UNITED STATES

AGENCY FOR INTERNATIONAL DEVELOPMENT

MISSION TO EL SALVADOR

BASELINE DATA

(ROADS, BRIDGES

AND

WATER SUPPLY/SANITATION)

FOR THE

NATIONAL RECONSTRUCTION PLAN

OCTOBER, 1992

LEWIS TAYLOR, P.E.

ADDENDUM TO

BASELINE DATA
(ROADS, BRIDGES
AND
WATER SUPPLY/SANITATION)
FOR
THE NATIONAL RECONSTRUCTION PLAN

The attached three sheets, entitled Detalle General de Puentes que Requieren Reparación o Construcción, prepared by the Division Planning and Projects of DGC/Caminos sets forth a consolidated list of bridge construction requirements.

The total length of all bridges is 2,751.37 meters. Most bridges are on the primary and secondary roads, although 781 meters are shown on tertiary, Rural "A" and Rural "B" roads.

While this is a relatively extensive list, field inspection and requests from the mayors confirm this list is far short of the total need for bridges in El Salvador.

A study to inventory river and stream crossing needs is recommended in the body of the report.

Lewis B. Taylor, P.E.

23 October, 1992

MINISTERIO DE OBRAS PUBLICAS
DIRECCION GENERAL DE CAMINOS
DIVISION DE PLANIFICACION Y PROYECTOS

DETALLE GENERAL DE PUENTES QUE REQUIEREN REPARACION O CONSTRUCCION

PUENTES.001
MARZO/92

DEPARTAMENTO	NOMBRE	UBICACION	LONGT. (MTS)	OBSERVACIONES	TIPO CARRETERA
CABAÑAS	PTE. TITIHUAPA	RUTA No.6 EST. 21+000	50.00	SEMIDESTRUIDO (RECONSTRUCCION)	TERCIARIA
CABAÑAS	PTE.S/RIO SISICUA	NUEVERSOUE-STA.LUCIA-NVO.EDEN DE S.JUAN	9.60	EXISTE ESTRIBOS	RURAL B
CABAÑAS	PTE.S/RIO SAN ANTONIO	VIA VICTORIA-SAN PEDRO-EL PALOMAR	20.00	NO HAY PUENTE	TERCIARIA
		TOTAL	79.60		
LA PAZ	PTE. OAXACA	R.COMAL-LO.S.VICEN.-CA:2 EST.32	20.00	SUPERESTRUC. DAÑADA	SECUNDARIA
LA PAZ	PTE. [illegible]	CA:2+KM. 34+800	16.00	COLAPSADO (EXIT.PUENTE BAILEY)	PRIMARIA
LA PAZ	PTE. RIO JIBOA	CA:2-COMAL-SN.VICEN. EST.41	145.00	REFORZAR PILOTES	SECUNDARIA
LA PAZ	PTE. JALPONGA	CA:2-COMAL-SN.VICEN. EST.47+100	31.00	DINAMITADO (EXISTE PTE.BAILEY)	PRIMARIA
LA PAZ	PTE. SN. ANTONIO	R.ZACAT.-PTE.D'ORO-CA:2 EST.64+300	151.80	DINAMITADO (EXIST.PTE.BAILEY)	PRIMARIA
LA PAZ	PTE. EL POZON	R.ZACAT.-PTE.D'ORO-CA:2 EST.74	22.00	GRIETAS EN LOSA	SECUNDARIA
LA PAZ	PTE. RIO CUYULTITAN	INT.CA:1-CA:2 S.S.-COMALAPA EST.26	20.00	DAÑOS VIGAS Y LOSA	SECUNDARIA
LA PAZ	PTE. LAS CANAS	KM.76 ZACATEC.-TECOLUCA	16.00	RECONS.SUPERESTRUC.(EXIT.BAILEY)	SECUNDARIA
LA PAZ	PTE. JALPONGUITA	KM.54+600 AUTOP.COMALAPA	32.00	DAÑOS VIGAS Y LOSA	PRIMARIA
LA PAZ	PTE.S/RIO AMAYO	CA:2-KM 56-ESCUINTLA-LA PALMA-L.LONG.-HOJA DE SAL	20.00	NO HAY PUENTE	RURAL A
LA PAZ	PTE.S/QUEBRADA ORCOYO	CA:2-LAS DELICIA-OLOCUILTLA	22.00	NO HAY PUENTE	RURAL A
LA PAZ	PTE. S/RIO SAPOTITAN	SAN JUAN NONUALCO-EL GOLFO-LA VERANERA	24.00	NO HAY PUENTE	RURAL A
		TOTAL	419.80		
USULUTAN	PTE.S/RIO PINTO	PUERTO PARADA-PUERTO EL FLOR-CTON. EL LIMON	20.00	NO HAY PUENTE	RURAL A
USULUTAN	PTE. [illegible]	CA:2 KM. 89+200	13.20	REPA.VIGAS Y LOSA (EXIST.BAILEY)	PRIMARIA
USULUTAN	PTE. S/O EL COYOLITO	CA2: KM. 93+200	12.50	REPA. SUBESTRUCTURA	PRIMARIA
USULUTAN	PTE. DESVIO JIQUILISCO	CA:2 KM. 96+350	13.00	REPA. LOSA	PRIMARIA
USULUTAN	PTE. DESVIO LOS MANGOS	CA:2 KM. 96+400	13.00	REPA. LOSA	PRIMARIA
USULUTAN	PTE. PALO SECO	CA:2 KM. 97+990	14.00	REPA. SUPERESTRUC.(P.BAILEY)	PRIMARIA
USULUTAN	PTE. MEDRANA	KM. 131 CA:2-EL ESPINO	64.00	DESTRUIDO (NO HAY PTE.BAILEY)	SECUNDARIA
USULUTAN	PTE. USOA MARIN	CA:2-JUCUARAN	35.00	DESTRUIDO	SECUNDARIA
USULUTAN	PTE. S.MEDS.LEMPA(D/DES)	CA:2 KM. 82	300.00	DESTRUIDO	PRIMARIA
		TOTAL	484.70		
SAN MIGUEL	PTE. NICOLAS POLATO	R.CA:7-A.ZARCA-MAYUC.-R.VILL.3+100	6.00	REPA. ALETON	RURAL A
SAN MIGUEL	PTE. DON LUIS DE MOSCOSO	KM. 143 CA:1	137.00		SECUNDARIA
SAN MIGUEL	PTE. PICORA PACHA	KM. 123 CA:2	21.00		PRIMARIA
SAN MIGUEL	PTE.S/RIO SAN ESTEBAN	CA:7-AGUA ZARCA-MAYUC/QUIN-RIO UTILERIAS	23.00	NO HAY PUENTE	RURAL A
SAN MIGUEL	PTE.S/ESTERO DE CERIOLE	EL CUCO-EL ESTERITO-EL ESTERON	22.00	NO HAY PUENTE	RURAL A
SAN MIGUEL	PTE.S/RIO	CA:1-LOS RANCHOS-EL CEDRAL-LAS TABLAS-L.PELOTA	20.00	NO HAY PUENTE	TERCIARIA
		TOTAL	229.00		
MORAZAN	PTE. DE DOS LUCES	CA:7 KM.150 LO.S.RIS.-S.FCO.GTRA.	18.50	SOCAV.EN LADO PTE.	PRIMARIA
MORAZAN	PTE. TOROLA	CA:7 OSICALA-MEANGUERA	54.00		PRIMARIA
MORAZAN	PTE.S/RIO EL INGENIO	RUTA MILITAR-SOCIEDAD	11.00	NO HAY PUENTE	TERCIARIA
MORAZAN	PTE.S/RIO YAMABAL	GOTERA-YAMABAL	25.00	NO HAY PUENTE	TERCIARIA
		TOTAL	109.50		
AHUACHAPAN	PTE.GRAL.M.J.ARCE	CA:2 KM.125 L.F.EL SALV.-GUAT.	80.62	GRIE. LOSA,P.CENT., ETC.	PRIMARIA
AHUACHAPAN	PTE. ESCALANTE	CA:8 KM. 95+800	22.00	REPA. SUBESTRUCTURA	SECUNDARIA
AHUACHAPAN	PTE.LOS NARANJOS	SAN JOSE EL NARANJO L/DELICIAS-CA:2	15.00	NO HAY PUENTE	RURAL A
		TOTAL	117.62		

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PUENTES.U01
MARZO/92

DEPARTAMENTO	NOMBRE	UBICACION	LONGT. (MTS)	OBSERVACIONES	TIPO CARRETERA
SANTA ANA	PTE. AGUA SARCA	CA-12 KM. 69+200	4.20	COLAPSADO (P.BAILEY)	PRIMARIA
SANTA ANA	PTE.S/RIO SUQUIAPA	R (STA.ANA-S.PABLO TACACHICO)E.COBANO-L.APOYOS	25.00	NO HAY PUENTE	RURAL B
SANTA ANA	PTE.S/RIO EL JUTE	ALDEA ROLANDS-S. JERONIMO-EL PARAISO	15.00		RURAL A
		TOTAL	44.20		
SONSONATE	PTE. AGUA CALIENTE	R.CALUCO-LA ENSENADA EST. 1+000	8.65	2 VIGAS CONC.SIN APOYO	TERCIARIA
SONSONATE	PTE. LAS TABLAS	R.CA-12-STA.EMILIA-CANTON L.TABLAS KM. 2	8.00	SUPERST.CAÑADA RECONSTRUCCION	RURAL B
SONSONATE	PTE. STA.EMILIA	R.CA-8-STA.EMILIA-L.TABLAS K. 1+300	31.20	LOSA EN MAL ESTADO	TERCIARIA
SONSONATE	PTE. APANCOYO	CA-2 KM. 96+100	31.00	ESTRIBO SOCABADO	PRIMARIA
SONSONATE	PTE. BANDERA	CA-2 KM. 105+300	84.50	ESTR.PON. C/REVENTADURA	PRIMARIA
SONSONATE	PTE. 3 CEIBAS(P.2 NIVE.)	CA-8 SONSO.-LD.LA LIBERTAD. K. 37	10.40	GRIETAS SUBESTRUCTURA	PRIMARIA
SONSONATE	PTE.S/RIO NEGRO	CA-12-CERCA IZALCO	18.00	RECONSTRUCCION	
		TOTAL	191.75		
LA LIBERTAD	PTE. S/R ZUNZAL	CA-2 KM. 44	33.00	SOCABADO ESTRIBO IZQ.	PRIMARIA
LA LIBERTAD	PTE. EL ZONTE	CA-2 KM. 53	55.00	ESTRIBO SOCABADO	PRIMARIA
LA LIBERTAD	PTE. S/R TAQUIO	CA-2 KM. 61+550	58.00	ESTRIBO SOCABADO	PRIMARIA
LA LIBERTAD	PTE. IRA	CA-1 - SAN JUAN OPICO	43.00	FALLA EN ESTRIBO	SECUNDARIA
LA LIBERTAD	PTE. TEPEMICHO	R.SN.P.TACACHICO-LD/STA.ANA 57+200	12.50	SOCABACION EN PTE.	TERCIARIA
LA LIBERTAD	PTE. PASO HONDO	R.S.P.TACACHICO-EL PAISNAL EST.53	26.00	SOCABACION EN PTE.	TERCIARIA
LA LIBERTAD	PTE. S/Q EL JOCOTE	R.QUEZALTE.-LAS FLORES EST.11+100	11.00	LOSA DEFORMADA	RURAL A
LA LIBERTAD	PTE. S/R COLON II	CA-1-ZAPOTITAN EST.7+300	18.20	SUBE ST., SUPERES., MAL E.	RURAL A
LA LIBERTAD	PTE.S/QUEBRADA FLORENCIA	CA-4-N.CUSCATLAN-HUIZUCAR	20.00	NO HAY PUENTE	RURAL A
LA LIBERTAD	PTE. S/QUEBRADA S.N.	CA-4-ASUCHILLO-EL TRIUNFO	15.00	NO HAY PUENTE	RURAL B
		TOTAL	291.70		
SAN VICENTE	PTE. APANTA	RUTA ZACAT.-TECOLUCA KM. 81	7.80	DESTRUIDO	PRIMARIA
SAN VICENTE	PTE. EL CARRISO	RUTA 227 EST. 71+280	10.60	GRIETA EN LOSA	PRIMARIA
SAN VICENTE	PTE. QDA.SECA CA-1	CA-1 KM. 79	12.00	PILA CENTRAL CON FALLO	SECUNDARIA
SAN VICENTE	PTE. CUSCATLAN	CA-1 KM. 90	320.00	DESTRUIDO	SECUNDARIA
SAN VICENTE	PTE. LAS CAÑAS	RUTA ZACAT.-TECOLUCA KM. 77	13.50	DESTRUIDO	SECUNDARIA
SAN VICENTE	PTE. TITIHUAPA	RUTA 735 EST. 18	65.60	GRIETAS EN LOSA	TERCIARIA
SAN VICENTE	PTE. LA ZORRA	RUTA 740 EST. 5+980	11.30	DESTRUIDO	TERCIARIA
SAN VICENTE	PTE.S/RIO AGUA CALIENTE	RAMAL TECOLUCA-ZACATECOLUCA (EL PLAYON)	12.00	DINAMITADO	TERCIARIA
SAN VICENTE	PTE. S/RIO AMAPULA	S.VICENTE-CHUCUYO-LA JOYA PARRAS LEMPA	8.00	NO HAY PUENTE	RURAL B
		TOTAL	460.80		
SAN SALVADOR	PTE. AGUA CALIENTE	KM. 4 CARRETERA ANTIGUA A SOYAPANGO	32.00	COLAPSADO (PTE.BAYLEY)	PRIMARIA
SAN SALVADOR	PTE.S/RIO EL OBRAJE	CA1-KM.9 PTE. EL TORIL S.LAUREANO-EL CORTEZ	16.00	NO HAY PUENTE	RURAL B
SAN SALVADOR	PTE. S/RIO ACELHUATE	GUAZAPA-CTON.EL BONETE-NEJAPA	15.00	NO HAY PUENTE	RURAL B
SAN SALVADOR	PTE.S/RIO LAS CAÑAS	SOYAPANGO - TONACAPETEQUE	60.00	DINAMITADO	TERCIARIA
		TOTAL	123.00		

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PUENTES.W01
MARZO/92

DEPARTAMENTO	NOMBRE	UBICACION	LONGT. (MTS)	OBSERVACIONES	TIPO CARRETERA
CHALATENANGO	PTE. S/R MUCA	CHAL.-S.FCO.LEMPA-S.LUIS D/C.0+300	11.00	ESTRIBOS EN MAL ESTADO	TERCIARIA
CHALATENANGO	PTE. S/R EL GRAMAL	CA;4 TEJUTLA-EL POY EST.22 KM.82+190	26.30	COLAPSADO (EXIST.P.BAILEY)	SECUNDARIA
CHALATENANGO	PTE. CO.G. S/R METAYATE	CA;2 KM. 5+950	60.00	FALLAS ESTRUCTURALES	SECUNDARIA
CHALATENANGO	PTE.S/RIO TAMULASCO	CHALATENANGO-CANCUYO-CHAPAS	24.00	NO HAY PUENTE	RURAL A
CHALATENANGO	PTE.S/RIO MUCA	CHALATENANGO-CTON.S.J.CRIO-L.MESITAS-AZACUALPA	13.00	NO HAY PUENTE	RURAL B
		TOTAL	134.30		
CUSCATLAN	PTE.S/RIO TEMPISQUE	CA;1-MONTE S.J.-C.CAND.-S.ANDRES-EL CARM.O.AGUA	15.00	NO HAY PUENTE	RURAL B
CUSCATLAN	PTE. S/RIO UUCUYO	CA;1-KM.41-CTON.COCO VERDE-ROSARIO CUSCATLAN	12.00	NO HAY PUENTE	RURAL B
		TOTAL	27.00		
LA UNION	PTE.S/QUEBR. P.CONCHAGUA	CA;1-BOBADILLA-SAN ALEJO	20.00	NO HAY PUENTE	TERCIARIA
LA UNION	PTE.S/RIO AZACUALPA	NUA.ESPARTA-POLORDS	20.00	NO HAY PUENTE	RURAL A
		TOTAL	40.00		
		TOTAL GENERAL	2,751.37		

The consultant has worked closely with infrastructure agencies of the GOES, the Secretariat for National Reconstruction, the National Commission for Area Restoration, and USAID/El Salvador in collection and interpretation of information presented in this report. Nevertheless, the opinions expressed, conclusions drawn and recommendations made are the responsibility solely of the author. No endorsement or concurrence by the cooperating agencies should necessarily be assumed or inferred.

