VIII. INTERPRETATION OF RESULTS OF COST-BENEFIT, PROFITABILITY AND EFFICIENCY ANALYSES

This chapter presents the results of the cost-benefit evaluation performed by the JICA Survey Team, for the project.

The construction of the San Miguel Trunk Road and the expansion of the part of the CA-1 Highway aim at mitigating the current and future traffic and congestion in the entry and surrounding areas of the city of San Miguel. The improvement of the roads will stimulate economic and social activities in the city. At the same time, the Trunk Road is projected in the important CA-1 highway that connects the biggest international maritime port of the country (Port of La Union) with San Salvador, the capital city. Consequently, the Project will not only contribute to reducing the traffic and congestion of the city, but it will also promote the creation of a corridor without logistics problems to the west and east of the entire country, and finally, it will promote sustainable economic development in El Salvador.

Nonetheless, the Project requires high investment costs of a limited government Budget. Under this situation, it is necessary to review if the application of the Project is or not justified from the point of the national economy perspective, by comparing the Project costs with the economic benefits of the same.

The bases for the economic evaluation are the result of the traffic demand forecast, available data to estimate the Project economic benefits and costs. .

VIII. 1 PROJECT DEFINITION TO BE EVALUATED

For the economic evaluation two alternatives were analyzed and compared:

Alternative 1: Construction of the Trunk Road of San Miguel from the starting point to the CA-1 Highway (to La Unión)

- Alternative 2: Construction of the Trunk Road of San Miguel from the starting point to the road RN17S (Highway to El Delirio).

Basically the difference of the two alternatives is that the Trunk Road expansion between CAI to La Union to RN17S is not included (alternative 1) or is included (Alternative 2).

VIII.2 Project Benefits

VIII.2.1 *Quantified Economic Benefits*

In this evaluation there are two types of direct benefits that were estimated from a quantitative perspective:

1. Costs savings of the vehicle operation (COV)
2. Cost savings in passengers'' travel time the (CTV)

The benefit of reducing the number of accidents was not calculated due to the lack of necessary information on the cost and the number of accidents per vehicle –km by type of accident (deaths, injuries, and damage to property).

VIII.2.2 *Method of comparison "with or without the project"*

The economic benefits were estimated based on the comparison method "with or without Project". In the case of "with Project" makes that the San Miguel Trunk Road is built and that the CA-1 highway (Section 1, from the intersection of Moncagua to the starting point of the Trunk Road) is expanded in width.

In the case of "without project" means that the Project will not be implemented and the situation of the network continues the same. The economic benefits were quantified as the savings in COV and CTV derived from the difference in the total costs COV and CTV between the cases of "without Project" and "with Project".

VIII.2.3 *Quantification of the Project benefits*

VIII.2.3.1 Vehicle operation costs (COV)

- *Basic Data and Sources*

The last basic data on COV is available on the report on the Usulutan Trunk Road feasibility. Since the data presented in the COV in the Usulutan Trunk Road were the prices for 2005, a new economic updating was made to update the prices to 2011 (October 2011), basically adopting the same method used in the previous study.

- COV c*omponents and vehicle classification*

The COV comprises the following components:

1) Fuel costs
2) Other non-fuel costs
- Oil
- Tires - Depreciation cost
- Maintenance (parts and labor)
- General expenses for company vehicles (*)

(*) The study on the Usulutan Trunk Road does not include the components of the general expenses.

The COV have been calculated for the following 6 types of vehicles, according to the classification of the traffic demand foreseen: (the COV of the motorcycles was not calculated given that there is no information available) Car, pick-up truck, Minibus, Bus, Truck, and Trailer.

Market prices (as of October 2011) for fuel, lubricants, tires and vehicles were collected using as reference the information from the manufacturers and distributers in El Salvador.

