.5% to 0.25%.



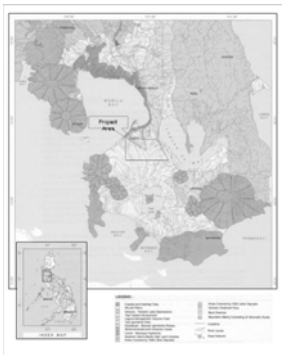
III . NATURAL HAZARDS

Volcanic Hazards

The nearest active volcano within the vicinity of the Project area is Taal Volcano. Eruption-related volcanic hazards for Taal volcano would include airfall tephra, base surge, fissuring and ground subsidence, seiches/tsunami and flooding.

Considering the more than 25-km distance of the Project Site to Taal Volcano, it is unlikely that the area will be directly and adversely affected by eruption-related volcanic hazards from the volcano.

At most the area may be affected by minial ash fall if wind speed and direction were favorably directed towards its location.



III . NATURAL HAZARDS

Foundation Hazards

Paleosol horizons are known to occur in the pyroclastics at the project area. With contrasting textural types of the under lying foundation, the area is susceptible to differential settlement or long-term settlement.

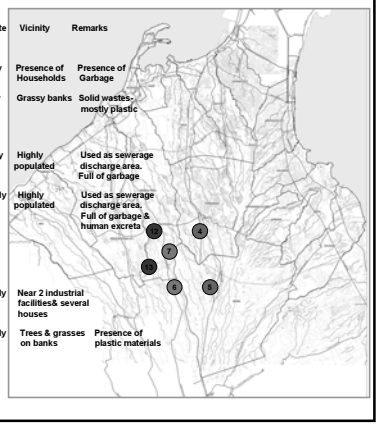
The damage attributable to settlement can range from complete failure of the structure to slight disfigurement.

Settlement can be reduced:

•if the site is preloaded or surcharged prior to construction, or
•if the soil is subjected to dynamic compaction or vibrocompaction.

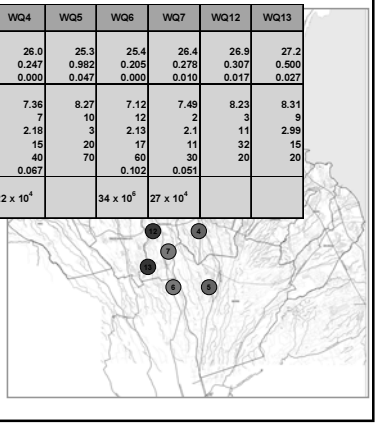
IV . WATER QUALITY

	Water Depth	Color	Substrate	Vicinity	Remarks
Imus River Basin					
WQ4	Very Shallow	Murky Brown	Muddy	Presence of Households	Presence of Garbage
WQ5	Shallow	Clear Green	Sandy	Grassy banks	Solid wastes, mostly plastic
Ilang-ilangRiver Basin					
WQ6	Shallow	Dark Brown	Muddy	Highly populated	Used as sewerage discharge area. Full of garbage
WQ7	Shallow	Brown Brown	Muddy	Highly populated	Used as sewerage discharge area. Full of garbage & human excreta
Rio Grande River Basin					
WQ12	Shallow	Clear	Sandy	Near 2 industrial facilities& several houses	
WQ13	Shallow	Clear	Sandy	Trees & grasses on banks	Presence of plastic materials



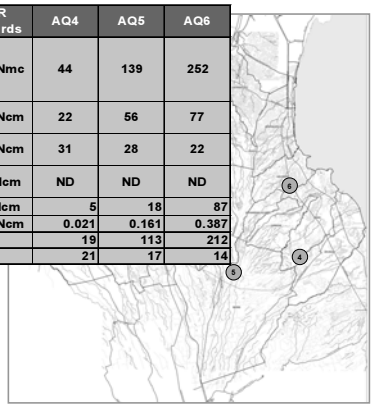
III . WATER QUALITY

PARAMETERS	DENR Standards	WQ4	WQ5	WQ6	WQ7	WQ12	WQ13
Physical Characteristics							
Temperature	-	26.0	25.3	25.4	26.4	26.9	27.2
Conductivity (ms/cm)	-	0.247	0.982	0.205	0.278	0.307	0.500
Salinity (ppm)	-	0.000	0.047	0.000	0.010	0.017	0.027
Chemical Characteristics							
pH	6.5 - 9.0	7.36	8.27	7.12	7.49	8.23	8.31
BOD	7(10)mg/L	7	10	12	2	3	9
DO	5.0 mg/L	2.18	3	2.13	2.1	11	2.99
Turbidity	NTU	15	20	17	11	32	15
TSS	60 mg/L inc.	40	70	60	30	20	20
Lead	0.05 gm/L	0.067		0.102	0.051		
Biological Characteristics							
Total coliform	5,000 MPN/100mL	22×10^4		34×10^6	27×10^4		



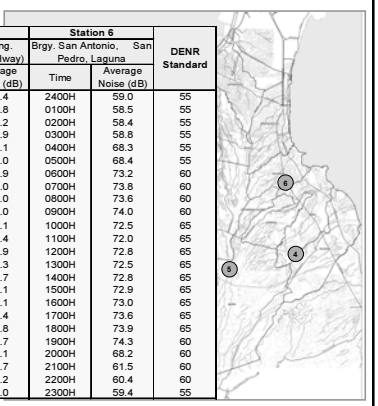
V . AIR QUALITY

PARAMETERS	DENR Standards	AQ4	AQ5	AQ6
Total Suspended Prticulates (TSP)	230 ug/Nmc	44	139	252
Sulfur Dioxide (SO_2)	180 ug/Ncm	22	56	77
Nitrogen Dioxide (NO_2)	150 ug/Ncm	31	28	22
Carbon Oxide (CO)	35 ug/Ncm	ND	ND	ND
Ozone (O_3)	140 ug/Ncm	5	18	87
Lead (Pb)	1.50 ug/Ncm	0.021	0.161	0.387
SPM	-	19	113	212
NO	-	21	17	14