Eng. Lewis Taylor

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Louis Berger International, Inc.

Paul Woodbury, Ted Tiedeken, David Douglass

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ACRONYMS

AID	US Agency for International Development; Agencia para el Desarrollo Internacional de Estados Unidos
ANDA	Administración Nacional de Acueductos y Alcantarillados; National Administration for Water and Sewers
BID	Banco Interamericano del Desarrollo - Interamerican Development Bank
CONARA	Comisión Nacional de Restauración de Areas; National Commission for Area Restoration
ERD	Earthquake Reconstruction Division; División para Reconstrucción del Terremoto
DGC/ CAMINOS	Dirección General de Caminos - DGC; General Directorate for Roads - MOP
GOES	Government of El Salvador; Gobierno de El Salvador
HPN	Health, Population and Nutrition - USAID; Salud, Población y Nutrición
IDB	Interamerican Development Bank; Banco Interamericano de Desarrollo - BID
IRD	Infrastructure and Regional Development Office USAID; Infraestructura y Desarrollo Regional
LBII	Louis Berger International, Inc.
MEA	Municipalidades en Acción; Municipalities in Action
MIPLAN	Ministerio de Planificación y Coordinación para el Desarrollo Econónico y Social; Ministry of Planning and Coordination for Economic and Social Development
MOP	Ministerio de Obras Públicas; Ministry of Public Works
MSPAS	Ministerio de Salud Pública y Asistencia Social; Ministry of Public Health and Social Welfare
NRD	National Reconstruction Division; División Nacional de Reconstrucción
PLANSABAR	Plan Nacional de Saneamiento Básico Rural; National Plan for Basic Rural Sanitation

PRN	Plan de Reconstrucción Nacional; National Reconstruction Plan
RUD	Rural and Urban Development; Desarrollo Rural y Urbano
SRN	Secretaría de Reconstrucción Nacional; Secretariat for National Reconstruction
USAID	See AID

EXECUTIVE SUMMARY

This report addresses solely the sub-sectors of rural roads/bridges and water supply/sanitation in the 115 municipalities of the ex-conflictive zone.

In the roads/bridges and potable water/sanitation sub-sectors, proposed sub-projects for reconstruction have been prepared by the SRN, the mayors and CONARA, MOP/DGC-Caminos, ANDA, and PLANSABAR. The proposed work by each group or agency reflects its parochial interests, or the portion of the sub-sector for which it is assigned responsibility. None of the agencies has prepared a total plan reflecting total national reconstruction need in the ex-conflictive zone for either sub-sector.

Needs far exceed resources, of course. In order to assure that the limited resources are devoted to solving problems of local people rather than spent in improving already reasonably acceptable conditions around population centers, all national reconstruction plan resource allocations and sub-project implementation should be either controlled or strongly influenced by the SRN and the mayors. It follows that nearly all new funds which are, or become, available, including USAID Project No. 519-0394 should be allocated to sub-projects selected by SRN after consultation with the mayors, or in direct response to requests from the mayors.

A target for rural roads at the municipal level is suggested at 400 Km. per year, distributed over all 115 municipalities, although not necessarily evenly. Some single sub-projects may involve up to 30 or more kilometers of rural road. The cost of this construction will be about $7,500,000 per year. Nearly all would be spent by the municipalities, although SRN might assign specific large sub-projects to DGC-Caminos. And the additional funds allocated to roads for control by SRN would be in addition to the Project No. 320 road work managed through DGC, and in addition to the regular CONARA/MEA budget for the usual small sub-projects.

In bridges, the need has been determined by field inspection to be immense, but still unknown in total. There are literally hundreds of stream crossings on all classes of roads; on lower class roads most are fords which are impassable much of the year. It is not necessary that bridges be placed on all these crossing; paved fords would serve until more traffic develops. But inspection shows a real need for many bridges where none now exist. At some sites bridges were destroyed during the insurgency; in many places needed bridges have never been built.

An inventory of stream crossing needs is suggested. In the meantime, construction should go forward on known sites where bridges have been destroyed or where road crossings depend on low

water fords which cause entire municipalities and many cantons to be isolated during the rainy season.

A reasonable annual target for a four year program implemented by the combined efforts of the municipalities and DGC is 500 meters of bridges of all types per year. Cost of such a bridge program is estimated at approximately $3,000,000 per year, for not less than four years. With only rare critical exceptions, construction under this program should be limited to tertiary and lesser rural roads. In summary a rural road and bridge program lasting four years and costing a total of $42,000,000 can be used effectively and should be funded.

Obviously, where existing bridges serve the public safely, even if those bridges are temporary, work on them should be restricted to regular maintenance until al least the most critical stream crossing problems are solved in the countryside. Scarce resources should not be diverted from the primary task of national reconstruction in the outlying departments and municipalities.

Potable water and sanitary facilities; in rural areas, usually latrines; go together. Latrines can be installed to good effect independent of potable water systems, but potable water systems should never be installed without assuring that sanitary facilities exist, or are installed as part of the same sub-project.

Therefore, water/sanitation both are to be considered as integral parts of sub-projects under projects which support the PRN.

It is estimated than an annual investment nationwide in rural water systems of at least $8,000,000 (actually increasing each year) will be required to serve a population increment equal to the projected annual increase in rural population. That rate should result in an increase in rural coverage or about 1.6% per year, average. An annual average investment of $6,500,000 per year should result in a net average increase in potable water coverage by 1% of the rural population each year. If the ANDA estimate of 12.4% for rural water coverage in 1991 is correct, an investment of about $65,000,000 would provide water to 22.4% of the rural population by the year 2002. Or an investment of $8,000,000 per year for five years could provide 20.4% coverage in five years.

In national reconstruction, it is proposed that any new funds for water supply be concentrated first on identified problem locations. At the top of the priority list should go the 38 municipalities which operate municipal systems in the ex-conflictive zone. Along with these, should be eight municipal towns which have no systems at all. ANDA has a program, funded by IDB, to renovate 65 systems owned and operated by ANDA in the ex-conflictive municipalities.

The total cost of a program to study, design, and construct new or improved systems in these 46 towns is conjectural until a

preliminary engineering report is completed for each town. For planning purposes, a total cost for the 46 towns is estimated at approximately $11,000,000; approximately $2,750,000 per year for four years.

The many hundreds of caserios and cantons which need renovation of existing non-functioning water systems, or deteriorated systems repaired and expanded, or complete new systems built, are being addressed currently, though not always effectively, by Project No. 320, MEA/CONARA, PLANSABAR, and at least one or two PVOs. It is reported that IDB may continue to fund PLANSABAR if the agency is separated from MOH and becomes autonomous.

Ideally in a rural water program one hopes to see an annual increase in the percentage of the rural water population that has access to potable water and has learned to take advantage of it. In the present case reliable and believable data are not going to be available for the next few years for a number of reasons.

- There is no single national coordinating office for collecting data or statistics on all systems installed by all participants.

- There is no way to make allowances systematically for the loss in covered populations when systems break down and are not repaired.

- Until the census is finished, hard population data is not available. All population estimates; and population increase projections; of which there are several, are best current projections proceeding from an uncertain base.

The important parameter in setting a target for rural water is the rate of increase in covered population, and not the absolute number of total covered population. In this sense, the direction one is headed and at what rate are the critical parameters.

It is estimated that it may be possible to increase coverage of the rural population with reasonable access to potable water by as much as 2% per year with the combination of all current programs working effectively; a more realistic projection probably is an increase of 1.5% net increase per year.

To recap, realistic four year programs in roads, bridges, and water/sanitation can be summarized in Table E.S.1 below:

TABLE E.S.1

SUB-PROJECT FUNDING AND ANNUAL TARGETS
IN THE EX-CONFLICTIVE ZONE

Sub-Project	New Funding Annual Cost Project No. 394 and Other Donors $	Annual Target for 4 Years
Rural Roads, Tertiary and below	7,500,000	400 Km/year of road
Bridges and Stream Crossings	3,000,000	500 meters of bridges of various lengths
Municipal Water	2,750,000	11-12 towns/ year
Rural Water	* None. Use existing funds. Project No. 320 and other donors	1.5% per year increased coverage of rural population

* The need is great, with several hundred cantons and caserios identified as needing new water supply systems, or renovation of existing systems. Unfortunately, indigenous institutions have not yet shown capacity to absorb funds beyond what is currently available.

The above costs and targets can be adjusted up or down depending on availability of funds but these targets and rates of expenditure should be within the capability of existing implementing organizations if technical assistance is provided as outlined in the full report.

The goals or objectives of the reconstruction plan can be expressed in other forms, of course. Some possible alternatives are shown in Appendix S, to correlate directly with some of the problems reported in Appendix R.

The four year time table in Table E.S.1 is established arbitrarily to coincide with the time remaining for execution of the national reconstruction plan. At the end of that period there will remain a large backlog of sub-projects in rural roads, bridges,and rural water supply/sanitation.

The need is great and immediate.

I. INTRODUCTION

A. PURPOSE

The Purpose of this report is to establish lists of engineering, study and construction sub-projects which can be used as base line data in implementing and monitoring progress of reconstruction in 115 affected municipalities in twelve departments under the National Reconstruction Plan generally, and specifically in execution of USAID Project No. 519-0394. Sub-project lists developed herein include improvements, re-construction, or new construction for roads (secondary, tertiary, Rural "A", Rural "B", and vecinal), bridges, and water and sanitation systems. Urban streets are not included, although streets in small rural towns are included in vecinales; neighborhood roads.

B. BACKGROUND

The GOES, with foreign assistance, has embarked upon a national reconstruction program with the objective of restoring economic and social institutions which were disrupted by twelve years of civil war. Improving transportation for movement of people and commercial goods is a critical part of national reconstruction. Safe and reliable potable water systems and sanitation are essential to the health and well being of the people in the affected areas. Reconstruction is intended to meet current needs, and not solely to restore facilities to pre-war status.

To provide data for planning and financing of required improvements in road systems, and in water/sanitation systems, it is essential that specific needs be identified. Insofar as is possible, the work is defined in this report by describing discrete construction tasks, or sub-projects to be performed on those systems.

This report thus identifies sub-projects and the approximate, or order of magnitude costs thereof. Each will require further definition and site-specific design and estimates before work actually begins.

It has been determined that the areas most seriously and directly affected by war comprise 115 municipalities in twelve different departments of the nation. This report lists representative sub-projects which should be implemented in those 115 municipalities as of the date of the report, although the sub-project lists are by no means all-inclusive of work that needs to be done during the next five years.

It is not recommended that road and bridge work should be limited only to the 115 municipalities. Repair of roads and bridges outside the areas, in order to assure access to the afflicted zone, will be important in some cases. Such work might be necessary under the reconstruction plan or could be performed under other

programs managed by the Ministries, depending on source and availability of funds.

C. METHODOLOGY

Various indigenous and foreign agencies have collected and reported data concerning conditions of roads, bridges, and water/sanitation systems inside the affected zone, or afflicted municipalities. An effort has been made to assemble data from those agencies, and to compare it with earlier assessments. In some cases, data supplied by others that report conditions of roads, bridges, and water/sanitation systems have been verified by field inspection. No attempt was made to visit all the roads or water systems in all of the municipalities in all the departments because of time limitations. Inspections were made of a number of proposed sub-projects in several departments to verify validity of available data, however, and to determine conditions where no data were available. In a few cases, sites which should have been visited were not because of weather, road conditions, or other reasons. In those cases, best estimates were made on the basis of information available.

D. FUTURE CHANGES

These lists of sub-projects will serve as a guideline for planning purposes but it should be expected that details will change over the next few years. There already have been changes in the list of conflictive municipalities since the National Reconstruction Plan was published in March, 1992. Deterioration not now evident will occur, populations may shift, and in some case repairs may be made by others without reference to the usual implementing authorities.

E. SUB-PROJECT LISTINGS

Sub-projects are listed in this report without regard for availability of funds to execute the work, although the source of funds to build sub-projects already programmed or proposed is given where known and applicable. Sub-projects already programmed but not begun are included in the sub-project lists in Appendices, as well as perceived needs for reconstruction or heavy maintenance projects not funded to date. The object of this report is to establish a current representative list of needs which may be met under Project No. 394 insofar as they can be identified at this time.

Neighborhood roads, or vecinal roads, are estimated to comprise approximately 22% of the road net nationwide, although a current inventory of all of them now in existence or be developed by upgrading trails, probably would show this percentage to be low. These roads are built and maintained by local authorities other than the Directorate General of Caminos; usually the municipalities. Where repair, reconstructions or re-opening of

such roads or bridges, have been identified, those sub-projects are included in the appropriate Appendix. Many are sub-projects which could be undertaken by municipalities under the MEA program, although the total need exceeds resources currently available or expected in that program.

At this time, all construction under the MEA program is demand driven by the local population, and it is not possible to predict the priorities that different municipalities will attach to the various types of projects which may be eligible for financing with MEA funds.

In water supply and sanitation, the total funding needs in the long term will be much greater than shown in this report, because systems will need to be upgraded and expanded and new ones added as population grows and shifts. Predicting of the total need will require a study of many months to define needs and alternatives more precisely. Order of magnitude requirements are discussed to show the need for a great infusion of funds into the rural water/sanitation sub-sector.

All rural cantons are reported to need latrines in some departments. No purpose would be served by trying to estimate all of the latrines that would be required in all of the cantons in 115 municipalities.

Finally, this report identifies engineering studies that should be initiated now to more clearly define the work to be done under specific identified sub-projects.

II. THE SETTING

A. GENERAL

1. One hundred and fifteen municipalities in twelve departments have been designated as those most affected by hostilities. These municipalities are referred to as the "ex-conflictive zone". This zone is that which is addressed primarily by the National Reconstruction Plan and by USAID Project No. 519-0394. The list of departments and municipalities is shown in Appendix "A". Rural roads, bridges, and water/sanitation systems are in disrepair; some from direct war inflicted damages, but the greater parts due to twelve years of neglect and lack of proper maintenance.

In many areas, especially in mountainous regions, badly needed small bridges have never existed but are now being built. Many more are needed. These bridges are part of an effort to help bring rural areas into the economic and social mainstream of the country and thus to improve the productivity and well being of rural people. Programs for construction of a number of small rural water systems are in progress.