- *Fuel Cost*

The fuel cost of gasoline and diesel in prices of 2011 are the following: Regular Gasoline = $ 3.75 per gallon = (0,991 dollars per liter) Diesel = 3,93 dollars per gallon = (1,038 dollars per liter)

The fuel consumption rates (liters /km) are given as variables that depend on the speed and the coefficient fuel consumption rates / speed, which is shown in the following formula:

$$L = a + bV + cV2 + dV3$$

Where:

- L: fuel consumption rate (liters / km)
  V: Average velocity (km / h)
- a, b, d, c: constant parameters compared with the fuel consumption

- *Other non-fuel costs*

As the oil consumption is independent from the speed, the petrol consumption costs ($ / km) are presented as constant values. Given the lack of information provided by the Usulutan Trunk Road Study on the consumption rates (liters / km), the parameters are inflated using the Consumer Price Index of 2005 to 2011.

b) Tire costs

The cost of the tires is also independent from speed. Applying the IPC of 2005, the costs of tires in 2011 were updated to 2011.

c) Vehicles depreciation cost

The cost of vehicle depreciation is a kind of capital cost and it is divided in two parts, one related with the distance and the other related with time. In this evaluation, it is assumed that the percentage of the amortization expenses related with the distance and time related are 50% of the amortization total cost, respectively

d) Maintenance Cost

The maintenance cost is classified into two categories, the costs of spare parts and labor. Given the lack of detailed information in the Usulutan Trunk Road Study, the spare part costs have been updated by applying the consumer price index from 2005 to 2011. Although the Usulutan Trunk Road Study established the cost of labor for the maintenance of the distance, the costs related to ($ / km), the labor cost was addressed as the time related cost in this study and $ 2.5 / hour supposedly applies to all types of vehicles.

e) General expenses for commercial vehicles

The general expenses are necessary for the daily operations of the commercial vehicles and the maintenance of the administrative activities of the transportation companies. The cost does not vary depending on the operations distance and the annual fixed cost (for example, the registration rate of the vehicles / insurance taxes, insurances and the power in the company's offices, for example). In this evaluation, 10% of the annual depreciation costs were assumed by the annual general expenses.

(5) Total velocity COV

The added COV components and the coefficient speed /COV unit ($ / km) was also estimated.

VIII.2.3.2 Cost of travel time (CTV)

CTV savings per passenger is another important component of the economic benefits of the road projects. The value per time unit (VOT: $ / hour / vehicle) by type of vehicle in general comes from the income, the salaries and profits of the passengers.

The Usulutan Trunk Road Study presented the methodology applied by the Salvadoran Foundation of Economic and Social Development (FUSADES) that was the methodology originally used by the Central American Transportation Study (ECAT), and referred to the data by GDP by Central Reserve Bank of El Salvador and the Multiple Purpose Household Survey of the Ministry of Economy.

Based on the prior information, the average values of passenger time (VOT) for cars and buses in 2005 were calculated. The average value of the passengers times is estimated in 1,15 $ / person / hour in 2005. In order to prove the validity of the time value before 2005, the per capita GDP at 2005 prices is referred and this was compared in the following manner:

- The per capita GDP in2005 current prices= 2,845.6 ($ / person) *
  The work hours in one year = 2,500 hours (8 hours / day x 26 days / month x 12 months)

- 1,14 $ / person / hour (= 2,845.6 $ person / 2500 hour of work)
  (* Source: Central Reserve Bank of El Salvador)

Therefore, the time value of the passengers in 2005 estimated based on the per capita GDP is almost equal to the time value (for working purposes) for the Usulutan Trunk Road Study.

The next step was to estimate the values of passengers time in 2011 (base year for this evaluation) Applying the per capita GDP and until 2011 (at current prices), the passengers values, the time of the cars and buses are calculated as shown in the following table.