VI . NOISE LEVEL

Station 4		Station 5		Station 6		DENR Standard
R.C. Sta. Rosa Centro, Sta. Rosa, Laguna		Brgy. Biga I, Silang. Cavite (Aguinaldo Hway)		Brgy. San Antonio, San Pedro, Laguna		
Time	Average Noise (dB)	Time	Average Noise (dB)	Time	Average Noise (dB)	
2400H	50.6	2400H	52.4	2400H	59.0	55
0100H	50.8	0100H	50.8	0100H	58.5	55
0200H	50.2	0200H	50.2	0200H	58.4	55
0300H	50.4	0300H	50.9	0300H	58.8	55
0400H	51.5	0400H	54.1	0400H	68.3	55
0500H	51.5	0500H	55.0	0500H	68.4	55
0600H	51.9	0600H	55.9	0600H	73.2	60
0700H	52.0	0700H	56.0	0700H	73.8	60
0800H	52.5	0800H	56.0	0800H	73.6	60
0900H	52.8	0900H	56.0	0900H	74.0	60
1000H	52.0	1000H	56.1	1000H	72.5	65
1100H	52.0	1100H	56.4	1100H	72.0	65
1200H	52.9	1200H	56.9	1200H	72.8	65
1300H	52.0	1300H	55.3	1300H	72.5	65
1400H	51.6	1400H	55.7	1400H	72.8	65
1500H	52.0	1500H	56.1	1500H	72.9	65
1600H	52.5	1600H	56.1	1600H	73.0	65
1700H	52.9	1700H	56.4	1700H	73.6	65
1800H	52.6	1800H	56.8	1800H	73.9	65
1900H	52.5	1900H	56.7	1900H	74.3	60
2000H	52.6	2000H	56.1	2000H	68.2	60
2100H	51.0	2100H	55.7	2100H	61.5	60
2200H	50.8	2200H	54.2	2200H	60.4	60
2300H	50.7	2300H	54.0	2300H	59.4	55



Results of Social Surveys

1

List of Barangays Affected by the Cavite Expressway

Province	Municipality	Barangay	Number of Barangay
Cavite Expressway			
Laguna	**Santa Rosa**	**Don Jose, Sto. Domingo, Malitlit**	**3**
Cavite	Dasmariñas	Langkaan I	1
	General Trias	San Francisco	1
	Silang	Batas, Biluso, Carmen, Biga I, Malaking Tatiao, Iba, Munting Ilog, Sabutan, Tibig	9
		Total for Cavite Expressway	14

2

Focus Group Discussion
(Barangay Consultation)

- **Agenda**
  -Outline of the proposed projects,
  -Proposed alternative road alignments,
  -Coordination on social surveys,
  -Q&A (discussion)
- **Participants**
  -Barangay captains and councilors,
  -Project-affected persons, Residents,
  -Peoples organizations (PO),
  -Non-governmental organizations (NGO)
- **Resolutions by Barangay for acceptance of the project**
  =>Resolutions for endorsement of the acceptance of the Project by Municipalities and Provinces

3

Focus Group Discussion
(Barangay Consultation)

Issues & Concern

- Is the alignment final?
- Will there be compensation for affected assets? When? What is the basis for valuation?
- Is there a ready relocation site?
- How will existing business establishment be compensated?
- Will there be alternative income source in the relocation site?
- What documents are needed as proof of ownership?

4

Results of the Perception Survey

- Perception Survey
  - 700 sampled households from project-affected barangays
    (Indirect affected households from the ROW acquisition)

+

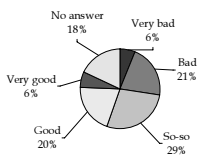
- Household inventory survey for resettlement
  - 800 households to be potentially resettled
    (Direct affected households from the ROW acquisition, only in Cavite and none in Laguna)

5

Results of the Perception Survey
(Impression on present road conditions)

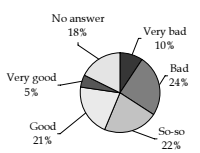
Aguinald Highway

Governor's Drive



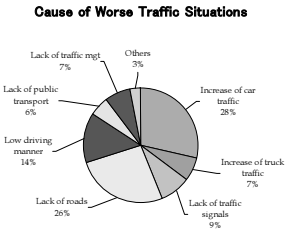
Manila–Cavite Coastal Expressway

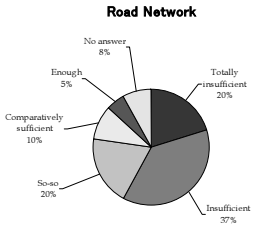
SLEX



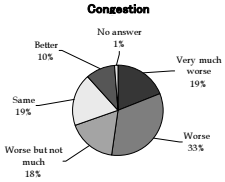
6

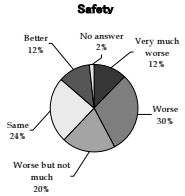
Results of the Perception Survey
(Impression on present road conditions)

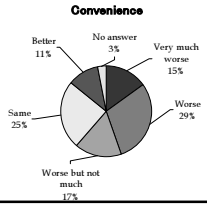




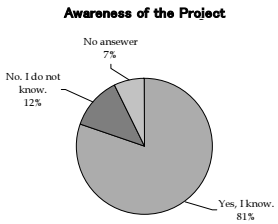
Results of the Perception Survey
(Impression on present road conditions: Comparison to past situation)

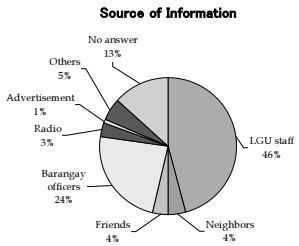




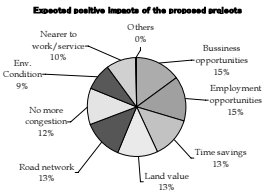


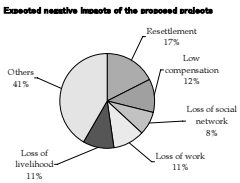
Results of the Perception Survey
(Awareness of the proposed projects)

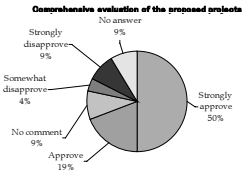




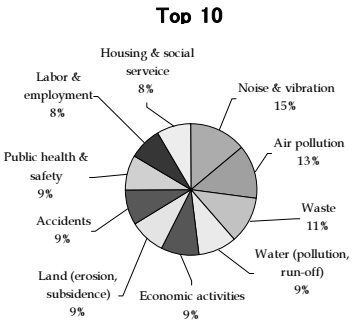
Results of the Perception Survey
(Intention on implementation of the proposed projects)







Results of the Perception Survey
(Social and environmental concerns on the proposed projects)



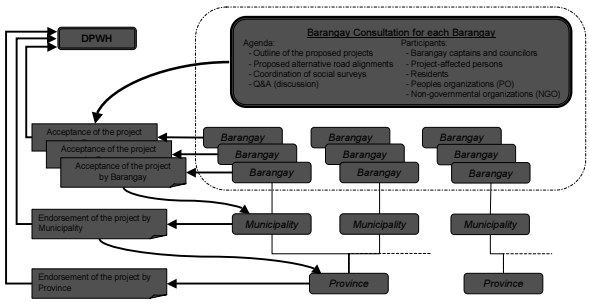
Results of the Social Survey
(Household Interview Survey for Resettlement)