2. Programs of reconstruction are underway on several fronts in highways, roads, bridges, water supply, and sanitation as shown in the appendices. There is no valid reason to change the objectives or sub-projects already scheduled at this time, since all the sub-projects now scheduled are needed. To do so would result in delay and confusion and probable depreciation of resources due to inflation and non-productive overhead costs.

Efforts can be better spent in improving the procedures under which the various agencies work to try to improve productivity and the rate at which quality construction can be put in place, and in allocation of resources to sub-projects identified but not funded.

There are at least four areas in which additional study and effective implementing methodology are needed. Due to the lack of technical information available on individual systems, the magnitude of resources required cannot be defined with precision. It has been beyond the scope and resources of this report to develop the necessary details. However present contracting and funding procedures have not demonstrated capability to deal with the number and size of the sub-projects that are expected to be necessary to meet the need within a reasonable time frame (two to four years). All three areas are discussed in more detail later in this report.

These four areas are:

a. Vecinal, or neighborhood, roads. These are not a part of the DGC national road network, but are the responsibility

of local authorities. The mayors probably will need at least technical assistance in coming to grips with a program to repair, improve, or reopen roads from the municipal town to the cantons, between cantons, and between cantons and caserios. So far the mayors have done a good job of improving short sections of streets and roads in a number of municipalities, but a need exists to rebuild or improve many sections of up to several kilometers each. In fact, reports from mayors show great numbers of cantons and communities not accessible by motor vehicle. See Appendix R.

b. Water systems operated by the municipalities. There are 38 municipal, as opposed to ANDA, systems in municipal towns in the conflictive zone that have had little maintenance during the war. Little is known about details of their technical condition, but inspections of similar systems operated by ANDA show all of them to be in need of repair and improvement. Repairs and improvements to 65 of the ANDA systems in the ex-conflictive zone are scheduled under an IDB funded project. Detailed inspections and preliminary engineering studies are needed for all of the municipal systems, as well as funding to rehabilitate them. Further, a better vehicle for providing technical and financial assistance to the municipalities may have to be developed or expanded to fund and execute work of the magnitude required. Work should be done by the municipalities or under their control but they may need assistance similar to that provided by CEL and NRECA for electric systems.

c. Eight municipal towns in the ex-conflictive zone do not have water systems, according to ANDA reports. Some have been found to have rudimentary and inadequate systems, but preliminary engineering studies of these municipalities are needed also. It then must be decided whether some type of water system should be built, and if so the type, size, and cost of the new or improved system. Where new systems are indicated, a method to assist the municipalities in meeting their needs more quickly and completely can be developed.

d. Bridges and stream crossings on rural roads, tertiary and below have been badly underreported and costs underestimated. A national inventory and evaluation of bridge requirements and alternate stream crossing methods should be begun at once.

In all of these areas it will be essential that studies, and construction if any, be coordinated closely with the mayors, if not done by them.

B. ROADS AND BRIDGES

According to the figures supplied by DGC the total length of rural (tertiary and lesser classification) roads in the twelve affected department amount to 9,048 Km. Of this total, 6,945 Km. are part of the national network under jurisdiction and the responsibility

of MOP/Caminos. Two thousand one hundred and three Km. are caminos vecinales, or neighborhood roads, that are the responsibility of the municipalities. A strong possibility exists that the total length of caminos vecinales may be under reported.

The portion of the PRN for roads is shown in Appendix C. Field inspection shows this plan to fall far short of meeting needs for both roads and bridges. The DGC plan for roads is shown in Appendix D. It is more nearly complete but so far is not funded. And there are several gaps in it. In fact, in addition to other deficiencies, the DGC plan shows no road work in the department of Morazán. Field inspection shows that the vast majority of rural roads in Morazán are in need of repair, much of it major work on drainage.

The actual length of each class of national road in each municipality is being determined by Louis Berger International, Inc. and DGC in the process of performing a national road inventory. No such inventory yet exists for the caminos vecinales.

The lengths of various classes of rural roads (tertiary and lower class roads) as reported by DGC, including those in the national (MOP/Caminos) network in each department in the ex-conflictive zone is shown in Appendix B.

A number of bridges are listed for repair or reconstruction in the National Reconstruction Plan, and in the Plan of DGC as shown in Appendices F and G. Additional needs have been identified in collecting data for the report.

It is noteworthy that reconstruction strategy of the MOP has had as its first objective the replacement of Bailey bridges on primary and secondary roads rather than immediate repair, replacement, or new construction of bridges in the ex-conflictive municipalities. The Bailey bridges removed would then be reinstalled for use on lesser roads. On the surface, this approach has an apparently logical appeal. However, it is not endorsed or recommended in this report.

Replacement of long span Bailey bridges will require relatively large cash investment at a time when resources to do all the work required in the ex-conflictive zone are, as of this date, inadequate. First priority should go to rural, lesser, roads, and emphasis placed on proper maintenance of the Bailey bridges to keep them functional.

Construction of long span bridges is of such a nature than new ones can be placed in service two to five years from now. In the meantime, bridges on the lesser roads to serve the rural population and encourage economic revival in the countryside are needed as soon as possible.

The total of all Bailey bridging in place will meet only a small part of the need for bridges on rural roads. Work on rural road bridges should begin now and go forward at a steady pace. When the Bailey bridges are eventually replaced, there will still be a use for them on rural roads, where some needs will remain unmet.

C. WATER/SANITATION SYSTEMS

In the 115 municipalities, 68 of the municipal towns are served by ANDA. Thirty-eight municipal towns operate their own systems, and one is operated by PLANSABAR. Eight municipal towns do not have water systems.

The need for improvement, expansion, construction or reconstruction of water supply systems and sanitary facilities is almost universal in municipalities, cantons, and caseríos. There are small systems, mostly ones that are spring fed, that operate properly and serve the people adequately, albeit even on those systems some families carry water several hundred meters. Most systems with pumps need renovation. Latrines and other waste disposal systems are inadequate in even the larger towns with functioning sewer systems.

Under the reconstruction program and Project 394, including Project 320, water and sanitation facilities can be provided for part of the population but many communities will still be in need of water system improvements when those projects are completed.

For instance, ANDA has in inventory approximately 900 hand pumps. If each of those pumps serves an estimated 25 families, or 138 people, 900 pumps can provide water for approximately 125,000 persons. To those 125,000 the water will be of great benefit, but that number is less than the annual increase in population in El Salvador, and about 4.6% of the current estimated rural population.

The above discussion is meant to demonstrate the need for water system construction and improvement, and the need to do the job as rapidly as possible to serve as many people as possible. But it also shows, qualitatively, the massive investment required in water system construction and repair in order to make large inroads in the water supply problem.

A significant impact can be made in a short time in areas where resources can be directed under Project No. 320, but work has not yet begun on a major scale. As noted elsewhere, the project will make a valuable but not major change in the percentage of people served with potable water.

No technical study or evaluation of the 38 municipality operated water systems has yet been made by engineers whose professional specialty is water supply, although some engineering work has been done on at least one of them. Conversely, of the 68 ANDA systems

in the conflictive zone, 30 have been evaluated and scheduled for repair and improvement under the first phase of an IDB funded project with ANDA. In total, the IDB project will finance work at 148 sites nationwide, 65 in the ex-conflictive zone. Cost of improvements to the first 30 ANDA systems will be over $7,000,000 including engineering and contract administration. The list of ANDA systems to be improved under the IDB program is shown in Appendix N. A similar sub-project, with focus on the municipal systems in municipal towns, could improve water supply for the greatest number of people in the shortest time in the ex-conflictive zones. Municipal towns without water systems should be studied at the same time.

Any investment in water supply must include as an integral part the upgrading of sanitary facilities, whether latrines or sewers, to dispose of wastes generated by additional availability of water.

Concentration on the municipal towns will not address the problems existing in the cantons and caserios, some of which are to be alleviated by Project 320 with planning already in progress. And there are additional existing systems that also need repair. In particular, several systems installed by PLANSABAR and funded by IDB, are in poor repair. They are not specifically included in any funded project although some of them can and will be repaired under Project 320. In fact PLANSABAR has furnished a list of 52 systems for repair under the project, but 119 more are in need of rehabilitation also, nationwide. Seventy-three are in the ex-conflictive zone. See Appendix J.

If it were possible to turn PLANSABAR systems over to the municipalities, and if the municipalities would accept them after they are renovated, a separate project for repairs funded by another donor or IDB might be feasible. This would require careful negotiation between IDB and the Ministry of Health, however, before ownership could be transferred. Otherwise, it is doubtful that anyone is interested in funding repair of many of the systems until system management and maintenance is improved. USAID might choose to finance a study of the condition of all of the PLANSABAR systems and to confirm PLANSABAR estimates of the cost of necessary repairs, at least in the ex-conflictive zone. Further, mayors may choose to repair some of them under the MEA program, but only minimum necessary repair is recommended until the future of the systems is clarified and better maintenance funding assured. It is the conclusion of this report that the best chance for long term success of those systems will exist under municipal management if that can be arranged.

Table No. II.1 shows data developed by ANDA to report potable water and sanitation service provided by all sources nation wide, as of December, 1991. Note that small rural systems installed by municipalities and by NGOs are not included, so rural coverage may be underreported by a few tenths of a percentage point. But when

the number of systems out of service is considered, the numbers probably are a very close approximation.

In any event, Table No. II.2 converts these population numbers to percentages. Note that 12.4% of the rural population is reported to have potable water service or reasonable access thereto. While this is 0.8% higher than the percentage served one year earlier in 1990, it is still 0.6% below the 13% coverage accepted as authorative in 1989. The drop can be explained by population increases, and the installed systems that have become inoperative and have not been repaired.

TABLE No. II.1

POPULATION WITH POTABLE WATER, SANITATION AND LATRINE SERVICE
AT NATIONAL LEVEL
DECEMBER, 1991

POPULATION SERVED BY	POTABLE WATER				SANITATION		
	URBAN		RURAL		URBAN		RURAL
	HOUSE CONNECTION	EASY ACCESS	HOUSE CONNECTION	EASY ACCESS	HOUSE DISCHARGE	LATRINES	LATRINES
NDA	1,980,408	109,500	75,240	1,800	1,573,248	---	480
LANSABAR	1,216	---	251,517	11,337	---	670,863	1,126,099
AYOR'S FFICES	72,214	---	---	---	---	---	---
ELP SUPPLIED OMMUNITIES	133,086	---	---	---	---	---	---
O T A L	2,186,924	109,500	326.757	13,137	1,573,248	670,863	1,126,579

Source: OPS Report (1987) National Basic Rural Sanitation Plan (PLANSABAR) and ANDA's Planning Division.

TABLE No. II.2

NATIONAL LEVEL COVERAGE OF POTABLE WATER AND SANITATION SERVICES
PERIOD: 1990-1991

CONCEPT	POPULATION COVERTURE (%)					
	1990			1991		
	ANDA	OTHERS	TOTAL	ANDA	OTHERS	TOTAL
URBAN WATER	**78.8**	**8.4**	**87.2**	**79.1**	**7.8**	**86.9**
Population w/house connection	74.4	8.4	82.8	75.0	7.8	82.8
Population using public hyd.	4.4	---	4.4	4.1	---	4.1
RURAL WATER	**2.5**	**9.1**	**11.6**	**2.8**	**9.6**	**12.4**
Population w/house connection	2.4	8.7	11.1	2.7	9.2	11.9
Population using public hyd.	0.1	0.4	0.5	0.1	0.4	0.5
GLOBAL WATER COVERAGE	**38.4**	**8.7**	**47.1**	**40.3**	**8.7**	**49.0**
Population w/house connection	36.3	8.5	44.8	38.2	8.5	46.7
Population using public hyd.	2.1	0.2	2.3	2.1	0.2	2.3
URBAN SANITATION	**59.5**	**27.2**	**86.7**	**59.6**	**25.4**	**85.0**
Population w/sewer connection	59.5	---	59.5	59.6	---	59.6
Population w/latrine available	---	27.2	27.2	---	25.4	25.4
RURAL SANITATION	---	**38.4**	**38.4**	---	**41.2**	**41.2**
Population w/latrine available	---	38.4	38.4	---	41.2	41.2
GLOBAL SANITATION COVERAGE	**28.8**	**33.1**	**61.1**	**29.3**	**33.4**	**62.7**
Population w/sewer connection	28.8	---	28.8	29.3	---	29.3
Population w/latrine available	---	33.1	33.1	---	33.4	33.4

Source: ANDA's Planning Division.

Tables Nos. II.3 and II.4 show the population data upon which ANDA developed these figures. The annual rate of population increase looks extremely low. It is perhaps possible that out migration makes these figures realistic. Verification or correction should result from the census now in progress. The statistics reported by USAID/HPN show higher figures for both population and population growth. All figures now in use must be handled gingerly until the census is completed, however.

TABLE No. II.3

ESTIMATED POPULATION BY DEPARTMENT
1991

DEPARTMENT	URBAN	RURAL	TOTAL
AHUACHAPAN	64,400	216,692	281,092
SANTA ANA	212,903	271,979	484,882
SONSONATE	149,281	251,052	400,333
CHALATENANGO	58,000	93,308	151,308
LA LIBERTAD	266,000	283,434	549,434
SAN SALVADOR	1,288,900	192,460	1,481,360
CUSCATLAN	61,100	138,266	199,366
LA PAZ	80,814	182,698	263,512
CABAÑAS	32,000	104,473	136,473
SAN VICENTE	53,959	117,209	171,168
USULUTAN	112,842	274,347	387,189
SAN MIGUEL	155,601	277,628	433,229
MORAZAN	40,000	102,712	142,712
LA UNION	65,000	227,987	292,987
T O T A L S	**2,640,800**	**2,734,245**	**5,375,045**

Source: MIPLAN Population Study and ANDA Planning Division's Physical Development Department Estimates.

TABLE No. II.4

EL SALVADOR POPULATION, PERIOD: 1986-1991

POPULATION	1986	1987	1988	1989	1990	1991
T O T A L	**4,845,588**	**4,933,835**	**5,031,483**	**5,137,707**	**5,251,678**	**5,375,045**
URBAN	2,259,982	2,302,127	2,348,907	2,397,768	2,468,289	2,640,800
RURAL	2,585,606	2,631,708	2,682,576	2,739,939	2,783,389	2,734,245

Source: MIPLAN Population Study and ANDA Planning Division's Physical Department Study Estimates.

Note that the population figures in Table No. II.3 do not reconcile with those developed by SRN in the conflictive municipalities, in part for the purpose of allocation of resources. The SRN figures are shown in Appendix A. This is of no particular concern in this report. The population figures in Appendix A are a current best estimate of a dynamic and shifting situation. The numbers in Appendix A are relatively correct in showing relationship between municipalities and are satisfactory for the purpose intended. Again, these figures should be verified or corrected by the census.

If the ANDA figures for population and population growth are accepted for purposes of demonstration, the costs shown in Table No. II.5 can be derived rather easily. These costs are conservative, since both population and population growth rate used by ANDA are less than the figures supplied by USAID/HPN. See Table No. II.6 for costs based on HPN estimates.