The value of time of each passenger per work travel:

TABLE No. VIII.I. VALUE OF TIME TO COMMUTE TO WORK PER PASSENGER

Year	The value of time of passengers: Car	The value of time of passengers: Bus	Average for each trip	Per Capita GDP (current prices)
2000	1.78($/pax/hr) (=3.78/2.12)	1.37($/pax/hr) (=18.01/13.19)	0.99($/p/hr)	
2005	2.05($/pax/hr) (=1.78x1.14/0.99)	1.57($/pax/hr) (=1.37x1.14/0.99)	1.14 (GDP base)	2845.6 ($ / person)
2011	271. ($/pax/hr) (=2.05x3765.0/2845.6)	2.08($/pax/hr) (=1.57 x 3765.0/2845.6)		3,765.0($/person)*

Source: JICA Survey Team

As shown in the previous table, the time values of the passengers for a working travel in 2011 per car is estimated in $ 2,71 / person / hour for conventional sedans and 2,08 dollars / persons / hour for a bus passenger. Based on the results, and assuming that the value of time for a non-work travel (30% of the working travel was assumed in this evaluation), applying the composition for the purpose of the travel, and the average occupancy per type of vehicle (average number of passengers per vehicle), the time per vehicle was calculated for2011.

VIII.2.4 *Estimated economic benefits*

The economic benefits (savings of COV and CTV) were calculated by applying the COV unit values of CTV and the values of the CTV to the results of forecasts of traffic demand.

The calculation formula are the following:

$$VOC(B) = \sum_{n} \sum_{m} [(Q_{w/o})_{n,m} * (L^{m}) * (UVOC_{nm,r})] - \sum_{n} \sum_{m} [(Q_{with})_{n,m} * (L^{m}) * (UVOC_{nm,r})]$$

$$\text{Time (B)} = = \sum_{n} \sum_{m} [(Q_{w/o})_{n,m} * TIM(WO)_{m} * TV_{n}] - \sum_{n} \sum_{m} [(Q_{with})_{n,m} * TIM(WITH)_{m} * TV_{n}]$$

Where:

VOC (B)	Benefit of the total COV savings
$(Q_{w/o})_{n,m}$	Traffic volume by type of vehicle (n), in a road (m) without project
L^{m}	Length of the street (m)
$UVOC_{nm,r}$	Type of vehicle (n) COV Unit at medium speed (V) in road (m) Volume of
$(Q_{with})_{n,m}$	traffic by type of vehicle(n), in road (m) with project total benefit in time
Time (B)	savings travel time in road (m) without project
$TIM(WO)_{m}$	
$TIM(WITH)_{m}$	Travel time in road (m) with project Value of time
TV_{n}	travel per vehicle type (n)

The estimates of the economic benefits of the project for both alternatives are shown in the following tables .

TABLE No. VIII.2. TABLE OF ESTIMATED ECONOMIC BENEFITS (Alternative 1), MILLION US$/ YEAR

Year	VOC and CPT	Without the project (A)	With the project (B)	Benefit (A)-(B)
2015	VOC	286.78	278.14	**8.64**
		99.14	94.83	4.30
	CPT	**385.91**	**372.97**	**12.95**
2020	VOC	344.53	332.28	12.25
	and	136.30	128.73	7.57
	CPT	**480.82**	**461.00**	**19.82**
2025	VOC	413.80	400.35	13.45
	and	188.08	177.56	10.52
	CPT	**601.88**	**577.91**	**23.97**
2035	VOC	610.92	595.81	15.11
	and	377.29	350.87	17.42
	CPT	**988.21**	**955.69**	**32.53**

Source: JICA Survey Team

TABLE No. VIII.3. TABLE OF ESTIMATED ECONOMIC BENEFITS (ALTERNATIVE

2) MILLION OF US$/year

Year	VOC and CPT	Without the project (A)	With the project (B)	Benefit (A)-(B)
2015	VOC	286.78	277.75	9.03
	and	99.14	94.61	4.53
	CPT	**385.91**	**372.36**	**13.56**
2020	VOC	344.53	331.80	12.73
	and	136.30	128.63	7.67
	CPT	**480.82**	**460.42**	**20.40**
2025	VOC	413.80	399.88	13.92
	and	188.08	177.35	10.73
	CPT	**601.88**	**577.22**	**24.66**
2035	VOC	610.92	596.19	14.73
	and	377.29	360.97	16.32
	CPT	**988.21**	**957.16**	**31.05**

Source: JICA Survey Team

VIII.3 PROJECT COSTS

VIII.3.1 *Project economic cost estimation*

VIII.3.1.1 Economic investment costs

The Project investment costs consist of the construction (civil Works), land acquisition and compensation, consultancy services, and physical contingency costs. The economic costs were obtained through the deduction of travel expenses, such as imports duties and the taxes of the financial costs at market prices. In this evaluation, an O.85 factor is applied to convert the financial costs into economic costs, taking into account the tax portion of the added value tax (IVA).