- No relocation in Laguna
- All potential households to be resettled: approx. 800 HHs (only in Cavite)
- Survey methods
  1. Direct interview of households to be potentially relocated (Incl. questions on perception of the project)
  2. Assigning of survey control number to the housing units
  3. Location/marking of interviewed households on community spot map
  4. Photo record of the housing unit
- Main Items of the Inventory
  - Residential condition
    - Lot size, floor area, duration of occupancy, housing type, housing materials/appearance, tenure status/land status, household income
  - Intention of the resettlement
    - Acceptability, preferred relocation site

Consensus Building Process for Implementation of the Proposed Projects

13

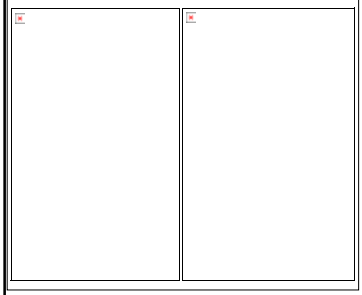
Consensus Building Process for Implementation of the Proposed Projects (Barangay Consultations and Issue of Resolutions)



14

Consensus Building Process for Implementation of the Proposed Projects (Issue of Resolutions by LGUs)

- Resolution of Municipality
  - General Trias, Cavite



- Resolution of Barangay
  - Talaba III, Bacoor, Cavite

15

Status of Issue of the Resolutions (Laguna)

Province	Municipality	Barangay	Barangay Resolution	Municipal Resolution
Laguna	Santa Rosa City	Don Jose	(To follow)	Discussion with SB to be scheduled.
		Sto. Domingo	(To follow)	
		Malitlit	(To follow)	

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Consensus Building Process for Implementation of the Proposed Projects

Perception Survey
- Sampled households from project-affected barangays

Household Interview Survey for Resettlement
- All households to potentially be resettled
- Incl. questions on perception of the project

5th Stakeholder Meeting
- Conclusion of the consensus building results

Focus Group Discussion (Barangay Consultation)
- Agenda: Outline of the proposed projects, Proposed alternative road alignments, Coordination on social surveys, Q&A (discussion)
- Participants: Barangay captains and councilors, Project-affected persons, Residents, Peoples organizations (PO), Non-governmental organizations (NGO)
- Acceptance of the project by Barangay

=>Endorsement of the Acceptance of the Project by Municipalities and Provinces

17

Next Steps for ESC

- Further examination of the impact assessment
- Examinations of mitigation measures
- Preparation of environmental management and monitoring plan based on the project implementation plan
- Stakeholder Meetings

18

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

THE FEASIBILITY STUDY AND IMPLEMENTATION SUPPORT ON THE CALA EAST-WEST NATIONAL ROAD PROJECT

5th Stakeholders' Meeting in Laguna

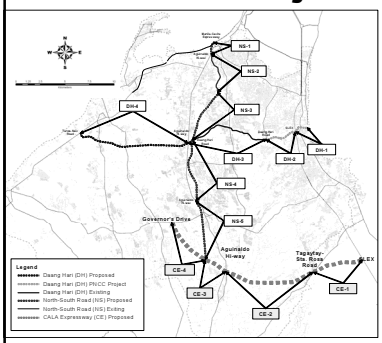
Session 2 : Outline of the Study Progress and Further Arrangements

14 March 2006

Topics

1. Overall Evaluation on Project Viability
2. Concepts of Implementation Mechanisms
3. Implementation Role of Key Players
   - Preparatory Activities
   - Key Players and their Roles for Project Implementation

Projects



NS 1-3	6 lanes, tolled
NS 4-5	6 lanes
DH1	BOT Project, not yet analyzed
DH2	PNCC Project, 4 lanes, tolled
DH3	4 lanes, existing (not completed)
DH4	4 lanes (ROW 30m)
CE 1-4	**6 lanes (initially 4 lanes)**
CE 5-6	Not included in the study

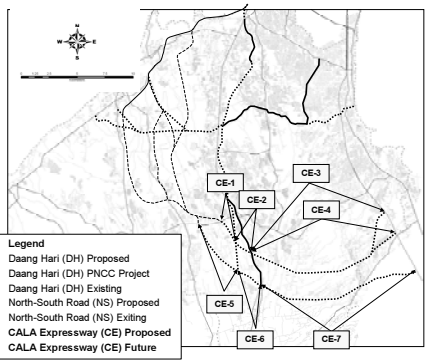
CALA Expressway

Expressway (50m-ROW, 6 lanes)

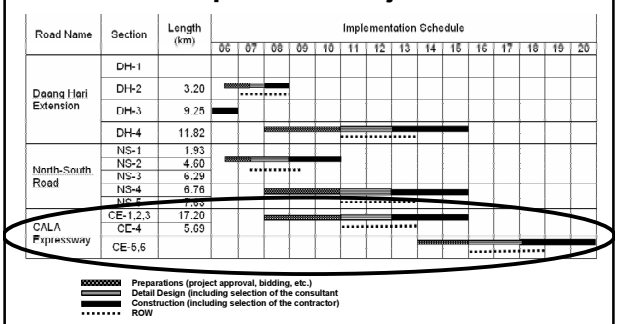
Alternative 1
CE-1~2+CE-3 = 18.5km

Alternative 2
CE-1~2+CE-4 = 19.6km

Alternative 3 (selected)
CE-5~7 = 22.8km
Now called CE 1 to CE 4



Assumed Implementation Schedule of the Proposed Road Projects

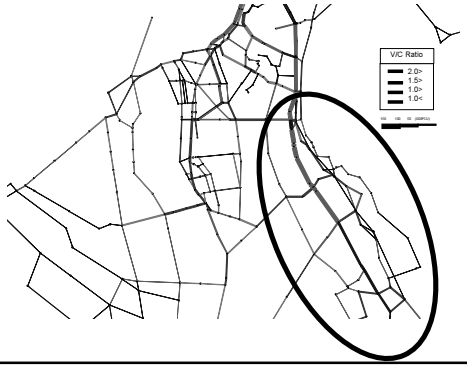


Future Traffic Demand

Project Component		Length (km)	Capacity (000PCU/ day)	Volume (000PCU)			V/C Ratio		
				2015	2020	2030	2015	2020	2030
CE	-1	5.14	98.0	115.9	152.8	187.6	1.18	1.56	1.91
	-2	9.52	98.0	106.7	134.9	181.7	1.09	1.38	1.85
	-3	2.54	98.0	112.1	156.4	209.2	1.14	1.60	2.13
	-4	5.69	98.0	55.3	101.7	139.7	0.56	1.04	1.43
	total	22.91	98.0	94.8	130.5	174.3	0.97	1.33	1.78

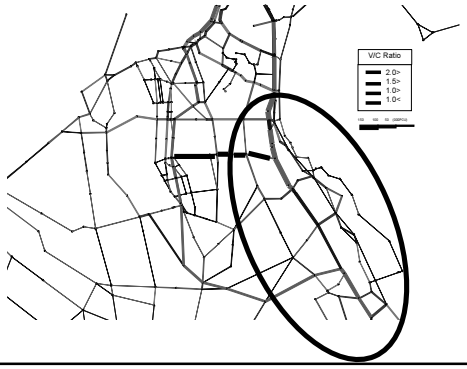
Result of Traffic Assignment (2010)