TABLE No. II.5

ANNUAL RATE OF EXPENDITURE
TO INCREASE RURAL WATER, INCLUDING MINIMUM SANITATION,
COVERAGE BY 5% PER YEAR
ASSUME 2.35% ANNUAL POPULATION INCREASE

YEAR	POPULATION IN RURAL AREAS	INCREASE FROM PREVIOUS YEAR	5% INCREASED COVERAGE	INVESTMENT FOR POPULATION INCREASE $	INVESTMENT FOR 5% GROWTH $	CUMULATIVE TOTAL INVESTMENT F/5% GROWTH $
1991	2,734,245					
1992	2,798,850	64,255	136,712	8,000,000	17,000,000	17,000,000
1993	2,864,623	65,773	139,943	8,200,000	17,400,000	34,400,000
1994	2,931,737	67,314	143,221	8,410,000	17,900,000	52,300,000
1995	3,000,633	68,896	146,507	8,610,000	18,300,000	70,600,000
1996	3,071,140	70,515	150,032	8,810,000	18,750,000	89,350,000
1997	3,143,320	72,172	153,557	9,000,000	19,190,000	108,540,000
1998	3,217,180	73,860	157,166	9,250,000	19,650,000	128,190,000
1999	3,292,792	75,604	160,859	9,450,000	20,100,000	148,290,000
2000	3,370,173	77,381	164,640	9,675,000	20,575,000	168,865,000
2001	3,449,372	79,199	168,509	9,900,000	21,100,000	189,965,000
TOTAL INVESTMENT TO GAIN ADDITIONAL 44.1%. RURAL WATER COVERAGE IN 10 YEARS: $190,000,000						

* Note that this assumes equal growth rates in rural and urban populations which may or may not hold.

TABLE No. II.6

INVESTMENT REQUIRED IN RURAL WATER SUPPLY/SANITATION
BASED ON POPULATION AND POPULATION GROWTH FIGURES
EXTRAPOLATED FROM 1992 POPULATION DATE PROVIDED
BY USAID HEALTH, POPULATION, AND NUTRITION OFFICE
TARGET 5% INCREASE IN COVERAGE EACH YEAR

YEAR	ESTIMATED RURAL POPULATION	POPULATION INCREASE @ 2.932 %	5% OF POPULATION INCREASED COVERAGE	INVESTMENT FOR POPULATION INCREASE $000	INVESTMENT FOR 5% GROWTH $000	CUMULATIVE FOR 5% GROWTH ANNUALLY 1992 $000
1992	2,854,902					
1993	2,938,607	83,705	146,930	10,400	18,400	18,400
1994	3,024,767	86,160	151,238	10,800	18,900	37,300
1995	3,113,453	88,686	155,673	11,100	19,500	56,800
1996	3,204,740	91,287	160,237	11,400	20,030	76,800
1997	3,298,703	93,963	164,935	11,700	20,600	97,400
1998	3,395,421	96,718	169,771	12,100	21,200	118,600
1999	3,494,974	102,473	179,872	12,800	22,500	162,900
2000	3,597,447	105,477	185,146	13,200	23,100	186,000
2001	3,011,494	108,570	190,575	13,570	23,800	209,800
INCREASED COVERAGE BY 44% AT A COST OF $210,000,000, RURAL ONLY						

Other possible investment strategies with their annual and cumulative costs are show in tables in Appendix M.

The costs demonstrated in Tables Nos. II.5 and II.6 above will vary with rural-urban population distribution, inflation, actual population growth rate, and level of service provided, but they are a reasonable estimate for evaluating the magnitude of the problem. And they show that in any year in which less than $8,000,000 is spent on new or expanded rural water systems the number of additional people served will be less than the increase in rural population.

Since these costs cover rural populations only, the total national investment in the potable water/sanitation sector must be high if significant percentage of services coverage are to be obtained. Compared to investments being implemented or sought for electric power, however, requirements in the water supply sub-sector are relatively small.

The absolute numbers of additional rural persons for whom water service is provided may be relatively large, and the service will be critical in the lives of those persons, but the percentage of the population for whom water is provided may remain discouragingly small.

The investment figures above do not include annual costs for maintenance, the cost of which should be recovered by charging users for water consumed. Improved maintenance organization, management and funding are absolutely vital to improved rural water supply systems and increased permanent coverage of the rural population.

ANDA is rehabilitating its existing systems with funding from the IDB. The initial estimates for construction of the first 38 systems show an average cost for the water supply component only of $25.00 per capita. This estimates is believed to represent about 20% of the average per capita cost to plan, engineer and build completely new rural systems and provide limited sanitary facilities. Note that approximately $125 per capita is being invested to improve the already large system of San Salvador to serve approximately 25% of the population of the nation. A similar or higher level of investment per capita is being discussed for Sonsonate.

D. TECHNICAL ASSISTANCE AND FUNDING FOR LARGE MEA PROJECTS

1. Existing Municipal Water Systems

As noted above there are 38 municipally owned water systems in municipal towns of the ex-conflictive zone. Little is known of the overall condition of most of these systems, nor of present reliability and adequacy of system components. It is reasonable to believe, however, that they are in no better condition than ANDA systems for which major overhaul and expansions are being funded by IDB. Studies of these municipal systems should be undertaken to determine any deficiencies in them, and to devise improvements and repairs which may be needed to correct those deficiencies if such are found. None of the existing water supply programs that have been identified address the water supply and sanitation problems of these municipal towns, although possible work on at least some of them can be done under existing projects.

Engineering studies of each system should be performed by a Salvadoran engineering firm with special expertise in water supply and sanitation or by adding them to the tasks of LBII. If a new contract is to be awarded by a GOES agency, the DGR could act for CONARA and the mayors in preparing the contract documents and selecting the contractor, since DGR has broad experience in award and administration of engineering services contracts. DGR might administer the contract(s) directly or give technical assistance to the mayors in engineering services contract administration.

Each of the 38 municipalities should be studied at no charge to the municipality, provided the mayor agrees to accept the offer of the service. For each site, the contractor should determine (1) present water supply source, (2) condition of existing system, (3) suitability of present source and any improvements required, (4) recommended system repairs, improvements and expansions, (5) estimated cost of the recommended work, (6) existing and recommended improvements in sanitation facilities or systems, (7) total population to be served. If so tasked by the mayor and/or DGR, and funded by the project, the firm should prepare final construction drawings and specifications.

Funds for construction should be made available to the municipalities in addition to the regular CONARA/MEA program, and should not be charged against the annual local currency allocations to the municipalities. Funds could be provided under a soft loan program using re-flow from the earthquake project, or might be funded as a grant using infrastructure funds from Project No. 394 and/or Project No. 320.

Relatively major (for a municipality) infrastructure projects of this type often are too large for funding under the normal MEA project lists developed in open meeting because, it is reported by CONARA field personnel, mayors often are reluctant to consider them because of the cost. And water is so basic to the welfare of people in the municipality that it merits a separate funding source which complements the regular MEA program.

This program for municipal towns should not replace the regular MEA sub-projects for small water systems or water supply sub-projects as they may be developed in the open town meetings.

2. Potential New Systems in Municipal Towns

There are eight municipal towns in the ex-conflictive zone reported by ANDA to be without water systems. Prefeasibility studies for these eight towns should be performed to determine what, if anything should be constructed to assure a dependable supply of potable water.

The approach to this problem should be similar to that described in (1) above, although a different contractor may be used. Systems could be financed by grant or by soft loan depending on circumstances in the municipalities and availability of funds. Technical assistance should be offered to each municipality to prepare the studies and preparation of contract documents, including final design and specifications where required, at no cost to the municipality and in addition to all other funding that may be provided under the MEA/CONARA program.

3. Caminos Vecinales

According to charts published by MOP/Caminos there is a total of 2,693 Km. of caminos vecinales, or neighborhood roads, under jurisdiction of the municipalities in all of El Salvador. Given 262 municipalities, that represents an average of only a little over 10 Km. per municipality.

In driving the roads of representative municipalities, one develops a concern that those figures may be low, and that the magnitude of the job to be done restoring and improving municipal roads probably has been underestimated. There has been no recent nationwide inventory of such roads, however. It is known that some routes shown as foot and horse paths on maps have been expanded to carry vehicular traffic, at least in the dry season. See Appendix R.

An inventory similar to that done on the national network by Louis Berger International, Inc. and DGC is indicated. Bridge conditions and needs should be included. Some vecinales roads have been found by field inspection to be impassable. Such roads should be included.

An initial inventory could be done quickly by the mayors of the municipalities with technical assistance and monitoring by CONARA representatives to help assure reasonable accuracy. Additional highly skilled engineering advice could be provided by temporary employees of LBII who have worked on the national survey, if desired. There is some indication of inconsistency among mayors as to classification of roads as caminos vecinales, Rural "A", Rural "B", etc. Some coordination with DGC and LBII to define precisely how caminos vecinales are defined and the ones for which the mayor is responsible is required.

Special attention should be paid to a realistic statement of stream crossings and bridge needs. From the number of new small bridges now seen to be under construction or requested by the municipalities, some on the national network, it is concluded that the need and total cost of small bridges has been underestimated. A number of stream and river crossings has been inspected where no bridges exist. As the economy comes to depend more on vehicle transport, the need for bridges becomes critical. The major crossings should be built under Caminos or direct AID contract in an effort to assure that all design parameters are considered. Not all crossings must be bridges now; however. In some places, paved fords or low water slabs could serve for several years with only relatively minor delays at intervals during the rainy season.

Construction and reconstruction of single stretches of road from the municipal town to the cantons, between cantons and from cantons to caserios in many cases will cost more than the annual allocation to the municipality under the regular MEA funding

program. These roads which are totally within one municipality and cost more than the municipality can afford at present are sometimes repaired by volunteer labor of people who live along the road, but this type of work without professional supervision seldom results in lasting improvements. Roads between municipal towns normally are a part of the DGC national net, but it may be necessary for SRN/CONARA and Project 394 to fund critical stretches; in some cases, mayors may have do the work.

The primary problem in all roads, especially unpaved rural roads, is drainage and that problem seldom is addressed properly unless the work is done under professional, or at least well experienced, supervision. Appendix Q discusses briefly the problem of drainage on dirt and gravel roads. Drainage is the number one quality control problem on rural roads. In any technical assistance program to develop road maintenance capability, special emphasis should be placed on organization and funding for maintenance of lower class, primarily dirt, rural roads.

Like municipal water systems, long sections of rural roads can be more quickly restored if funds over and above the normal MEA/CONARA funding levels are set aside specifically and allocated to the municipalities for work on caminos vecinales, and possibly DGC/Caminos low class roads, outside the municipal and canton towns. Good work is being done in the towns now under existing procedures, and short pieces of the worst sections of rural road are being upgraded with permanent construction.

Limited money for some of the larger sub-projects on lesser roads might be made available in Project No. 394, and once the program is established and shown to be working effectively it should prove attractive to other donors. It should be possible to provide technical assistance to CONARA and the municipalities under Project No.394 if that becomes necessary.

4. Flooding Damage to Roads

Drainage and inundation is seen to be a severe problem as it affects roads between the mountains and the sea. This phenomenon has been observed in parts of the southern region of the country. Heavy runoff of rainfall coming off the mountains carries a load of mud, stone, and silt that results from erosion on the mountain sides. Drainage ditches are not adequate to carry the flow without damage to roads, agriculture, and housing; and such ditches as exist often are plugged when water slows down on the flat land and the load carried by the swift current drops out. Ultimately, some study of this problem should be carried out, at least in Usulután, San Miguel, La Paz and San Vicente. That is beyond the scope of the current USAID project, but is mentioned here in order to record the problem with the hope that other donors may study it in depth in the not too distant future.

E. IMPLEMENTATION

From a study of the types of sub-projects to be undertaken under Project 394 and its contributing projects, and of the implementing agencies for infrastructure, the author of this report has arrived at certain conclusions concerning implementation for roads, bridges, and water/sanitation sub-projects. Those conclusions are presented here for consideration.

1. Rural Roads Sub-projects

(a) Caminos roads on the national road network. Sub-projects are being implemented now by DGC under an IDB project and USAID Project No. 320. There is no reason to change procedures or construction schedules established by DGC with technical assistance. This phase of reconstruction, presently funded, will proceed. However, Caminos appears to be stretched to the limit except in the award of contracts for bridges. The Department Residents, if properly funded, should have capacity now for improved maintenance, however, and may be an underutilized resource.

(b) Caminos vecinales, or neighborhood roads, are being repaired on a relatively small scale by the municipalities. This program should continue, but a number of sub-projects larger than those customarily awarded are indicated. In fact, the municipalities are working on Caminos Rural "B" roads now, and it may be necessary to increase this element to make the roads passable in all weather until such time as Caminos can rebuild them. As many as possible of the low level road sub-projects should be done by the municipalities, with additional funds earmarked for road and bridge repair. Longer stretches of road especially between municipalities, and longer bridges could be assigned to DGC/Caminos on a project-by-project basis.

2. Water Sanitation

Water and sanitation systems are deficient throughout the ex-conflictive zone. ANDA has a program underway to repair and improve existing ANDA systems in ex-conflictive municipalities. It is assumed that project will run its course in due time. In the meantime, the municipalities may choose to build extensions onto ANDA systems. This they should be permitted, or even encouraged, to do with ANDA advice, agreement or assistance.

In the municipalities which operate their own systems, or where no systems exist, technical assistance should determine the type, extent, and construction details of improvements to existing systems and for construction of new systems. All of this construction should be contracted and administered by the municipalities, with technical assistance if necessary. Additional funds set apart especially for water system improvements and new

construction would permit major construction where necessary without taking funds from the routine CONARA/MEA program.

Sanitation facilities must be included with all water improvement projects. Limited, if any, resources in addition to Project 320 are expected to be available for sub-projects devoted solely to sanitation.

III. ASSESSMENT AND SUB-PROJECTS

A. GENERAL

Sub-projects listed here are for the purpose of showing examples of reconstruction work that is needed and is not already planned or programmed by existing implementing agencies in the field. The sub-projects are confined to the ex-conflictive municipalities. The sub-project lists are based on the best information available, but are not presented as a complete identification of all needs, nor as fixed. Work to be done over the next five years will vary from these lists beyond a doubt as more is learned about conditions in the countryside and as the amount of resources actually made available by donors becomes known. The sub-project lists shown in the Appendices reflect real requirements, but none of them show all the requirements of any sub-sector.

Sub-projects are listed in two categories for rural roads, bridges, and water/sanitation. The two categories are (1) studies and engineering, and (2) actual construction sub-projects, or potential and probable sub-projects, that have been identified to date. Sub-projects under the MEA program are not identified. A great number of relatively small sub-projects should and will be undertaken under the MEA/CONARA program, but they will be identified by the mayors or by an inventory-study of vecinales and stream crossings as recommended in this report.

B. SUB-SECTOR PRIORITIES

Inspection tours of representative municipalities in several departments make it quite clear that total needs in the countryside have been underreported and under estimated in the PRN, and in reconstruction plans of both Caminos and ANDA.

If the objective to be achieved during the reconstruction period is social, economic and political integration of the rural areas into the national main stream, the resources available to date are not adequate to the task. This fact is well known, so one should not expect that all needs will be met until other donors begin to participate.

It is therefore extremely difficult to assess priority needs, since so much is needed in so many municipalities in so many sub-sectors at the same time. Nevertheless, in general terms priorities among sub-sectors are suggested as below in Table No. III.1. There are potentially hundreds of individual sub-projects in each sub-sector, and only representative samples of some of them are given later in this section. As noted elsewhere, more extensive, although not complete, lists are shown in the Appendices.