VIII.3.1.2 Economic maintenance cost

Maintenance costs consist of the annual routine maintenance costs and the periodical maintenance costs at 5-years intervals, starting after the construction and opening to the traffic. These costs were also converted into economic costs.

VIII.3.1.3 General

The Project cost was estimated by applying the results of the preliminary engineering designs and the civil Works amounts. Some costs such as Engineering fees, the cost of land acquisition, resettlement costs, the environmental measures, relocation of utilities and the maintenance costs were calculated individually, based on the preliminary design.

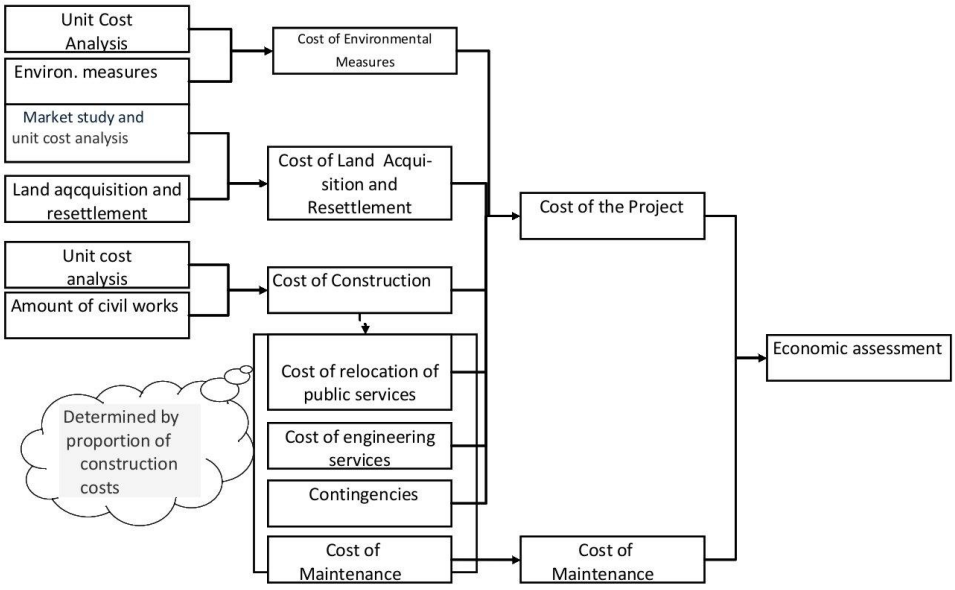
The following premises are taken into account for the project cost estimation.

a) All Works will be implemented by a private contractor or contractors

b) The unit costs were determined based on the prevailing economic conditions in 2011

c) The cost of the engineering services that consist of 1) detailed design and bidding process and 2) the supervision of the construction, estimated in 4% and 8% of the construction cost respectively
d) The acquisition of land and resettlement costs were estimated based on the Price market study conducted and the resettlement costs were estimated based on the price market study conducted and which is described in the PAR.
e) The physical contingency is estimated in 5% of the total construction costs
f) The currency used is USD which is the legal currency in El Salvador, and rate of Exchange of $ EE.UU. 1 = 76,63 JPY is used when the equivalent values are indicated
g) 13% of the added value tax (IVA) is included

In summary, the structure of the Project cost is composed of the elements shown in the Figure.



Source: JICA Survey Team

Figure No. VIII.l. Cost estimation process

VIII.3.2 *Civil Works Cost estimation method*

VIII.3.2.1 <u>Road construction cost</u>

The costs of the road construction were estimated on the base of the Works calculated by type of work in the preliminary design. The unit prices were established by the type of element that was decided by the unit price comparison of similar projects the VMOP recently executed. Unit prices that were established after this study were as from November 2011.