(Following Assumed Implementation Schedule)



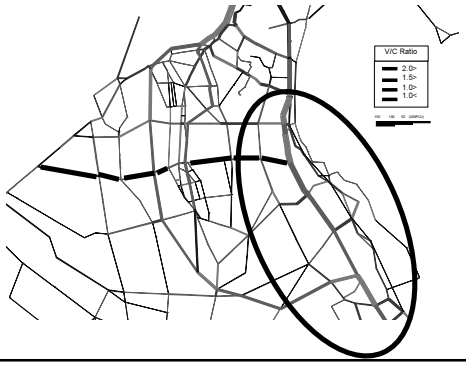
Result of Traffic Assignment (2015)

(Following Assumed Implementation Schedule)



Result of Traffic Assignment (2020)

(Following Assumed Implementation Schedule)



Result of Traffic Assignment (2020)

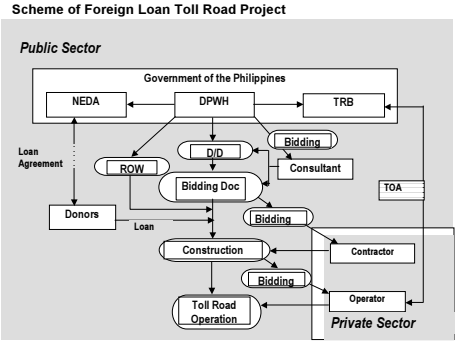
(Without Any Road Projects)

Economic Evaluation

	Cost Estimate of Road (Billion Pesos)	Benefit (Billion Pesos/ year) (2020)	Evaluation		
			EIRR	NPV (Billion Pesos)	B/C
CALA Expressway	15.0	51.6	33.0	41.0	4.5
E/W 1 (Daang Hari Ext.)	4.6	29.4	41.1	26.2	7.8
N/S 3 (Bacoor-Dasmariñas)	3.0	21.1	42.7	19.0	8.6

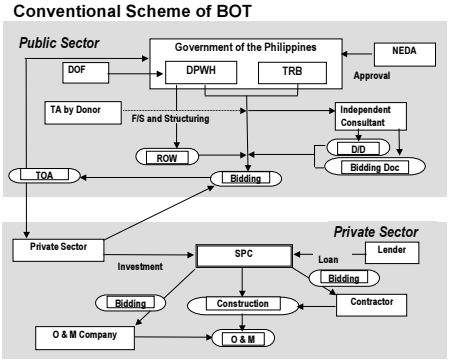
Existing Implementation Schemes

Scheme of Foreign Loan Toll Road Project

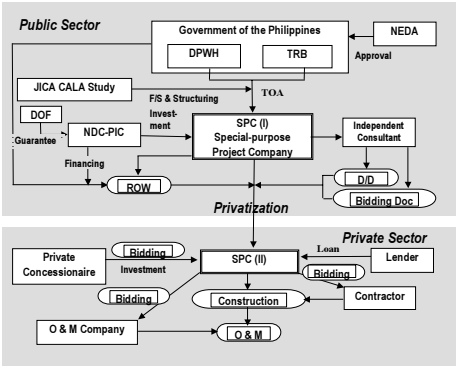


Existing Implementation Schemes

Conventional Scheme of BOT



Exploring New BOT Scheme for CALA Highway Project with NDC-PIC's Participation



Implementation Scenarios

1. Conventional

- **N-S and E-W Roads are implemented in stages, by DPWH, as national open-access, non-toll roads. Financing to come from capital budget of DPWH and donor loan.**
- **DH2 to link Daang Hari to SLEX to depend entirely on PIC/PNCC efforts. Molino Blvd remains an open road, including new section through One Asia.**

2. Possible NDC-PIC Participation

- **N-S Road (NS1, NS2, NS3 and DH2) are built as toll roads by special-purpose project company initially capitalized by NDC, granted a Concession Agreement by TRB, and subsequently transferred via open tender to the private sector.**
- **E-W roads (DH3 and DH4) and rest of NS sections (NS4, NS5, and CE1 to CE3) are implemented by DPWH as national, open-access, non-toll roads with financing from capital budget and donor loan.**

Advantages of NDC-PIC Participation:

- **Early implementation of some sections.**
- **Less outlays from DPWH budgets.**
- **Advance ROW acquisition becomes possible for some other road sections.**

Responsibilities for Implementation

CALA Expressway (non-Toll)

DPWH to lead implementation on conventional public sector financing mode

North-South (NS1-NS3:Tolled)

NDC/PIC to lead implementation via BTO scheme

East-West (DH2: Tolled)

NDC/PIC/PNCC to implement toll road via BTO scheme

Preparatory Activities

PLANNING

- ❑Feasibility Studies
  - Concensus, Endorsements & Resolutions/Ordinances
  - Parcellary mapping (pending approval)
- ❑Detailed Engineering (Design)
  - ROW acquisition details
  - Tender documents
- ❑Line up financing for construction
  - NEDA-ICC approval
  - Loan Appraisal & Negotiation

IMPLEMENTATION

- ❑Bid and Award of construction contracts
- ❑ROW Acquisition
  - Writ of possession
  - Relocation of affected residents
- ❑Construction
  - Relocate utilities, if any
  - Construction supervision
  - QA/QC

Implementation Role of Key Players

NGUs

DPWH:
- Prepare F/S & DE
- Acquire ROW
- Bid-out construction of roads
- Supervise construction
- Maintain completed roads

DENR:
- Review & approve ECC
- Monitor ECC compliance during construction

DOF: negotiates foreign & domestic loan financing

DBM: releases funds per GAA

NHA: executes resettlement program

LGUs

Barangay:
- Endorse road project
- Identifies affected residents & assist in relocation, if any

Municipality/City:
- Resolution endorsing project
- Freeze land use classification and zonal valuation of ROW
- Facilitate ROW acquisition (land titles, suasion on owners, assist in relocation, etc.)
- Supplemental funds for ROW & feeder roads

Province:
- Resolution endorsing the project
- Issue ordinance for ROW protection
- Coordinates support of municipalities along road alignment

Implementation Role of Other Players

For TOLL ROADS

NDC/PIC:
- Provide seed equity for toll project company that will have toll concession
- Advance funds for ROW
- Harness private sector participation in the project company
- Advance funds for pre-construction activities, such as for DE

TRB: grants toll concession

IFC/Lenders: provide long term loans to the project company, to finance construction

TPC: toll project company builds and operates the toll road

For Non-Toll ROADS

Donor/Foreign Lenders:
- Provide long-term concessional loans, to finance road construction
- Oversight of construction to ensure funds are disbursed according to approved plans/programs