TABLE No. III.1

PRIORITY WITHIN SUB-SECTORS
OF WATER SUPPLY/SANITATION, RURAL ROADS AND BRIDGES
IN THE EX-CONFLICTIVE ZONE

PRIORITY	TYPE OF SUB-PROJECT
1.	Municipal Water Systems in 38 Municipal Urban Areas; Study and Engineering, Possible Construction.
2.	Municipal Water Supply in 8 Municipal Towns without Water Systems; Study and Engineering, Possible Construction.
3.	Rural Water Supply as Scheduled under Project No. 320.
4.	Repair of other existing inoperative or damaged water systems, including a part of 119 systems installed by PLANSABAR.
5.	Rural Roads as Scheduled under Project No. 320, and as may be added to the Project. Development of maintenance capability by DGC department residents is critical.
6.	Caminos Vecinales, Rural "A" and Rural "B" and Tertiary Roads in 115 Municipalities.
7.	Bridges and Stream Crossings on Caminos Vecinales, Tertiary, Rural "A" and Rural "B" Roads. Small bridges to be implemented by mayors with technical assistance of CONARA and others, including DGC, as needed.
8.	Bridges on all Rural Roads where bridges are too large or technically difficult for the mayors, to be implemented by Caminos.
9.	Other Rural Roads and Bridges on the National Network not included in any of the above.

These general priorities were determined after touring and inspecting conditions in several municipalities and departments observing the present and evaluating probable future needs and capabilities of municipalities, ANDA, DGC, and PLANSABAR. Work should go forward simultaneously in all sub-sectors, but Table III.1 should indicate relative importance if conflicting claims are made for the same resources.

C. INSTITUTIONAL ASSESSMENT AND ALLOCATION OF RESOURCES

It is observed that both MOP/DGC and ANDA are planning and trying to execute their programs independently on a national scale, with certain emphasis in the ex-conflictive zone. A determination to execute a full scale reconstruction program to meet the needs of the municipalities in the ex-conflictive zone in the shortest possible time by diversion and concentration of resources is not observed.

The SRN, rightly concerned with social and political aspects of the PRN, exercises little if any coordination or directive functions with DGC or ANDA. Most all infrastructure planning and execution under direct auspices of SRN are exercised through CONARA support and funding of work done by the mayors. The work done under the CONARA/MEA program is very important, but the real objective of MEA is to develop local government, and the small infrastructure projects are a means to that end.

To meet the total needs of the rural and municipal people, a greater effort is needed to devote more funds for larger projects to be implemented at the local level, and if necessary to provide technical assistance in engineering and construction administration and supervision if requested by the mayors.

To do this, additional resources from Project 394, and other donors in the future it is hoped, will be needed to establish at least two special funds which can be drawn down by the mayors to implement larger, properly engineered, projects. These special funds would be:

(1) Solely for rural road and bridge rehabilitation and/or construction,

(2) Solely for water supply and sanitation systems, with emphasis on municipal towns, and repair of existing systems.

Most of the mayors are deemed to have the capacity to handle projects and funding of this type, based on performance to date.

If the project funds for roads and water are jointly managed by SRN and USAID, there is no apparent reason why it could not be used to finance specific road and bridge sub-projects executed by DGC/Caminos when they are beyond the capacity of the municipality. In fact, the possibility of funding of force account work on projects by Caminos department residents in support of municipal programs could be investigated under the mechanism once it is established. There is at least limited precedent for CONARA funding of work performed by Caminos.

And working through the Caminos residents would permit heavy maintenance of short stretches or spots of roads when full

rehabilitation or reconstruction is not required and the only source of funds is the SRN. A number of such short stretches of road have been observed when that approach would be the most economical way to keep roads passable.

It is doubtful that similar approaches would be successful in trying to work with ANDA on water systems at this point time. In theory, ANDA should have regional offices that could perform maintenance and minor construction funded by others, but the capability has not yet been demonstrated. If the ANDA regional shops develop, they could become a source of help but should not be relied upon.

If PLANSABAR becomes an autonomous agency, independent of the Ministry of Health, as IDB is reported to have demanded as a condition for further funding, then PLANSABAR might become a source of help to the mayors. But that, too, is yet to develop and cannot be relied upon.

In municipal water supply, it will be necessary for the mayors to award the contracts unless it is done by DGR or by direct USAID contract. DGR has vast experience in contract award and administration, and has done a number of water and sanitation projects. It is suggested that DGR could be utilized for any major water supply/sanitation projects in the municipal towns because of the number and type of technical and contract administration problems potentially involved.

D. RURAL ROADS SUB-PROJECTS (UNPAVED SECONDARY, TERTIARY ROADS AND LOWER)

1. Studies

a. Inventory caminos vecinales; preferably nationwide but, as a minimum and as a first step, in the 115 ex-conflictive municipalities:

A method for performing the inventory and inventory form for reporting each stretch of municipal rural road in the municipality, other than inside the municipal and canton towns, is shown in Appendix O.

Estimated cost for rationalizing, verifying and computerizing data: $150,000.00.

b. Inventory and evaluation of stream crossing requirements and proposed bridges, with emphasis on those requested by mayors. There may be as many as 150 stream crossings on existing roads where bridges have been destroyed or never existed. Each is a problem to a segment of the rural population and there have been requests from all over the country for help in solving the problem. Each crossing should be evaluated, and a solution, if

feasible, proposed. Until preliminary estimates of bridge and stream crossing needs are submitted by the mayors, and possibly supplemented by DGC/Caminos and CONARA, any estimate of cost of this inventory and evaluation would be conjecture.

2. Construction, Roads Sub-projects

The DGC has proposed a four year reconstruction program as shown in Appendix D. The program includes 108 sub-projects and total 899 Km of tertiary, Rural "A" and Rural "B" roads, at a total cost of $17,083,880. This program proposes sub-projects in eleven of the twelve ex-conflictive departments. No work is proposed for Morazán in the DGC plan.

The rural roads section of the PRN is not broken into sub-projects, but calls for a total of 1,204.11 Km of road in eleven departments (excludes Morazán) at a cost of $22,984,960.

Both Caminos and the PRN proposals are found by field inspection to be deficient.

Some road sub-projects, representative of what the mayors might undertake and which are badly needed are shown below in Table No. III.2, although those municipalities might choose other sub-projects as higher priority. A sample of bridge sub-projects is shown in Table No. III.3. There appears to be a need for about 120 bridges on tertiary and lesser roads that will vary from 5 to 50 meters in length. The inventory is still in progress. Additional sub-projects will be developed in the future as a result of an inventory of caminos vecinales and bridges and from the potential sub-project lists in the Appendices. Project goals should be set at completion of 400 Km. of road and 500 meters of bridges on neighborhood roads and lesser Caminos roads for each year of the project. Cost of this level effort, when managed by existing staff in both USAID and GOES would be approximately $10,500,000 per year for a four year program for roads and bridges.

These funds should be dedicated to road and bridge work. some of the funds currently allocated for infrastructure projects in MEA/CONARA program might have to be used to supplement these funds because of shortfalls in Project 394 infrastructure funding.

In a report of 6 January, 1992, LBII submitted to DGC a list of rural roads shown by the national road inventory to be in need of "Rehabilitation/Reconstruction". In the ex-conflictive zone the total length of tertiary, Rural"A" and Rural "B" roads was 1,683 kilometers. The entire document is shown in Appendix U. This is almost double the total of the DGC reconstruction plan shown in Appendix D. And the DGC includes a number of roads not included in the LBII report, and field inspection of some of them shows the need to be justified.

When the two lists are combined, the need for reconstruction of these classes of road will be approximately 2,000 kilometers.

TABLE III.2

MUNICIPAL ROADS
REPRESENTATIVE SUB-PROJECTS
WHICH COULD BE BEGUN QUICKLY BY MUNICIPALITIES

Roads No.	**Department/Municipality** Name of Sub-Project	Length Km.	Cost $000
	Santa Ana-Texistepeque		
1.	North for Guarnecia to connect with road between C/La Ruda & C/San Salvador	8	160
2.	From road in 1 above to Río Lempa	6	120
3.	From CA:12 at Texistepeque to Río Guajoyo north of C/San Miguel. (Road to M/San Antonio Pajonal)	8	110
	Santa Ana-Masahuat		
4.	From CA:12 to Río Lempa-Road to Masahuat	6	110,000
	Chalatenango-Nueva Concepción		
5.	Potrero Sula to Las Tablas to Río Lempa	16	230
	San Salvador		
6.	Nejapa-Apopa C/Camotepeque to Río Acelhuate to Tres Ceibas	4	80
7.	Nejapa C/Camotepeque to C/Bonete to Río Acelhuate	6	112
	Cuscatlán-Suchitoto		
8.	Repair or reconstruction of caminos vecinales in 8 of 11 cantons.	25	470

Under another scenario, repair, improvement, and reopening of caminos vecinales, neighborhood roads, is of such universal need and so much needs to be done at the same time that each municipality could be a separate sub-project in its own right. It is suggested that this strategy should be strongly considered. Much of the work to be done will be improved drainage, and technical assistance may be required if CONARA does not now have the capability.

If an inventory of caminos vecinales is completed in the near future, the magnitude of the task in each of the 115 municipalities can be more precisely determined, and each municipality funded as a sub-project, with the objective of rebuilding caminos vecinales plus Rural"A" and Rural "B" roads during a four or five year period. Progress should be monitored on the basis of kilometers completed per year in each municipality.

(Concurrently, it will be essential that a source of municipal funds for future road maintenance be institutionalized. If a fair share of gasoline taxes were allocated to each municipality on the basis of some formula to be determined, the problem could be partially solved.)

The caminos vecinales of each municipality could be established as a sub-project under management of the mayors, and funded incrementally as pre-determined segments are completed.

Under this methodology, there are automatically 115 road sub-projects, with priorities established by how hard municipalities are willing to work to repair their own roads.

E. BRIDGES AND STREAM CROSSINGS

As noted in III.D.1 above, a study and technical evaluation of stream crossings on tertiary, Rural "A", Rural "B", and municipal roads should be undertaken to determine the magnitude of the problem and the best technical solution for each location. On some larger streams and heavily travelled roads, bridges; on lesser roads, paved fords or low water slabs poured over concrete or corrugated metal drain pipes will serve satisfactorily for many years at some stream crossings.

Bridge reconstruction included in the NRP is shown in Appendix F. Bridges proposed by DGC for a four year reconstruction plan are in Appendix G. Neither of these plans address the total needs in the countryside on lesser rural roads. The NRP proposes 577.55 meters of bridges at 24 sites at a cost of $4,783,000. some of them are in municipalities not now classified as being in the ex-conflictive zone. Some of them are Bailey bridges which should remain in place for a few more years until more of the lesser bridges are built. In the DGC bridge plan, only eleven bridges are judged suitable for funding under Project 594. These eleven bridges total 303.45 meters, estimated to cost $1,964,000. It does not address bridges on caminos vecinales. They are in only six of twelve departments.

Some potential bridge-stream crossing sub-projects that have been identified by field inspection and by discussion with CONARA field personnel are shown in Table No. III.3. This list must be expanded after completion of the study-inventory recommended. Further technical study and traffic analysis may juggle the priorities and timing for construction of some of those sub-projects, but the

local population and economy need dependable stream crossings, even if they are closed a few days a year by high water.

TABLE No. III.3

BRIDGES AND STREAM CROSSINGS
REPRESENTATIVE OF REQUIREMENTS

[These sites were identified on a relatively few field trips to a relatively few municipalities in most departments. It is not, therefore, an exhaustive list, but representative of what would be found on an inventory and evaluation of stream crossing, especially on tertiary and lower roads, but in a few cases on higher class roads. The tabulation gives a qualitative indication of how badly the problem has been underestimated.]

Department/ Municipality	Location or Bridge/Stream Name	Probable Type	Estimated Length Meters	Budget Cost $000 (Preliminary)
Usulután				
San Agustín	CA:2 to San Agustín	B	12	65
Santa Ana				
Santa Rosa Guachipilín	CA:3 across Río Lempa	B	50 ?	375
Texistepeque	Texistepeque to San Antonio Pajonal across Río Guajoyo	B	40	300
Santa Rosa Guachipilín	Locations not specified by mayor - 10 bridges		300 ?	---
Texistepeque	Texistepeque to Ctn. San Miguel 3 crossings	S		
Masahuat	Masahuat to Las Piedras across Río Lempa	B-S	140	275
Santa Ana-Chalatenango				
Texistepeque-Nueva Concepción	Guarnecia to Potrero Sula across Río Lempa	B	50	400
Chalatenango				
Nueva Concepción	Potrero Sula to Río Lempa across tributary of Río El Anatal	B	30	175
La Reina	La Reina to El Tigre across Río Talquezalapa	B	30	200
Santa Rita	CA:3 to Santa Rita across tributary not named on map	B	40	240

Department/ Municipality	Location or Bridge/Stream Name	Probable Type	Estimated Length Meters	Budget Cost $000 (Preliminary)
Chalatenango	Chalatenango to San Francisco Lempa - Unnamed tributary	B	50	300
Chalatenango	Chalatenango to Guarjila and San Antonio Los Ranchos	B-S	40	480
Chalatenango	Up to 10 (more) crossings of undetermined length			
Cuscatlán				
Tenancingo	3 locations not specified by mayor			
Suchitoto	5 locations not specified by mayor			
San Miguel				
Sesori	7 bridges of various lengths			
San Gerardo	Over Quebrada El Pito			
Chapeltique	2 bridges of unspecified length			
Morazán				
San Francisco Gotera	1 bridge of unspecified length			
Sociedad	7 bridges of unspecified length			
Arambala	1 bridge of unspecified length			
Cacaopera	1 bridge of unspecified length			
Corinto	8 bridges of unspecified length			
Sensembra	3 bridges of unspecified length			
San Salvador				
Tonacatepeque	1 bridge of undetermined length			
Aguilares	9 bridges of undetermined length			
El Paisnal	4 bridges of undetermined length			
Nejapa	4 bridges of undetermined length			
Apopa	2 bridges of undetermined length			
La Libertad				
San Matias	1 bridge of undetermined length			
San Juan Opico	1 bridge of undetermined length			

Crossings in a limited number of departments and municipalities, identified by mayors, partial

Total to date: 92

As of this date, some departments and municipalities have not supplied data.

Note: Several mayors in the non-conflict areas have also expressed a strong need for up to 11 bridges in the municipality.

Note 2: If average length of these 92 crossings were 20 meters and all are bridges, probable cost is about $16,000,000.

F. WATER SUPPLY AND SANITATION

Study, repair, new construction or expansion of both water and sanitation facilities are potentially required in forty-six municipal towns which are not served by ANDA systems in the ex-conflictive zone. The number of new or improved systems needed in the cantons and caserios is extreme and work accomplished will be limited only by the rate sub-projects can be identified by MOH and built by ANDA, PLANSABAR, NGOs, or the municipalities under existing or future projects.

1. Studies

a. Condition and required improvements in 38 municipal towns where systems are owned by the municipality. Work to be performed by a local engineering firm. Estimated cost: $300,000. Work could be done by LBII at option of the Mission.

b. Evaluate eight municipal towns where there is no, or only a rudimentary, water system. Work to be done by a local engineering firm, who should perform final design of any systems selected for construction. Estimated cost: $160,000.

c. Study condition of existing PLANSABAR systems for which mayors have requested repair and/or expansion Up to 119 systems; 73 in the ex-conflictive zone. See Appendix J.

2. Construction Sub-projects, Water Supply and Sanitation

Potential water supply/sanitation sub-projects in thirty eight municipal towns which have municipally owned systems are shown in Table III.4. Actual priorities should be established after completion of the preliminary engineering report for each town.

Potential water supply/sanitation sub-projects in eight municipal towns reported to be without water systems are shown in Table III.5. As above, preliminary engineering reports for each municipality should identify seriousness of problems, and permit

setting of priorities rationally.