- *Bridge construction costs*

The cost estimate for the bridge construction was made based on the unit Price per square meter (m^2), calculated based on similar projects.

- *Administration*

8% has been estimated for overhead or indirect construction costs. It varies from zero to 25% according to existing contracts, a lower percentage of indirect for larger contracts, and a higher percentage for the smaller ones. If the Project is divided into small contracts, the percentage of overhead can vary and it is possible that the total Project cost will increase as a result of the balance of cost reduction due to the participation of small contractors.

VIII.3.2.2 Construction cost

Based on the amount of calculated work, the construction cost was estimated for the entire Project. The following table shows the summary of construction costs. A 5% increase is taken into account for physical contingency.

TABLE No. VIII.4. SUMMARY OF ESTIMATED COST OF CONSTRUCTION - PRICE IN 2011

ITEM	ALTERNATIVE 1	ALTERNATIVE 2
Length (km)	21.873	25.022
1. General	521,133.42	589,818.78
2. Earth Works	20,555,531.18	20,579,135.18
3. Pavement	13,666,426.20	14,755,748.86
4. Minor drainage works	3,604,214.83	3,604,214.83
5. Larger structures	24,937,618.24	108,369,268.08
6. Protection Works	9,888,172.93	10, 057, 840.92
7. Incidental Works	3,050,843.48	3,609,268.08
8. Utility Relocation Service	102,777.66	102, 895. 68
Total Direct Cost	76,326,717.94	161, 659, 788.69
Overhead	6,106,137.44	12, 932, 783.10
VAT (VAT) (13%)	10,716,271.20	22, 697, 034.33
Total Cost of Construction	**93,149,126.58**	**197,289,606.12**
Cost per kilometer	4,258,635.15	7,884,645.76

VIII.3.2.3 Land Acquisition and Resettlement Costs

A range of prices for land acquisition was calculated based on the results of the market study for housing and land near the Project. Other resettlement and compensation costs were calculated on the base of the unit cost analysis and in an empirical manner.

The cost for the resettlement was estimated according to the preliminary design results that determine the area to be acquired and the number of constructions to be relocated.

TABLE No. VIII.5. COST OF LAND ACQUISITION AND RESETTLEMENT

ITEM	COST (US$)
Land Acquisition (Max.) Cost	5,568,698.85
Compensation for buildings	1,736,911.08
Cost of Resettlement (land and building) for 4 families	30,258.35
total	7,335,868.28
Approx.	(7,400,000)

Source: JICA Survey Team

VIII.3.2.4 Environmental Management Cost

According to the environmental impact assessment (EIA), results, the different types of measures to mitigate the negative impact that will be generated by the Project are suggested. Some of the mitigation works, such as the protection of slopes by cut-offs and embankments, draining works, dust and noise control during the construction, etc., are included in the construction costs whether explicitly or implicitly. The tasks shall be carried separately from the construction works contract, they are included in the environment management costs, estimated by650,000.

VIII.3.2.5 Maintenance

The cost of road maintenance has been estimated based on the assumption that there is routine and periodic maintenance. It has been considered that the periodic maintenance is done every 5 years, and the routine maintenance is on-going. For the routine maintenance, from the 0,5% of the construction cost per year is considered for the first and second year, and 0,75% for the third and fourth year, whether since the construction or the periodical maintenance that includes the superposition of asphalt covering. From *2% to* 5% of the construction cost is considered for periodic maintenance. Supposedly the periodic maintenance cost includes the routine maintenance cost for these years periodic maintenance has been projected. The table shows the percentage considered by year, the type of maintenance and the cost per year.