Congressmen:
- Lobbies for inclusion in GAA as early as possible
- Allocates CDF for early ROW acquisition and/or relocation of affected constituencies

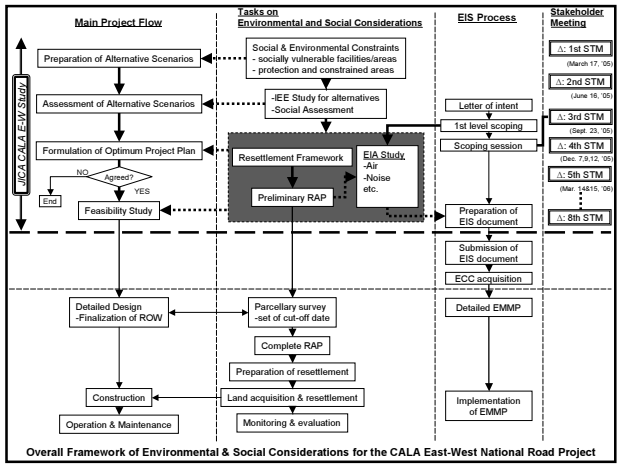
THANK YOU

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

THE FEASIBILITY STUDY AND IMPLEMENTATION SUPPORT ON THE CALA EAST-WEST NATIONAL ROAD PROJECT
5th Stakeholders' Meeting in Cavite

Session 1 :
Environment and Social Considerations (ESC) Study

15 March 2006



Overall Framework of Environmental & Social Considerations for the CALA East-West National Road Project

Stakeholder Meetings

No.	Study Phase	Main Subjects	Period
1st	Preparation of Scenarios	· Study Outline · Past, Ongoing & Future Transport Projects · Scope of Stakeholders, · Schedule & Objectives of Future Stakeholder Meetings	March 17, 2005
2nd	Evaluation of Scenarios	· Alternative Development Scenarios · Environmental Framework:Social and Natural Environment · Alternative Scenarios for Regional Transport Network	June 16, 2005
3rd	Preparation of Optimum Project Plan	· Outline of alternatives · Alternative measure in zero option · Scope and evaluation methodologies for Environmental and Social Considerations Study (EIA level) · Obtain opinion on concerned environmental impacts *(This STM is the Official Scoping Session under EIS Process)*	Sept. 23, 2005
4th		· Results of evaluation on alternatives · Progress and interim results of ESC study (EIA level) · Study framework on preparation of optimum project plan	Dec.7 (Cavite) Dec. 8 (Laguna) Dec.12 (Muntenlupa), 2005
5th		· Results of ESC study (EIA level) · Implementation arrangements of the project · Mutual consent on optimum project	Mar.14 (Laguna) Mar.15 (Cavite), 2006
6th	F/S	· Outline of F/S · Follow-up of ESC study (EIA level) · Explanation of resettlement policy	Mid-May, 2006
7th		· Progress of the F/S · Explanation of framework of RAP	Early July, 2006
8th		· Outline of results of F/S · Mutual consent on framework of RAP · Further arrangement and requirement for the implementation	Early Sept., 2006

Results of the Environmental & Social Considerations Study

- Environmental Baseline Study
  - Field measurement surveys: air, noise/vibration, water
  - Secondary data collection
- Social Survey
  - Focus group discussion (Barangay consultation)
  - Perception survey
    - 700 sampled households from project-affected barangays
  - Household inventory survey for resettlement
    (100% survey for potential households to be resettled for ROW acquisition)
    - Approx. 800 households
- Impact Assessment

Results of Baseline Surveys

ENVIRONMENT AND SOCIAL CONSIDERATION STUDY
Feasibility Study and Implementation Support for the Cavite-Laguna (CALA) East-West National Road Project

Introduction

Presidential Decree No. 1586 (PD 1586), otherwise known as the "Philippine Environmental Policy", is considered the first issuance on Environmental Impact Statement (EIS) system in the Philippines, effective in 1977. PD 1586 requires "all agencies an instrumentalities of the national government, including government-owned and controlled corporations, as well as private corporations, firms and entities to prepare an environmental impact statement for every action, project or undertaking which significantly affects the environment."

Major roads are considered as Environmentally Critical Projects and hence require the preparation of an EIS and secure an Environmental Compliance Certificate (ECC).

ENVIRONMENTAL BASELINE STUDY

Objective

The main objective of the Environmental Baseline Study is to collect environmental baseline information in order to characterize the existing environmental condition of the project area and identify and assess potential impacts on its social and natural environment.

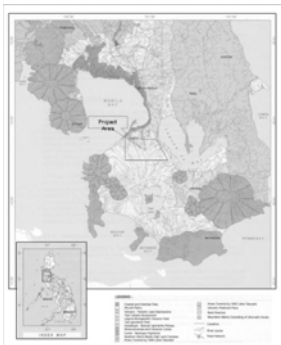
Main Task of the Environmental Baseline Study

1) **Collection and review of existing secondary data**
2) **Field Surveys**
   a) **Air quality sampling**
   b) **Noise and vibration level measurement**
   c) **Water quality sampling**
   d) **Reconnaissance survey on natural conditions**

THE STUDY AREA
PHYSICAL ENVIRONMENT
I . GEOLOGY

Regional Topography and Geomorphology

The project area lies on the northern portion of the Southwest Luzon Uplands. The regional landscape is characterized by Gently sloping to rugged mountainous terrain abutting to a wide Central plain area marked by freshwater lakes (Laguna Lake and Taal lake). The project area is situated on slightly elevated Sloping region on the northern portion of the Taal Ignibrite Field, a sequence of Quaternary pyroclastic deposits and east of the Coastal areas of Cavite.



Regional Geology

The Laguna volcanic plain was created by the volcanic activities that formed the Taal Volcano and neighboring volcanic vents. The volcanoclastic rocks underlying the project area appear to have been expelled mostly from Taal Volcano. The active volcanism provided for the large volume and thick accumulation of volcanic ejectamenta or pyroclasts at sites of deposition at a distance from the volcano source.

The volcanic materials were later eroded and transported by surface water to lower areas where they underwent some sorting that resulted in occasional beds of well-sorted tuffaceous sands and gravel.

Regional Geology

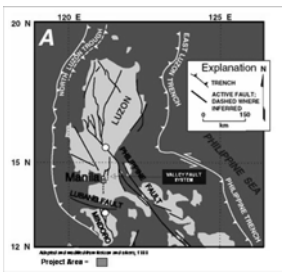
The Laguna volcanic plain is bounded to the west by a fault, known as the West Valley Fault (WVF), that trends north-south from Muntalan to Tagaytay Ridge and traverses west of Carmona. The trace of the fault from Muntinlupa area and about 5kms west of the Project Site is generally not very clear, ut the abrupt ascent of the land (Carmona area) towards Tagaytay suggests the presence of the fault. The eastern block of WVF moved downward relative to the western block

Regional Tectonic Setting

Luzon Island is situated at the western margin of the Circum-Pacific region, centered roughly at 15ºN latitude and 121ºE longitude. The region is characterized y an active convergence between the Eurasian and Pacific plates.