There are a number of PLANSABAR systems in the cantons and caserios; by PLANSABAR Report, 286 nation wide. Appendix O shows the rural water sections of the NRP. Appendices J and K show the location and status of PLANSABAR systems in the ex-conflictive zone, and potential sub-projects.

TABLE III.4

MUNICIPALITY OWNED WATER SUPPLY SYSTEMS
IN EX-CONFLICTIVE ZONE
ESTIMATED COST OF REHABILITATION AND IMPROVEMENT

Department/ Municipality	Estimated Population of Municipality/ Town	Estimated Cost of Water Supply/ Sanitation Sub-Project 000$
Cabañas		
Cinquera	2,100	130
Guacotecti	1,600	100
Villa Dolores	3,500	225
Total, Cabañas		**455**
Cuscatlán		
None	---	---
Chalatenango		
Citalá	2,200	140
El Carrizal	1,200	75
Las Vueltas	1,900	120
Nombre de Jesús	2,500	160
San José Las Flores	2,000	120
Nueva Trinidad	3,000	180
San Antonio de La Cruz	1,500	95
San Ignacio	2,700	165
San Isidro Labrador	1,300	80
San Francisco Morazán	1,900	120
Total, Chalatenango		**1,255**

Table III.4 continued

Department/ Municipality	Estimated Population of Municipality/ Town	Estimated Cost of Water Supply/ Sanitation Sub-Project 000$
La Libertad		
None	---	---
La Paz		
None	---	---
La Unión		
Lislique	5,100	320
Polorós	5,000	315
Total, La Unión		**635**
Morazán		
Arambala	1,500	95
Corinto	6,700	410
Cacaopera	7,000	440
Delicias de Concepción	2,200	135
Guatajiagua	5,000	315
Gualococti	1,400	90
Meanguera	3,800	235
Oscicala	3,100	195
San Fernando	800	50
San Isidro	910	55
San Simón	2,800	175
Torola	2,800	175
Yamabal	1,900	120
Yoloaiquín	1,600	100
El Rosario	1,400	90
Sociedad	6,500	405
Total, Morazán		**3,085**

Table III.4 continued

Department/ Municipality	Estimated Population of Municipality/ Town	Estimated Cost of Water Supply/ Sanitation Sub-Project 000$
Santa Ana		
None	---	---
San Miguel		
Ciudad Barrios	8,000	500
Chapeltique	5,100	320
Nuevo Edén de San Juan	3,800	235
San Luis de La Reina	3,600	230
San Antonio El Mosco	2,500	155
Total, San Miguel		**1,440**
San Salvador		
El Paisnal	5,800	365
Total, San Salvador		**365**
San Vicente		
None	---	---
Usulután		
San Agustin	7,600	475
Total, Usulután		**475**
Grand Total, 38 Municipal Towns; Urban		**7,710**

This assumes 35% of each municipality lives in the municipal town. To the extent that percentage varies, the individual line items will vary. The cost can also go up or down depending on the extent and type of sanitary facilities included in each sub-project; $7,500,000 probably is a fairly accurate estimate of total costs for the 36 communities.

TABLE III.5

MUNICIPAL CITIES WITHOUT WATER SYSTEMS
IN EX-CONFLICTIVE ZONES
ESTIMATED COST OF ESSENTIAL WATER AND SANITATION IMPROVEMENTS

Department/ Municipality	Estimated Population of Municipality/ Town	Estimated Cost of Minimum Water /Sanitation Sub Project 000$
Cuscatlán		
El Rosario	600	75
La Libertad		
San Pedro Tacachico	7,100	890
La Unión		
Sauce	4,900	620
Morazán		
Joateca	2,300	290
San Vicente		
San Ildefonso	4,500	570
Usulután		
Ereguayquin	2,800	350
San Dionisio	1,700	205
San Francisco Javier	3,800	480
Total, New Systems, 8 Municipalities		**3,480**

Estimates based on 35% of population living in municipal towns, which is approximately the same as that in 30 towns with existing ANDA systems in the ex-conflictive zone. Those are the ANDA systems scheduled for renovation under the current IDB project.

IV. CONCLUSIONS AND RECOMMENDATIONS

A. CONCLUSIONS

1. There are 38 existing municipal water systems which should be studied to determine their condition and the type and extent of improvements or repairs needed in order for them to serve current and projected populations.

2. There are eight municipal water systems which are reported to have no water system.

3. At least seventy-three of PLANSABAR water systems in the ex-conflictive zone are in need of renovation and repair. That number is in addition to the fifty-two systems PLANSABAR has turned over to Project 320 for repair.

4. The total length of caminos vecinales, or neighborhood roads, in the ex-conflictive municipalities currently probably is under reported. The total reconstruction requirement thus has been underestimated. The need for rehabilitation or improvement of roads exists in every municipality.

5. The number of bridges and stream crossings required to provide all season access to markets and employment for people in the countryside has not been estimated as a part of the reconstruction plan.

6. The municipalities are proving the most effect implementing agency for projects in the rural areas, but may be reaching a limit in the size of projects they should attempt to administer and control without greater specialized technical assistance. In any event, as projects get larger project funding agencies must intensify quality control measures and daily inspection of contractors.

7. A number of sub-projects have been identified upon which steps to initiate implementation could be taken now.

8. Programs for reconstruction in ex-conflictive municipalities should be initiated as shown in Table IV.1. The four year time frame is arbitrary and was selected to coincide with the approximate time remaining for execution of the national reconstruction plan. A great backlog of badly needed reconstruction sub-projects will remain at the end of the period.

TABLE IV.1

ANNUAL FUNDING AND ANNUAL TARGETS
FOR FOUR YEAR PROGRAM TO CONSTRUCT/RECONSTRUCT
RURAL ROADS, BRIDGES, AND WATER/SANITATION SYSTEMS
IN THE EX-CONFLICTIVE ZONE

Sub-Project	New Funding Annual Cost Project No. 394 and Other Donors $	Annual Target for 4 Year Program
Rural Roads, Tertiary and below	7,500,000	400 Km/year of road
Bridges and Stream Crossings	3,000,000	500 meters per year of bridges of various lengths
Municipal Water	2,750,000	11-12 towns per year
Rural Water	* None. Use existing funds. Project No. 320 and other donors	1.5% per year increased coverage of rural population

* The need is great, with several hundred cantons and caserios identified as needing new water supply systems, or renovation of existing systems. Unfortunately, indigenous institutions have not yet shown capacity to absorb funds beyond what is currently available.

A list of alternate project objectives, or targets, are shown in Appendix S.

B. RECOMMENDATIONS

1. It is recommended that studies and preliminary engineering reports from municipal water systems and stream crossings on lesser roads as described in Section III be initiated as soon as possible.

2. It is recommended that an inventory of caminos vecinales, neighborhood roads, be initiative, completed, verified and reconciled with DGC records in the immediate future.

3. It is recommended that additional funds be established for roads/bridges and for water/sanitation to be coordinated by SRN. SRN should assign sub-projects and allocate funds to the best qualified implementing agency; usually the municipality or DGC; for specific sub-projects.

4. It is recommended that funds described in 3. above be utilized to achieve annual construction targets in roads, bridges, and water/sanitation as set forth in Table IV.1 above.

EPILOGUE

The rural roads/bridges and water/sanitation components of the national infrastructure have suffered primarily from neglect during the twelve years of hostilities. The bad conditions of routes and systems can be attributed in part to overt hostile action. By far the worst conditions, with the exception of a few major bridges, however, are the result of neglect and lack of maintenance. And the results of neglect are insidious in that they are universal, presenting problems which must be attacked in all departments and every municipality simultaneously to restore nearly every lower class rural road, to assure reasonable access to potable water in a great majority of the cantons and caserios and to rehabilitate or construct water systems in many municipal towns.

One is impressed at once that the problems of lesser roads and water supply, while national in scope, are local problems. They will be solved most completely and satisfactorily at the local level. Central government agencies, involved with their own programs, will not have incentive, motivation, nor personnel to identify and solve the problems of each municipality and canton within a reasonable time frame. The local elected government has the incentive,and if provided with resources can muster the people. The value of decentralization of authority, responsibility, and control of resources is clearly demonstrated.

In summary, the strategy to look to the mayors to carry out as much of the reconstruction program as possible is correct. It is concluded that ways must be found for them to do larger projects and to take even more responsibility for restoration of services in their municipalities.

By this point in time, it should be possible to prepare an infrastructure plan for each municipality, to determine, for each municipality, a plan of action for the next five years and the resources required to implement the plan. The plan should reflect what is reasonably possible in a given time frame, assuming that funds are available. Just a wish list of projects will not constitute a plan.

It should be easiest to do this in roads, bridges, water and sanitation sub-sectors because these provide services universally needed regardless of other economic or social developments. Work under the municipal plans should be allocated to responsible agencies: municipality, local water committees, MOP/DGC-Caminos, ANDA, and, if applicable, to the department or department resident representatives.

To the extent that resources of outside donors become available to support master plans of the municipalities, they can be allocated

by the SRN to the appropriate implementing agencies for different segments of the plan. The mayors, as elected officials, should be able to assist the central agencies and directorates in obtaining funds, or should develop the ability to do so.

No one has greater motivation to solve local problems than local people. And they should be able to do the job with minimum overhead and other indirect costs. Any technical assistance to municipalities to increase their administrative planning, and construction management capabilities will be money well spent, especially if funding is forthcoming with which they can carry out their plans.

If the time is not right for this type of planning in all municipalities, it should be tried in a few of them in an attempt to develop a methodology and a model.

APPENDIX "A"

DEPARTMENTS AND MUNICIPALITIES IN EX-CONFLICTIVE ZONES

Santa Ana	Pop.
Masahuat	5,061
Santa Rosa Guachipilin	6,679
Texistepeque	22,866
Total	34,606
Chalatenango	
Agua Caliente	10,501
Arcatao	9,478
Chalatenango	30,190
Citalá	6,401
El Carrizal	3,496
La Laguna	5,106
La Palma	11,355
Las Vueltas	5,523
Nombre de Jesús	7,217
Nueva Concepción	31,730
Nueva Trinidad	8,403
Ojos de Agua	5,232
San Antonio de La Cruz	4,538
San Antonio Los Ranchos	2,702
San Francisco Morazán	5,426
San Fernando	2,989
San Ignacio	7,636
San Isidro Labrador	3,670
San José Cancasque	4,913
San José Las Flores	5,854
Total	172,448
La Libertad	
San Juan Opico	
San Matias	47,110
San Pablo Tacachico	6,650
Quezaltepeque	20,204
Total	42,554
	116,606
San Salvador	
Aguilares	
Apopa	17,398
El Paisnal	30,504
Guazapa	16,574
Nejapa	15,130
Tonacatepeque	21,210
Total	18,318
	119,134
Cuscatlán	
El Rosario	
Suchitoto	1,743
San José Guayabal	44,670
Tenancingo	13,290
Total	12,939
	72,650

La Paz	Pop.
Jerusalén	2,493
Mercedes La Ceiba	877
Paraiso de Osorio	2,639
San Pedro Nonualco	11,818
Santa Maria Ostuma	7,196
Santiago Nonualco	36,658
Total	61,683
Cabañas	
Cinquera	5,730
Guacotecti	4,597
Ilobasco	59,516
Jutiapa	13,977
San Isidro	12,359
Sensuntepeque	54,820
Tejutepeque	8,521
Villa Dolores	10,163
Villa Victoria	21,272
Total	190,963
San Vicente	
Apastepeque	22,306
Guadalupe	6,340
San Esteban Catarina	11,247
San Ildefonso	12,983
San Sebastian	21,415
Santa Clara	10,757
Tecoluca	35,310
Verapaz	7,381
Total	127,819
Usulután	
Alegria	12,266
Berlin	33,359
California	3,067
Concepción Batres	17,150
El Triunfo	6,419
Ereguayquin	8,881
Estanzuelas	13,639
Jiquilisco	61,040
Jucuapa	18,956
Jucuarán	27,640
Nueva Granada	7,859
San Agustin	21,883
San Dionisio	4,716
San Francisco Javier	10,944
Santa Elena	21,113
Santiago de Maria	20,255
Tecapán	10,194
Total	298,589

Morazán	Population
Arambala	5,120
Cacapera	20,093
Corinto	19,753
Delicias de Concepción	6,213
El Rosario	4,184
Gualococti	3,982
Guatajiagua	14,351
Joateca	6,615
Jocoaitique	8,330
Meanguera	10,869
Oscicala	8,799
Perquin	3,665
San Fernando	2,474
San Francisco Gotera	14,208
San Isidro	2,739
San Simón	8,032
Sensembra	4,438
Sociedad	10,738
Torolá	8,072
Yamabal	5,597
Yoloaiquin	4,668
Total	180,810
La Unión	
Anamorós	21,912
Concepción de Oriente	13,591
El Sauce	14,082
Lislique	14,764
Nueva Esparta	16,352
Polorós	14,636
Total	95,337
San Miguel	
Carolina	11,690
Chapeltique	14,747
Chinameca	30,741
Ciudad Barrios	22,873
Nuevo Edén de San Juan	10,873
San Antonio del Mosco	7,869
San Gerardo	14,342
San Jorge	13,598
San Luis La Reina	10,505
San Rafael Oriente	16,929
Sesori	22,414
Total	175,861
Total of Inhabitants in Municipalities	1,646,596
Source: SRH	

APPENDIX "B"

RURAL ROADS
IN EX-CONFLICTIVE DEPARTMENTS

National Road Network- MOP/Caminos					Municipality
Department	Tertiary	Rural "A"	Rural "B"	Total	Vecinales
Cabañas	123.66	57.9	366.85	548.41	236.40
Chalatenango	174.36	195.90	394.20	764.46	261.20
Cuscatlán	83.65	95.98	379.33	558.96	140.31
La Libertad	183.70	108.70	175.70	468.10	253.50
La Paz	103.24	130.60	494.60	728.44	91.90
La Unión	157.40	62.20	342.30	561.90	267.60
Morazán	125.50	22.90	250.85	399.25	68.35
San Miguel	111.50	302.89	270.20	684.59	44.64
San Salvador	62.15	96.70	258.10	416.95	72.70
San Vicente	152.40	79.15	244.00	475.55	121.40
Santa Ana	52.14	181.55	360.00	593.69	367.50
Usulután	153.80	207.20	383.70	744.70	177.30
Totals	**1,483.50**	**1,541.67**	**3,919.83**	**6,945.00**	**2,102.80**

APPENDIX "C"

TERTIARY, RURAL "A" AND RURAL "B" ROAD SUB-PROJECTS
IN THE EX-CONFLICTIVE ZONE
AS LISTED IN THE NATIONAL RECONSTRUCTION PLAN

Department	Tertiary		Rural "A" & "B"		Totals	
	Km.	$	Km.	$	Km.	$
Cabañas	40.5	835,300	101.16	1,905,150	141.66	2,740,450
Cuscatlán	13.0	268,200	136.70	2,567,060	149.70	2,835,260
Chalatenango	58.5	1,206,530	90.80	1,702,480	149.30	2,909,010
La Libertad	16.0	330,000	13.30	249,400	29.30	579,400
La Paz	--	--	75.50	1,415,850	75.50	1,415,850
La Unión	--	--	101.50	1,903,160	101.50	1,903,160
Morazán	--	--	--	--	--	--
Santa Ana	--	--	59.00	1,106,250	59.00	1,106,250
San Miguel	--	--	78.00	1,462,540	78.00	1,462,540
San Salvador	--	--	54.70	1,025,600	54.70	1,025,600
San Vicente	55.5	1,444,730	63.10	1,183,150	118.60	2,327,880
Usulután	27.0	556,900	219.85	4,122,660	246.85	4,679,560
	210.5	**4,341,660**	**993.61**	**18,643,300**	**1,204.11**	**22,984,960**
		$20,625/Km		**$18,763/Km**		--

xtracted from The National Reconstruction Plan, Volume IIIB-II, Infrastructure ector, Published March, 1992.