TABLE No. VIII.6 MAINTENANCE COST

Year	Cost of Construction	Routine		Periodic	
	USD 93,149,126.59	%	Cost in USD	%	Cost in USD
1		0.50%	465,745.63		
2		0.50%	465,745.63		
3		0.75%	698,618.45		
4		0.75%	698,618.45		
5				2.00%	1,862,982.53
6		0.50%	465,745.63		
7		0.50%	465,745.63		
8		0.75%	698,618.45		
9		0.75%	698,618.45		
10				3.00%	2,794,473.80
11		0.50%	465,745.63		
12		0.50%	465,745.63		
13		0.75%	698,618.45		
14		0.75%	698,618.45		
15				4.00%	3,725,965.06
16		0.50%	465,745.63		
17		0.50%	465,745.63		
18		0.75%	698,618.45		
19		0.75%	698,618.45		
20				5.00%	4,657,456.33
sub. total			9,314,913		13,040,878
Total	USD 22,355,790				

Source: JICA Survey Team

VIII.3.2.6 Engineering services

For the detailed design and bidding process phases of the construction, 4% and 8% of the construction cost have been considered for engineering services. The following table shows the summary of the technical service costs.

TABLE No. VIII.7.ENGINEERING SERVICE COSTS

ITEM	Unit	ALTERNATIVE 1	ALTERNATIVE 2
Total construction cost	**USD**	93,149,126.58	197,289,606.12
Detailed design and tender for assistance	**USD**	3, 725,965.06	7,891,584.24
Supervision of construction	**USD**	7,451,930.13	15,783,168.49

Source: JICA Survey Team

VIII.3.3 *Project cost*

From the above mentioned costs, by category, the total Project cost is summarized as shown in Table 9.3.6.

TABLE No. VIII.8. TOTAL PROJECT COST

ITEM	ALTERNATIVE 1	ALTERNATIVE 2
Length	21.873	25,022
Total Cost of Construction	93,149,126.58	197,289,606.12
Cost per Kilometer	4,258,635.15	7,884,645.76
Contingency (5%)	4,657,456.33	9,864,480.31
(Engineering Service)		
Detailed Design and Tender for Assistance	3,725,965.06	7,891,584.24
Supervision of Construction (4%)	7,451,930.13	15,783,168.49
(Other Costs)		
Environmental Management	650,000.00	650,000.00
Land Acquisition and Resettlement	7,400,000.00	7,400,000.00
Total:	117,034,478.10	238,878,839.15
Cost per Kilometer	5,350,636.77	9,546, 752.42

Source: JICA Survey Team

VIII.4 ECONOMIC ASSESSMENT

VIII.4.1 *Pre-Conditions for the economic costs and Benefit analysis*

The cash flow cost-benefit analysis performed was based on the following prior conditions:

1) Level of prices: 2011 prices
2) Year of opening: as form 2017
3) Evaluation period: 20 years after the year of the opening
4) Residual values: residual values were not found
5) Capital opportunity cost (expressed as discount rate): 12%
6) Conversion factor for the construction costs (of Economic Financial): 0,85 (tor the part of IVA and other taxes)

VIII.4.2 *Evaluation results*

The results of the economic evaluation are summarized as follows:

1) Alternative 1

- Economic Internal Rate of Return (EIRR) = 16,4%
- Benefit -Cost coefficient (B / C) = 1,39
- Present Net Value (VAN) = 23,95 million US Dollars.

2) Alternative 2

- Economic Internal Rate of Return (EIRR) = 7,4%
- Benefit -Cost coefficient (B / C) = 0,67
- Present Net Value (VAN) = -40,76 millions of US dollars.

The previous results indicate that the Alternative 1 (without extension to RN17) is economically feasible with an EIRR greater than the capital opportunity cost (> 12%), B / C with values higher than the unit(> 1,0) and positive NPV (> 0). On the other hand, Alternative 2 (extension to RN17) is not economically feasible due to the higher construction costs.

VIII.4.3 *Sensitivity Analysis*

- *Different scenarios for the sensitivity analysis*

In order to compare the soundness of the economic feasibility of the project, the sensitivity analysis were carried out by using the different costs and values of the benefits within a probable range compared to the base hypothesis of Alternative 1. The scenarios prepared for the sensitivity analysis are the following:

- The project costs are: 10%, + 15% y + 20%
- The project benefits are: -10%, -15% y 20%
- Different combinations of the previous scenarios

♦ *Sensitivity Analysis Results*

To summarize, the results of the sensitivity analysis are shown on the table below. The sensitivity analysis results show the soundness of the economic feasibility of the project of Alternative 1. Even for the scenario where the project cost increases by 20% (the benefit does not change), the Project maintains EIRR values greater than opportunity cost of capital (> 12%). In the case that the project benefits are reduced in 20% (the cost is not changed), the project continues being feasible. However, if the cost increases by 20% and the benefit is reduced by 15%, the project is not feasible.