Two active subduction systems of opposing polarity border Luzon: the eastward-dipping Manila trench on the west, and the incipient, northward-propagating, westward-dipping east Luzon trench, on the east.

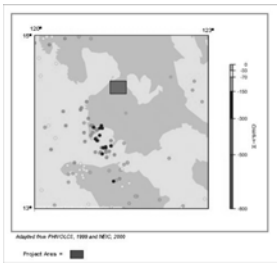
At the Laguna and Cavite sector, volcanic rocks show marked difference in chemical composition from typical arc-related calc-alkaline volcanics. A NE-SW trending “rift” structure – referred to as the Macolod Corridor was proposed to account for this geochemical variation.



Regional Seismicity

Earthquake events tend to cluster in the offshore region along the Verde Island Passage between the southeast coast of Batangas and Mindoro Island. Moderate to deep (> 150 kms) foci seismic events with a predominant thrust focal mechanism solution indicate active convergence along the southern extension of the Manila Trench system. In contrast, shallow seismic events (<70kms) appear to have originated from th movements of regional faults (e.g. Mindoro Fault, Lubang Fault) and their minor splays.

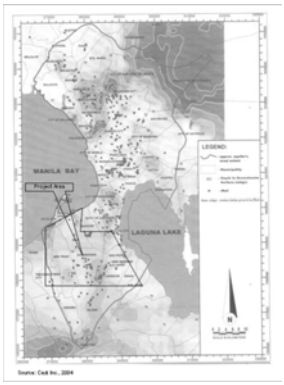
A single event located within Taal Lake is of volcanic origin associated with the 1965 eruption of Taal Volcano.



THE STUDY AREA
PHYSICAL ENVIRONMENT
II . HYDROGEOLOGY

Hydrogeologic Units

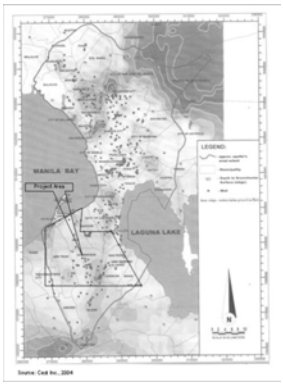
- **Quaternary Volcanic Sediments**
  The Quaternary volcanic sediments form the main host of the underlying aquifers of the project area. It consists of layers of tuffaceous pebbly sandstone or tuff, which are all capable of storing and transmitting large quantities of groundwater. Known production yields are almost about 20 liters per second (lps) but as high as 60 lps I some areas. The aquifers are under confined to semi-confined conditions.



II . HYDROGEOLOGY

Hydrogeologic Units

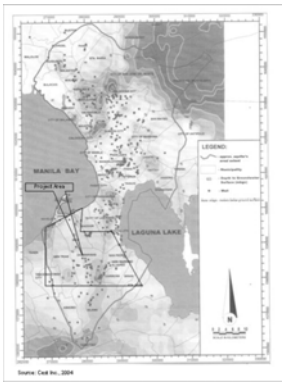
- **Quaternary Alluvium**
  The Quaternary alluvium are recent unconsolidated alluvial deposits that consists of clay, silt, sand and gravel along coastal areas, river beds and floodplains. Alluvial deposit acquifers in coastal areas are restricted by sea water intrusion while inland aquifers are restricted by low storage due to limited aquifer area and/or thickness. Well yields are mostly about 2 lps but as high as 20 lps in some areas. Shallow acquifers are under unconfined conditions.



II . HYDROGEOLOGY

Groundwater Levels

Groundwater depths at the project area ranges from 60 meters below ground surface (mbgs.) to 100 mbgs.

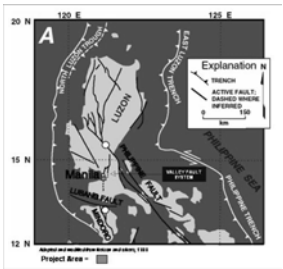


THE STUDY AREA
PHYSICAL ENVIRONMENT
III . NATURAL HAZARDS

Seismic Hazards

Of the known major tectonic structures in the region, the nearest earthquake generator to the project site is the extension of the West Valley Fault (WVF).

A paleoseismic study (Nelson and others, 2000) suggests that the northern part of this fault has a recurrence interval of 200-400 years for magnitude 6-7 earthquakes on the fault for an annual probability rate of 0.5% to 0.25%.



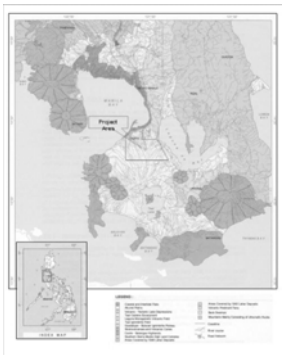
III . NATURAL HAZARDS

Volcanic Hazards

The nearest active volcano within the vicinity of the Project area is Taal Volcano. Eruption-related volcanic hazards for Taal volcano would include airfall tephra, base surge, fissuring and ground subsidence, seiches/tsunami and flooding.

Considering the more than 25-km distance of the Project Site to Taal Volcano, it is unlikely that the area will be directly and adversely affected by eruption-related volcanic hazards from the volcano.

At most the area may be affected by minial ash fall if wind speed and direction were favorably directed towards its location.



III . NATURAL HAZARDS

Foundation Hazards

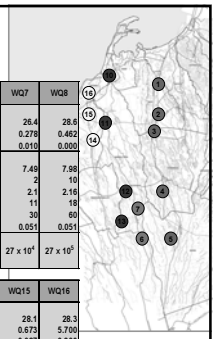
Paleosol horizons are known to occur in the pyroclastics at the project area. With contrasting textural types of the under lying foundation, the area is susceptible to differential settlement or long-term settlement.

The damage attributable to settlement can range from complete failure of the structure to slight disfigurement.

Settlement can be reduced:

•if the site is preloaded or surcharged prior to construction, or
•if the soil is subjected to dynamic compaction or vibrocompaction.