APPENDIX "D"
TABLE D.1

EXTRACTED FROM THE RECONSTRUCTION PLAN FOR
HIGHWAY REHABILITATION TO BE IMPLEMENTED PER YEAR
PREPARED BY MOP/CAMINOS
YEAR 1

TO SHOW SUB-PROJECTS ELIGIBLE FOR FUNDING UNDER PROJECT NO. 394

NO	NAME OF HIGHWAY	CATEGORY	LENGTH	INVEST.	DEPARTMENT
1	SAN JUAN OPICO-SAN PABLO TACACHICO	TERTIARY	13.00	268.10	LA LIBERTAD
2	SAN JUAN LOS PLANES-QUEZALTEPEQUE	RURAL	13.30	249.40	LA LIBERTAD
3	TEJUTLA-SAN FRANCISCO MORAZAN-SAN RAFAEL	TERTIARY	15.50	319.70	CHALATENANGO
4	PRESA 5 DE NOVIEMBRE-NOMBRE DE JESUS	TERTIARY	6.00	123.70	CHALATENANGO
5	LA REINA-CANTON EL PEPETO	RURAL	10.00	187.50	CHALATENANGO
6	CA:4-EL TUNEL-SAN JOSE SACARE-LA PALMA	RURAL	10.00	187.50	CHALATENANGO
7	GUAZAPA-QUEZALTEPEQUE	RURAL	18.00	337.50	SAN SALVADOR
8	SUCHITOTO-EMBALSE CERRON GRANDE	TERTIARY	3.00	61.90	CUSCATLAN
9	INTERCONNECTION (SUCHITOTO-CINQUERA)-TENANCINGO	TERTIARY	10.00	206.30	CUSCATLAN
10	R/(SAN MARTIN-SUCHITOTO-SAN RAFAEL LA BERMUDA-EL PAPATURRO)	RURAL	6.50	121.90	CUSCATLAN
11	SUCHITOTO-AGUACAYO-CONSOLACION-COLIMA	RURAL	17.00	318.80	CUSCATLAN
12	R/(SAN MARTIN-SUCHITOTO)-CANTON ICHANQUESO-OLD ROAD	RURAL	2.80	52.50	CUSCATLAN
13	MILINGO-ESTANZUELA-AGUACAYO	RURAL	5.00	93.80	CUSCATLAN
14	R/(SAN MARTIN/SUCHITOTO)-CANTON SAN ANTONIO-OLD ROAD	RURAL	2.00	41.30	CUSCATLAN
15	ILOBASCO-TEJUTEPEQUE-CINQUERA-L.D. CUSCATLAN	TERTIARY	22.50	464.10	CABANAS
16	VILLA VICTORIA-SAN ANTONIO-SAN PEDRO-EL PALOMAR	TERTIARY	18.00	371.20	CABANAS
17	VILLA DOLORES-CHAPELCORO-SENSUNTEPEQUE-AGUA ZARCA	RURAL	10.60	198.70	CABANAS
18	EL REMOLINO-EL SALAMO-PRESA 5 DE NOVIEMBRE	RURAL	18.00	337.50	CABANAS
19	R/(L.D. ILOBASCO)-SAN JOSE HANASTEPEQUE-LOMAS DE PENA	RURAL	8.00	150.00	CABANAS
20	JUTIAPA-LLANO LARGO	RURAL	6.00	112.50	CABANAS
21	D.KM 16 (ILOBASCO-EL GUAYABO)-CAS EL MESTIZO-CTN. S. FCO. DEL MONTE	RURAL	7.00	131.30	CABANAS
22	R/(TEJUTEPEQUE-CINQUERA)-CTN. SAN ANTONIO BUENAVISTA	RURAL	5.00	93.80	CABANAS
23	SAN PEDRO NONUALCO-LA CARBONERA-EL VOLCANCITO	RURAL	5.00	93.80	LA PAZ
24	CA:1-SANTA CLARA-SAN ILDEFONSO	TERTIARY	25.00	515.63	SAN VICENTE

Appendix D, Table D.1 continued

NO	NAME OF HIGHWAY	CATEGORY	LENGTH	INVEST.	DEPARTMENT
25	CA:2-CANTON TIERRA BLANCA-CUCHE DE MONTE	TERTIARY	14.00	280.00	USULUTAN
26	R/(BERLIN-SAN AGUSTIN)-QUESERA-LINARES	TERTIARY	13.00	260.10	USULUTAN
27	GUALACHE-LOS HORCONES-SAN FRANCISCO JAVIER	RURAL	12.00	225.00	USULUTAN
28	VILLA EL TRIUNFO-EL PAPALON	RURAL	9.00	168.80	USULUTAN
29	SANTA ELENA-LA MARAVILLA-EL VOLCAN	RURAL	4.00	75.00	USULUTAN
39	JUCUAPA-EL JOCOTON	RURAL	1.40	26.30	USULUTAN
31	JUCUAPA-LOMA LA CRUZ-CANTON EL CHILAMATE	RURAL	2.70	50.60	USULUTAN
32	POLOROS-MONTECA-CERRO LAS PENAS	RURAL	14.50	271.90	LA UNION
33	LISLIQUE-CORINTO (LA UNION SEGMENT)	RURAL	7.00	131.30	LA UNION
34	POLOROS-GUAJINIQUIL RIVER-CONCEPCION DE ORIENTE	RURAL	14.00	262.50	LA UNION
35	EL AMATILLO-CANTON EL TALPETATE-EL SAUCE	RURAL	10.00	187.50	LA UNION
36	R/(POLOROS-MONTECA)-CANTON LAS MARIAS	RURAL	4.00	75.00	LA UNION
37	R/(POLOROS-MONTECA)-CANTON LAS LAJITAS	RURAL	4.10	76.90	LA UNION
TOTALS			373.20	7,264.73	$1,946/KM

Appendix D continued

TABLE D.2

EXTRACTED FROM THE RECONSTRUCTION PLAN FOR
HIGHWAY REHABILITATION TO BE IMPLEMENTED PER YEAR
PREPARED BY MOP/CAMINOS
YEAR 2

TO SHOW SUB-PROJECTS ELIGIBLE FOR FUNDING UNDER PROJECT NO. 394

NO	NAME OF HIGHWAY	CATEGORY	LENGTH	INVEST.	DEPARTMENT
1	R/(METAPAN-BELEN)-SAN MIGUEL INGENIO	RURAL	14.00	262.50	SANTA ANA
2	SAN JACINTO-AGUA CALIENTE-GUARNECIA-LEMPA RIVER	RURAL	16.00	300.00	SANTA ANA
3	R/(SANTA ANA-SAN PABLO TACACHICO)-EL COBANO-LOS APOYOS	RURAL	9.00	168.75	SANTA ANA
4	CHALATENANGO-SAN JOSE LAS FLORES-NUEVA TRINIDAD-ARCATAO	RURAL	28.50	534.38	CHALATENANGO
5	CA:4-KM. 14-CANTON SAN NICOLAS-COLONIA LA PONDEROSA-LAS CANAS RIVER	RURAL	12.00	225.00	SAN SALVADOR
6	APOPA-GUAZAPA-(OLD ROAD)	RURAL	9.00	168.75	SAN SALVADOR
7	GUAZAPA-CANTON LOMAS DE RAMOS	RURAL	5.00	93.75	SAN SALVADOR
8	R/(ISTAGUA-ORAT. DE CONCEPCION-MONTEPEQUE)-CTN. EL TRIUNFO-SAN JOSE	RURAL	11.00	206.25	CUSCATLAN
9	R/(SAN MARTIN-SUCHITOTO)-CANTON PALO GRANDE	RURAL	5.00	93.75	CUSCATLAN
10	CANTON PALO GRANDE-CANTON EL ROBLE	RURAL	4.00	75.00	CUSCATLAN
11	R/(SUCHITOTO-CINQUERA)-CANTONES TENANGO AND EL CAULOTE	RURAL	9.00	168.75	CUSCATLAN
12	R/(SUCHITOTO-AGUACOYO-CA:4)-CTN. PLATANARAL-EL COROZAL-LAS PEÑAS	RURAL	18.00	337.50	CUSCATLAN
13	TEJUTEPEQUE-CASERIO LAS LOMAS-ASESCO RIVER-LAS TRILLADERAS	RURAL	5.00	93.75	CABAÑAS
14	R/(TEJUTEPEQUE-CINQUERA)-CANTON SAN BONITO-CANTON HUILINUISTE	RURAL	4.00	75.00	CABAÑAS
15	CINQUERA-SAN ANTONIO	RURAL	3.00	56.30	CABAÑAS
16	JUTIAPA-CAS. LOS REMEDIOS-LLANO LARGO	RURAL	7.00	131.30	CABAÑAS
17	SAN SEBASTIAN-CATARINA-AMATITAN ARRIBA-AMATITAN ABAJO	RURAL	14.00	262.50	SAN VICENTE
18	R/(CA:2-EL PALOMAR-TECOLUCA)-CANTON SOLEDAD-EL MARQUEZADO	RURAL	8.00	150.00	SAN VICENTE
19	SAN FRANCISCO JAVIER-SAN LORENZO-BERLIN	RURAL	12.00	225.00	USULUTAN
20	R/(SAN FRANCISCO JAVIER-BERLIN)-LOS ARENALES-GUALACHE	RURAL	6.00	112.50	USULUTAN
21	JUCUAPA-LOMA LA CRUZ-EL COCO	RURAL	10.00	187.50	USULUTAN
22	R/(SAN AGUSTIN-EL JICARO)-EL JOCOTE	RURAL	10.00	187.50	USULUTAN
23	R/(CALIFORNIA-SANTA ELENA)-EL NISPERAL	RURAL	2.00	37.50	USULUTAN
24	CA:2-LAS 3 CALLES	RURAL	3.00	56.30	USULUTAN

Appendix D, Table D.2 continued

NO	NAME OF HIGHWAY	CATEGORY	LENGTH	INVEST.	DEPARTMENT
25	SANTIAGO DE MARIA-EL TIGRE-JUCUAPA	RURAL	12.00	225.00	USULUTAN
26	SANTIAGO DE MARIA-EL MARQUESADO	RURAL	5.00	94.00	USULUTAN
27	SAN FRANCISCO JAVIER-SAN AGUSTIN	RURAL	6.00	112.50	USULUTAN
28	CHINAMECA-JOCOTE DULCE-SAN JORGE	RURAL	14.50	271.87	SAN MIGUEL
29	R/(PLACITAS-SAN JORGE)-CHAMBALA	RURAL	7.00	131.25	SAN MIGUEL
39	CA:1-SAN JORGE-SAN LUIS-EL VOLCAN	RURAL	7.50	140.62	SAN MIGUEL
31	CIUDAD BARRIOS-DELICIAS DE CONCEPCION-L.D. MORAZAN	RURAL	6.00	112.50	SAN MIGUEL
32	CANTON MONTECA-CANTON UPIRE	RURAL	3.50	65.62	LA UNION
33	LISLIQUE-CASERIO DERRUMBADO-CERRO EL VENADO-BORDER WITH HONDURAS	RURAL	21.50	403.12	LA UNION
34	CONCEPCION DE ORIENTE-PUEBLO NUEVO-CANTON GUARIPE	RURAL	6.90	129.37	LA UNION
35	POLOROS-CASERIO EL OCOTE-GUAJINIQUIL RIVER-BORDER WITH HONDURAS	RURAL	11.00	206.25	LA UNION
	TOTALS		325.40	6,011.63	$1,075/KM

Appendix D continued

TABLE D.3

EXTRACTED FROM THE RECONSTRUCTION PLAN FOR
HIGHWAY REHABILITATION TO BE IMPLEMENTED PER YEAR
PREPARED BY MOP/CAMINOS
YEAR 3

TO SHOW SUB-PROJECTS ELIGIBLE FOR FUNDING UNDER PROJECT NO. 394

NO	NAME OF HIGHWAY	CATEGORY	LENGTH	INVEST.	DEPARTMENT
1	EL GRAMAL-POTONICO-CANCASQUE	RURAL	14.00	262.50	CHALATENANGO
2	POTONICO-MONTE REDONDO-CORRAL FALSO	RURAL	5.00	93.75	CHALATENANGO
3	R/(TEJUTLA-SAN FRANCISCO MORAZAN)-EL CARRIZAL	RURAL	2.00	37.50	CHALATENANGO
4	R/(CANTON PLATANARES-CASERIO LOS PALITOS)-CANTON EL TABLON	RURAL	5.00	93.75	CUSCATLAN
5	R/(SUCHITOTO-AGUACAYO-CA:4)-CASERIO LAS PENAS-CANTON SAN CRISTOBAL	RURAL	12.00	225.00	CUSCATLAN
6	R/(CASERIO LAS PENAS-SAN CRISTOBAL)-CASERIO LA LAJA-LOS ALMENDROS	RURAL	5.60	105.00	CUSCATLAN
7	SAN JOSE GUAYABAL-CANTON LA CRUZ	RURAL	4.00	75.00	CUSCATLAN
8	R/(SUCHITOTO-AGUACAYO-CA:4)-CANTON LA ASUNCION-EL TRAPICHE	RURAL	5.00	93.75	CUSCATLAN
9	R/(JUTIAPA-LLANO LARGO)-CASERIO EL JOCOTILLO-VALLE NUEVO	RURAL	4.00	75.00	CABANAS
10	JUTIAPA-CANTON EL PLATANAR	RURAL	1.00	18.75	CABANAS
11	JUTIAPA-CAS. LOS LLANITOS-EL COCO-LA CRIBA-R/(TEJUTEPEQUE-CINQUERA	RURAL	10.00	187.50	CABANAS
12	CASERIO LA TEJERA-PRESA 5 DE NOVIEMBRE	RURAL	5.00	93.75	CABANAS
13	R/(CA:2-EL PALOMAR-TECOLUCA)-LOS TINUILOTES-CA:2	RURAL	5.00	93.75	SAN VICENTE
14	SAN ILDEFONSO (VADO EL LAGARTO-CORLANTIQUE)	RURAL	12.60	236.25	SAN VICENTE
15	CA:1-CANTON EL REBELDE	RURAL	0.40	7.50	SAN VICENTE
16	R/(CA:2-SAN NICOLAS LEMPA-LA PITA)-LOS CONEJOS-LAS ANONAS	RURAL	0.80	15.00	SAN VICENTE
17	R/(BERLIN-SANTA CRUZ-COROZAL)-LINARES	RURAL	16.00	300.00	USULUTAN
18	NUEVA GRANADA-LA PALOMILLA-GUALCHO RIVER	RURAL	13.00	243.75	USULUTAN
19	R/(JUCUAPA-SANTA ELENA)-JOYA ANCHA-LA MARAVILLA	RURAL	6.00	112.50	USULUTAN
20	SANTA ELENA-EL NISPERO-EL VOLCAN	RURAL	3.50	65.63	USULUTAN
21	CALIFORNIA-EL POZON	RURAL	2.00	37.50	USULUTAN
22	R/(SAN AGUSTIN-BERLIN)-LINARES	RURAL	15.00	281.25	USULUTAN
23	R/(CHINAMECA-EL PACAYAL)-CERRO EL LIMBO	RURAL	2.00	37.50	SAN MIGUEL
TOTALS			148.90	2,791.88	$18,750/KM