TABLE No. VIII.9. SENSTITIVITY ANALYSIS RESULTS, ALTERNATIVE 1:

BENEFIT/COST	BASE CASE	-10%	-15%	-20%
Base Case	16.4%	14.9%	14.2%	13.4%
+10%	15.1%	13.7%	12.9%	12.1%
+15%	14.5%	13.1%	12.4%	11.6%
+20%	13.9%	12.5%	11.8%	11.1%

Fuente: Equipo de Estudio JICA

VIII.5 INDIRECT IMPACTS (QUALITATIVE ANALYSIS)

VIII.5.1 *General*

It is expected that the construction of the San Miguel Trunk Road will reduce the current and future traffic and congestion in the city of San Miguel and neighboring areas. At the same time, based on the direct benefits in the travel costs and traveling time savings, it will also generate significant indirect impacts for the regional and national socio-economic development. The main benefits are summarized here below.

VIII.5.2 *Regional benefits*

♦ *Take and promote the urban / regional economic development*

As already explained, the substantial improvement in the traffic in the city will promote business and development opportunities. At the same time, the trunk road is necessary to have a better and more organized urban and rural development. Urban expansion tends to be disorganized on the current arteries. A well planned Trunk Road has the function of preventing this phenomenon and guiding the use of the land. This brings economic development.

♦ *Contribution to agriculture production*

The Trunk road will be used to transport local products, like coffee, basic grains and pasture to the central markets and to Michinoeki (rest Station) in an appropriate and effective manner, consequently the farmers can expand their markets.

♦ *Promote industrial development*

A good road network and the improvements in the same are conditions that are required for industrial development. The present road connects the City of San Miguel with the Port of La

Union, which is the largest entry door for imports and exports. To promote industrial development and improve the operations of this port is required to strengthen the logistics corridors of the Eastern zone.

- *Tourism development*

The movement towards tourism sites in the Eastern zone is limited. Currently, there are more access facilities to the tourist sites located in the South, namely by the CA1 and CA2. The project will facilitate the movement towards the east and north, allowing the creation of better and safer tourist routes, creating opportunities and employment for hotels, restaurants and stores. Also, the movement towards and from the neighbor country Honduras will be promoted.

- *Access to health structures*

The main health centers are located in the central area of the city of San Miguel and in San Salvador, with roads in good conditions being a key element for the swift and timely transfer of patients in an emergency situation.

- *Access to education structures in all climate conditions*

In the Project area, there are 17 education institutions, which students will be able to use the Trunk Road to move easier and safely towards these centers every day. An important fact is that the passage is facilitated by the rivers in the area.

- *Impact on the daily lives of the residents*

The following positive opinions were obtained from the residents during the consultations:

1. The damage to vehicles because of roads in poor conditions will be reduced.
2. Community development is promoted
3. Improvement in traffic
4. Access to commercial activities
5. Access to the communities
6. Time savings and more employment opportunities
7. Expectation that the mini-buses operations will improve
8. Improved access to schools
9. Land added value

VIII.5.3 *Impacts on the national and international network*

- *Eliminates "bottleneck" in east-west corridor.*

At present, the most important cities are located on two important roads. In addition, a third road east-west is being constructed, which does not include the section to Honduras. The Trunk Road will contribute to improving these east-west corridors, eliminating the current congestion bottleneck in the City of San Miguel.

- *Access north - south*

The Trunk Road will contribute to connect these three important roads from north to south and improve the logistic corridors in the area, for the following reasons:

1. Communicating the three most important arteries going east to west
2. Inter-connection of the tourist resources located in the north-south zone
3. Improving access between primary products and the markets.