IV . WATER QUALITY



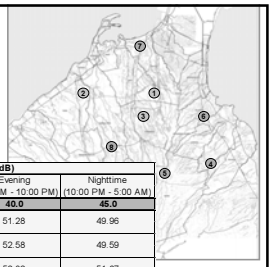
PARAMETERS	DENR Standards	WQ1	WQ2	WQ3	WQ4	WQ5	WQ6	WQ7	WQ8
Physical Characteristics									
Temperature	-	28.8	26.1	27.7	26.0	25.0	25.4	26.4	28.6
Conductivity (ms/cm)	-	0.244	0.230	0.238	0.247	0.982	0.205	0.278	0.462
Salinity (ppm)	-	0.000	0.000	0.000	0.010	0.047	0.000	0.010	0.000
Chemical Characteristics									
pH	6.5 - 9.0	8.21	7.66	8.37	7.36	8.27	7.12	7.49	7.98
BOD	7(10)mg/L	3	2	3	7	10	12	2	10
DO	5.0 mg/L	3.08	2.09	3.08	2.18	3	2.13	2.1	2.16
Turbidity	NTU	21	12	20	15	20	17	11	18
TSS	60 mg/L inc.	20	60	20	40	70	60	30	60
Lead	0.05 gm/L		0.145		0.067		0.102	0.051	0.051
Biological Characteristics									
Total coliform	5,000 MPN/100mL		12×10^6		22×10^4		34×10^6	27×10^4	27×10^5

PARAMETERS	DENR Standards	WQ9	WQ10	WQ11	WQ12	WQ13	WQ14	WQ15	WQ16
Physical Characteristics									
Temperature	-	27.5	26.5	27.8	26.9	27.2	28.5	28.1	28.3
Conductivity (ms/cm)	-	0.278	21.600	0.612	0.307	0.500	0.223	0.673	5.700
Salinity (ppm)	-	0.010	1.297	0.027	0.017	0.027	0.000	0.027	0.300
Chemical Characteristics									
pH	6.5 - 9.0	7.63	8.10	8.50	8.23	8.31	7.65	8.40	7.39
BOD	7(10)mg/L	7	6	14	3	9	5	5	9
DO	5.0 mg/L	2.1	2.96	2.97	11	2.99	2.18	3.07	2.11
Turbidity	NTU	11	24	15	32	15	15	19	20
TSS	60 mg/L inc.	60	20	50	20	20	30	20	40
Lead	0.05 gm/L	0.067		0.102	0.051				
Biological Characteristics									
Total coliform	5,000 MPN/100mL	8×10^6					9×10^5		3×10^6

V . AIR QUALITY

PARAMETERS	DENR Standards	AQ1	AQ2	AQ3	AQ4	AQ5	AQ6	AQ7	AQ8
Total Suspended Prticulates (TSP)	230 ug/Nmc	87	65	63	44	139	252	364	329
Sulfur Dioxide (SO_2)	180 ug/Ncm	37	42	22	22	56	77	105	83
Nitrogen Dioxide (NO_2)	150 ug/Ncm	44	56	31	31	28	22	38	41
Carbon Oxide (CO)	35 ug/Ncm	-	-	-	ND	ND	ND	ND	1.0
Ozone (O_3)	140 ug/Ncm	55	22	88	5	18	87	55	32
Lead (Pb)	1.50 ug/Ncm	0.022	0.043	0.009	0.021	0.161	0.387	0.433	0.322
SPM	-	35	29	31	19	113	212	289	267
NO	-	29	34	17	21	17	14	23	26

VI . NOISE LEVEL



AREA CLASSIFICATION (Based on dominant land use)	Average Noise (dB)			
	Morning (5:00 AM - 9:00 AM)	Daytime (9:00 AM - 6:00 PM)	Evening (6:00 PM - 10:00 PM)	Nighttime (10:00 PM - 5:00 AM)
Class A-residential purposes	**40.0**	**55.0**	**40.0**	**45.0**
NL-1 Brgy. Pasong Buaya, Imus, Cavite	55.2	61.12	51.28	49.96
NL-2 Brgy. Tapia, Gen. Trias, Cavite	52.38	55.08	52.58	49.59
NL-3 Morzon Subd., Burol Main, Dasmarinas, Cavite	55.68	53.94	52.82	51.67
Class B-commercial areas	**60.0**	**65.0**	**60.0**	**55.0**
NL-4 R.C. Sta. Rosa Centro, Sta. Rosa, Laguna	52.14	52.33	51.9	50.81
NL-5 Brgy. Biga I, Silang, Cavite (Aguinaldo Hway)	55.78	56.18	55.9	52.49
NL-6 Brgy. San Antonio, San Pedro, Laguna	72.6	73.0	67.7	61.5
NL-7 Brgy. Panapaan, Int. Aguinaldo Hway/Tirona Hway	75.7	73.7	70.2	66.4
NL-8 Brgy. Manggahan, Int. Governor's Drive/Gen Trias-Indang Road	76.5	79.6	77.9	68.0

Results of Social Surveys

List of Affected Barangays
(N/S: 17 bgys, E/W: 16 bgys, Cavite Expressway: 14 bgys)

Province	Municipality	Barangay	Number of Barangay
		N/S Road	
Cavite	Bacoor	Mambog III, Mambog IV, Talaba II, Talaba III, Talaba VII, Zapote V	6
	Dasmariñas	Burol Main, Salitran I, Salitran II, Salitran III, Salitran IV, San Augustin I, San Augustin II, Langkaan I*	8
	Imus	Anabu I-G, Pasong Buaya I*, Buhay na Tubig	3
		Total for N/S Road	17
		E/W Road	
Cavite	Bacoor	Molino IV	1
	General Trias	Pasong Camachile I, Pinagtipunab, Tapia	3
	Imus	Anabu II-D, Anabu II-E, Malagasang II-C, Pasong Buaya I*, Pasong Buaya II	5
	Tanza	Amaya I, Biga, Sanja Mayor, Santol, Bunga	5
Metro Manila	Muntinlupa city	Tunasan, Poblacion	2
		Total for E/W Road	16
		Cavite Expressway	
Cavite	Dasmariñas	Langkaan I*	1
	General Trias	San Francisco	1
	Silang	Batas, Biluso, Carmen, Biga I, Malaking Tatiano, Iba, Munting Ilog, Sabutan, Tibig	9
Laguna	Santa Rosa	Don Jose, Sto. Domingo, Malitlit	3
		Total for Cavite Expressway	14
		Total Barangays	**45**

Total of Cavite: 38 bgys, Laguna: 3 bgys, Metro Manila: 2 bgys

Note: *- N/S and E/W roads intersect in the Pasong Buaya I.
N/S road and Cavite expressway intersect in the Langkaan I.

Socio-Economic Characteristics of the Affected Barangays
(Population of Directly Affected Barangays)

Province	Municipality	Barangay	Population	Number of Households
Cavite	Bacoor	Mambog III, Mambog IV, Talaba II, Talaba III, Talaba VII, Zapote V, Molino IV	37,972	8,121
	Dasmariñas	Burol Main, Salitran I, Salitran II, Salitran III, Salitran IV, San Augustin I, San Augustin II, Langkaan I	48,919	10,933
	Imus	Anabu I-G, Pasong Buaya I, Buhay na Tubig, Anabu II-D, Anabu II-E, Malagasang II-C, Pasong Buaya II	23,519	5,066
	General Trias	Pasong Camachile I, Pinagtipunan, Tapia, San Francisco	34,854	7,360
	Tanza	Amaya I, Biga, Sanja Mayor, Santol, Bunga	16,178	3,513
	Silang	Batas, Biluso, Carmen, Biga I, Malaking Tatiano, Iba, Munting Ilog, Sabutan, Tibig	22,777	4,729
Laguna	Santa Rosa City	Don Jose, Sto. Domingo, Malitlit	21,520	4,701
Metro Manila	Muntinlupa city	Tunasan, Poblacion	87,391	18,468
		Total	293,130	62,891

Focus Group Discussion
(Barangay Consultation)

- **Agenda**
  -Outline of the proposed projects,
  -Proposed alternative road alignments,
  -Coordination on social surveys,
  -Q&A (discussion)
- **Participants**
  -Barangay captains and councilors,
  -Project-affected persons, Residents,
  -Peoples organizations (PO),
  -Non-governmental organizations (NGO)
- **Resolutions by Barangay for acceptance of the project**
  =>Issue of Resolutions for endorsement of the acceptance of the Project by Municipalities and Provinces

Focus Group Discussion
(Barangay Consultation)

Issues & Concern

- Is the alignment final?
- Will there be compensation for affected assets? When?
- Is there a ready relocation site?
- How will existing business establishment be compensated?
- Will there be alternative income source in the relocation site?
- What documents are needed as proof of ownership?

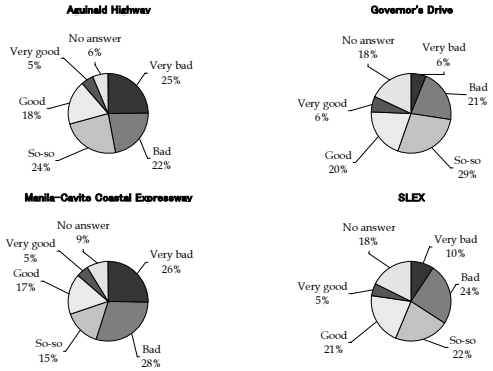
Results of the Perception Survey

- Perception Survey
  - 700 sampled households from project-affected barangays
    (Indirect affected households from the ROW acquisition)

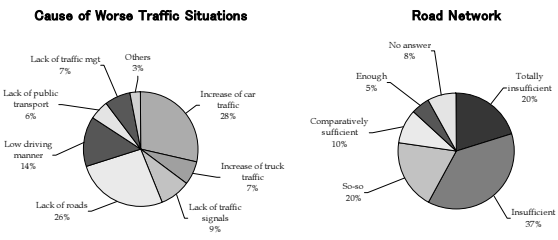
+

- Household inventory survey for resettlement
  - 800 households to be potentially resettled
    (Direct affected households from the ROW acquisition)

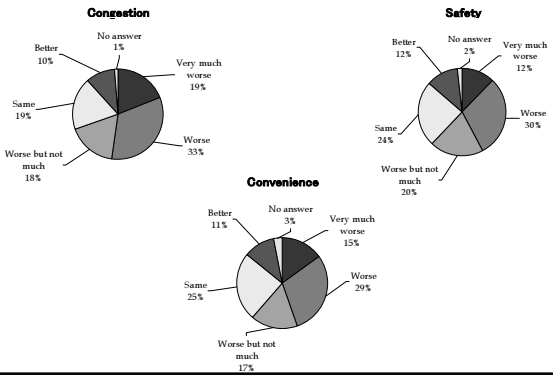
Results of the Perception Survey
(Impression on present road conditions)



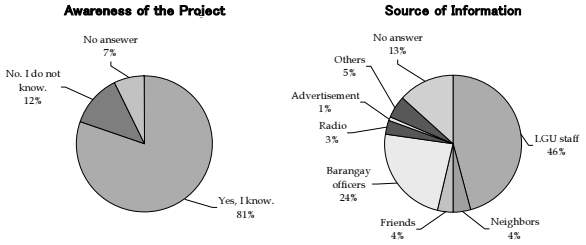
Results of the Perception Survey
(Impression on present road conditions)



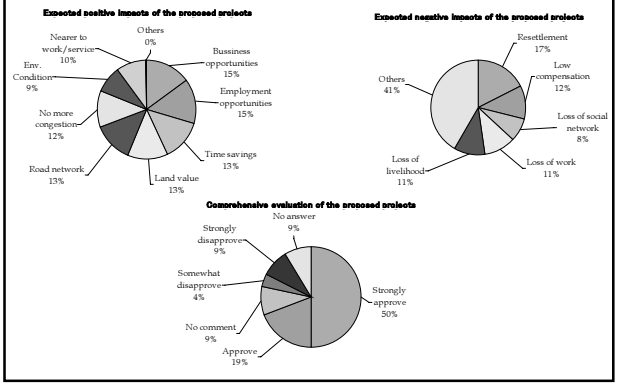
Results of the Perception Survey
(Impression on present road conditions: Comparison to past situation)



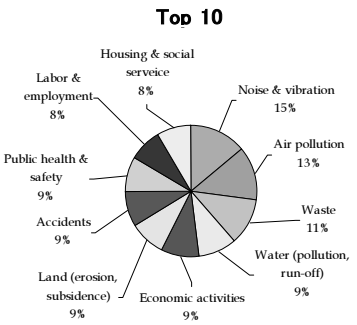
Results of the Perception Survey
(Awareness of the proposed projects)



Results of the Perception Survey
(Intention on implementation of the proposed projects)



Results of the Perception Survey
(Social and environmental concerns on the proposed projects)



Results of the Social Survey
(Household Interview Survey for Resettlement)

- **All potential households to be resettled: approx. 800 HHs (all alternative alignments)**
- Survey method
  1. Direct interview of households to be potentially relocated (Incl. questions on perception of the project)
  2. Assigning of survey control number to the housing units
  3. Location/marking of interviewed households on community spot map
  4. Photo record of the housing unit

- **Main Items of the Inventory**
  - **Residential condition**
    - **Lot size, floor area, duration of occupancy, housing type, housing materials/appearance, tenure status/land status, household income**
  - **Intention of the resettlement**
    - **Acceptability and preferred relocation site**

Affected Households on Selected Alignment

MUNICIPALITY	BARANGAY	PROPOSED ROAD	HOUSEHOLD INVENTORY
Bacoor	Mambog III	N / S	1
	Talaba II	N / S	95
	Talaba III	N / S	67
	Talaba VII	N / S	31
	Zapote V	N / S	151
		Sub-total	345
Dasmariñas	Burol Main	N / S	20
	Salitran I	N / S	13
	Salitran II	N / S	5
	San Agustin I	N / S	175
	San Agustin II	N / S	16
		Sub-total	229