Appendix D continued

TABLE D.4

EXTRACTED FROM THE RECONSTRUCTION PLAN FOR
HIGHWAY REHABILITATION TO BE IMPLEMENTED PER YEAR
PREPARED BY MOP/CAMINOS
YEAR 4

TO SHOW SUB-PROJECTS ELIGIBLE FOR FUNDING UNDER PROJECT NO. 394

NO	NAME OF HIGHWAY	CATEGORY	LENGTH	INVEST.	DEPARTMENT
1	R/(SUCHITOTO-AGUACAYO-CA:4)-CASERIO LOS GRANALES	RURAL	3.00	56.25	CUSCATLAN
2	R/(SANTA CRUZ MICHAPA-TENANCINGO)-CANTON CORRAL VIEJO	RURAL	6.00	112.50	CUSCATLAN
3	R/(SANTA CRUZ MICHAPA-TENANCINGO)-JIBUCO-CANTON ROSARIO-EL TABLON	RURAL	4.00	75.50	CUSCATLAN
4	R/(SANTA CRUZ MICHAPA-TENANCINGO)-CANTON COPALCHAN	RURAL	4.00	75.00	CUSCATLAN
5	TENANCINGO-(INTERSECTION-SUCHITOTO-CINQUERA)-CANTON GUADALUPE	RURAL	1.10	20.63	CUSCATLAN
6	SUCHITOTO-SUCHITLAN LAKE	RURAL	1.60	30.00	CUSCATLAN
7	R/(EL SILLERO RIVER-SAN JOSE GUAYABAL)-CANTON LOS RODRIGUEZ	RURAL	2.00	37.50	CUSCATLAN
8	R/(EL SILLERO RIVER-SAN JOSE GUAYABAL)-CANTON LOS MELENDEZ	RURAL	3.10	58.13	CUSCATLAN
9	JUCUAPA-EL PARAISAL	RURAL	6.00	112.50	USULUTAN
10	JUCUAPA-LOMA LA CRUZ-LLANO EL CHILAMATE-SAN BUENAVENTURA	RURAL	3.70	69.38	USULUTAN
11	R/(SANTA ELENA-CALIFORNIA-MISPERAL ARRIBA)-PLAN GRANDE	RURAL	5.00	93.75	USULUTAN
12	R/(BERLIN-LINARES)-CANTON HOMBRE DE DIOS-QUESERA	RURAL	6.00	112.50	USULUTAN
13	R/(SAN MARCOS LEMPA-LINARES)-BOLIVAR	RURAL	6.00	112.50	USULUTAN
	TOTALS		51.50	965.64	$18,750/KM

GRAN TOTAL, 4 YEARS	999 KM	$17,883,000 AVERAGE = $18,948/KM

Authors Note: This reconstruction program as prepared by MOP/CAMINOS apparently reflects Caminos judgement of the capacity of the organization to implement projects. Spot checks in some departments shows it does not reflect the total need in the rural areas. For instance, there are no projects at all in this list for the Department of Morazán, and a number of roads that should be rebuilt in ex-conflictive zones of Santa Ana, Usulután, San Salvador and Chalatenango are not included.

APPENDIX "E"

PROJECT 320
ROAD SUB-PROJECTS SCHEDULED UNDER PROJECT 320
IN THE EX-CONFLICTIVE ZONE THROUGH 1993

Department/ Municipality	Description	Length Km.	Remarks Schedule Start Road Class
Cabañas			
Villa Victoria	Villa Victoria, San Antonio-Santa Marta	14.00	1990-Tert.
Villa Victoria	Villa Victoria, Sensuntepeque	11.25	1991-Tert.
Ilobasco	Ilobasco-Tejutepeque	6.10	1991-Tert.
Villa Dolores	Puente Titihuapa, Villa Dolores, Sensuntepeque	21.80	1992-Tert.
Ilobasco	R/(Ilobasco-Presa 5 de Nov) Cerrón Grande	6.00	1992-Tert.
Ilobasco	Ilobasco-Presa 5 de Nov.	31.40	1992-Tert.
Ilobasco	R/(CA-1 Ilobasco) Sensuntepeque	31.35	1993-Sec.
Ilobasco	CA-1 Ilobasco	8.00	1993-Sec.
	Total, Cabañas	**129.90**	
La Unión			
Anamorós	Ruta Militar-Anamorós, Nueva Esparta	23.30	1990-Tert.
El Sauce	Ruta Militar-El Sauce-Concepción de Oriente	10.55	1991-Tert.
Anamorós	Anamorós-Lislique	8.25	1991-Rural "A"
Nueva Esparta	Nueva Esparta-Polorós	5.50	1991-Rural "A"
	Total, La Unión	**47.60**	
Santa Ana			
Santa Rosa Guachipilín	CA:1-Metapán-Tahuilpa-Santa Rosa-Guachipilín	24.00	1992-Tert.
	Total, Santa Ana	**24.00**	

Appendix E continued

Department/ Municipality	Description	Length Km.	Remarks Schedule Start Road Class
Cuscatlán			
Suchitoto	Suchitoto-Copapayo	21.00	1990-Rural "A"
Tenancingo	San Cruz Michapa-Tenancingo	14.50	1991-Tert.
San José Guayabal	R (CA:1-Tonacatepeque-San José Guayabal	11.00	1992-Tert.
El Rosario	R (San Rafael Cedros-Sensuntepeque)-El Rosario	5.40	1992-Tert.
Suchitoto	R (San Martín-Suchitoto)-Oratorio de Concepción	5.50	1992-Rural "A"
San José Guayabal	Oratorio de Concepción-San José Guayabal	5.20	1992-Rural "B"
San José Guayabal	Guayabal-Río El Sillero-La Paz	4.00	1992-Rural "A"
San José Guayabal	R/ (San Martín-Suchitoto) Montepegue-S. José Guayabal	13.00	1992-Rural "A"
	Total, Cuscatlán	**79.60**	
La Paz			
Jerusalén	San Pedro Nonualco-Jerusalén	12.20	1992-Tert.
Santa María Ostuma	San Pedro Nonualco-Santa María Ostuma	4.40	1992-Tert.
San Pedro Nonualco	Ca-2 Km. 45.5-San Pedro Nonualco	15.00	1993-Tert.
	Total, La Paz	**31.60**	
La Libertad			
San Matías	Opico-San Matías	5.00	1992-Rural "A"
Quezaltepeque	San Matías-Atapasco-Quezaltepeque	8.00	1992-Rural "B"
	Total, La Libertad	**13.00**	

Appendix E continued

Department/ Municipality	Description	Length Km.	Remarks Schedule Start Road Class
San Salvador			
Tonacatepeque	Ilopango-Tonacatepeque	11.00	1991-Tert.
Tonacatepeque	San Martín-Tonacatepeque	13.00	1992-Rural"A"
Aguilares	Aguilares-El Paisnal-San Pablo Tacachico	22.90	1992-Tert.
Guazapa-Nejapa	Guazapa-Cantón Bonete-Nejapa	13.50	1992-Rural "B" Bridge?
	Total, San Salvador	**60.40**	
San Vicente			
San Ildefonso	CA:1-San Ildefonso	11.90	1991-Tert.
Verapaz	San Ramón-Verapaz	7.00	1991-Tert.
Verapaz	San Vicente-Nuevo Tepetitán -Verapaz-Jerusalén	12.80	1992-Tert.
San Esteban Catarina	San Esteban Catarina-San Lorenzo	11.00	1992-Tert.
Verapaz	Verapaz-Guadalupe	5.00	1992-Rural "A"
Guadalupe	Guadalupe-Laguneta-La Paz	3.00	1992-Rural "B"
	Total, La Paz	**50.70**	
San Miguel			
Sensori	Chapeltique-Sensori	16.00	1991-Rural "A"
Ciudad Barrios	Ciudad Barrios-San Luis de La Reina	12.00	1992-Rural "A"
San Antonio	Ramal (Ciudad Barrios-San Luis de La Reina)-San Antonio	6.00	1992-Rural "A"
Chatelpique	Chatelpique-Ciudad Barrios	16.90	1992-Tert.
Chinameca	Chinameca-Jucuapa		1993-Sec.
Chinameca	CA:1-Nueva Guadalupe-Chinameca	4.72	1993-Sec.
	Total, San Miguel	**55.62**	

Appendix E continued

Department/ Municipality	Description	Length Km.	Remarks Schedule Start Road Class
Morazán			
Sociedad	Ruta Militar-Sociedad	9.50	1992-Tert.
San Francisco Gotera	Chapeltique-Guatajiagua-Yamabal-S. Francisco Gotera	26.30	1992-Tert.
Yamabal	Yamabal-Villerias	6.00	1992-Rural "B"
Sensembra	Yamabal-Sensembra	1.00	1992-Rural "B"
Sensembra	Chilanga-Qda. Honda-El Chaparral-Sensembra	8.00	1992-Rural "B"
Yamabal	Yamabal-Joya del Matazano-Caserío Los Cimientos	13.00	1992-Rural "B"
Cacaopera	Delicia de Concepción-Cacaopera	6.00	1992-Tert.
San Francisco Gotera	CA:7-San Francisco Gotera	15.00	1993-Sec.
Delicia de Concepción	San Francisco Gotera-Delicia de Concepción	12.00	1993-Sec.
	Total, Morazán	**96.80**	

Appendix E continued

Department/ Municipality	Description	Length Km.	Remarks Schedule Start Road Class
Usulután			
San Francisco Javier	CA:2-San Francisco Javier	8.00	1992-Tert.
San Agustín	CA:2-San Agustín	8.00	1992-Tert.
Berlín	Berlín-San Agustín	16.00	1992-Tert.
Berlín	Berlín-San Juan Loma Alta	10.00	1992-Tert.
Jucuarán	Jucuarán-El Almendro-Vado Marín-Morolapa	15.50	1992-Rural "A"
Berlín	Berlín-Alegría	6.60	1993-Sec.
Berlín	CA:1-Mercedes Umaña-Berlín	10.50	1993-Sec.
Jucuapa	CA:1-San Buena Ventura-Jucuapa	4.00	1993-Sec.
Estanzuela	CA:2-Jiquilisco-Puerta El Triunfo	9.50	1993-Sec.
Jiquilisco	CA:2-Jiquilisco-Puerto El Triunfo	9.60	1993-Sec.
Jucuapa	Jucuapa-Chinameca-San Miguel	2.00	1993-Sec.
	Total, Usulután	**99.70**	
Chalatenango			
Chalatenango	CA:4-Chalatenango	28.00	1993-Sec.
Citalá	Citalá-Metapán. S.A.	45.00	1991-Rural "B"
Agua Caliente	CA:3-El Orrajuelo-Agua Caliente	11.20	1992-Tert.
	Total, Chalatenango	**84.20**	

Total Secondary, Tertiary, Rural "A" and Rural "B" Roads Scheduled for Rehabilitation under USAID Project 320: 773.12 Km.

APPENDIX "F"

BRIDGE PROJECTS
IN THE NATIONAL RECONSTRUCTION PLAN
MARCH, 1992

Department/ Bridge Name	Route	Municipality	Length Meters	Cost 000 $
Cabañas				
Titihuapa	Villa Dolores-San Ildefonso	---	50.0	400.
Chalatenango	Chalatenango-San Francisco Lempa	---	11.0	59.
La Libertad				
Tepemicho	R/San Pablo Tacachico Hwy-L.D. Santa Ana	San Pablo Tacachico	12.5	53.
El Jocote	R/Quezaltepeque-Las Flores	Quezaltepeque	11.0	58.
Paso Hondo	R/San Pablo Tacachico-El Paisnal	San Pablo Tacachico	25.75	73.
Ira	CA:1-San Juan Opico	San Juan Opico	43.00	98.
Colón II	CA:1-Zapotitán	Colón	18.20	106.
La Paz				
Above Río Cuyultitán	Int. CA:-2 San Salvador-Comalapa	Cuyultitán	20.0	185.
Oaxacala	R/Comalapa-L.D. San Vicente CA:2	San Luis Talpa	20.0	185.
Morazán				
Above Quebrada Seca	CA:7	Divisadero	19.0	69.
Torola	CA:7-Oscicala-Meanguera	Oscicala Meanguera	54.0	520.
San Miguel				
Olas Polato	R/(CA:7-Agua Zarca) R. Villerías	San Miguel	6.0	56.
Piedra Pacha	CA:2	El Tránsito	21.0	213.

Appendix F continued

Department/ Bridge Name	Route	Municipality	Length Meters	Cost 000 $
San Salvador				
Agua Caliente	CA:1-Old Road to Soyapango	Soyapango	32.0	336.
Las Cayas	Between Soyapango and Tonacatepeque	Soyapango	52.0	481.
San Vicente				
La Zorra	San Vicente-Tepetitán Verapaz	Verapaz and Tepatitán	11.30	92.
El Carrizo	CA:1-Santa Clara	Santa Clara	10.60	105.
Above Quebrada Seca	CA:1	Santa Clara	12.0	300.
Usulután				
Dev. Los Mangos	CA:2	Jiquilisco	13.00	100.
Above Quebrada El Coyolito	CA:2	Jiquilisco	12.50	124.
Palo Seco	CA:2	Jiquilisco	14.00	142.
Dev. Jiquilisco	CA:2	Jiquilisco	13.00	128.
Vado Marín	CA:2 Jucuarán	Jucuarán	35.00	328.
Moropala	CA:2 To El Espino	Jucuarán	60.70	572.

APPENDIX "G"

EXTRACTED FROM THE RECONSTRUCTION PLAN FOR
BRIDGE RECONSTRUCTION TO BE IMPLEMENTED PER YEAR
PREPARED BY MOP/CAMINOS

TO SHOW SUB-PROJECTS ELIGIBLE FOR FUNDING UNDER PROJECT NO. 394

NO	NAME OF BRIDGE	CATEGORY	LENGTH	INVEST.	DEPARTMENT
1	TEPEMICHO (CARRETERA SAN PABLO TACACHICO-L.D. STA. ANA EST. 57+200)	TERTIARY	12.50	53.00	LA LIBERTAD
2	EL JOCOTE (CARRET. QUEZALTEPEQUE-LAS FLORES EST. 11+100)	RURAL	11.00	58.00	LA LIBERTAD
3	PASO HONDO (CARRET. SAN PABLO TACACHICO-EL PAISNAL EST. 53+000)	TERTIARY	25.75	73.00	LA LIBERTAD
4	IRA (CARRET. CA:1-SAN JUAN OPICO)	SECONDARY	43.00	98.00	LA LIBERTAD
5	COLON II (CA:1-ZAPOTITAN EST 7+300)	RURAL	18.20	106.00	LA LIBERTAD
6	MUCA (CHALATENANGO-SAN FRANCISCO LEMPA EST.0+300)	RURAL	11.00	59.00	CHALATENANGO
7	LA ZORRA (SAN VICENTE-TEPETITAN-VERAPAZ EST. 5+000)	TERTIARY	11.30	92.00	SAN VICENTE
8	OLAS POLATO (CA:7-AGUA ZARCA R. VILLERIAS EST.3+100)	RURAL	6.00	56.00	SAN MIGUEL
9	TITINUAPA (VILLA DOLORES-SAN ILDEFONSO)	TERTIARY	50.00	400.00	CABAÑAS
10	VADO MARIN (CA:2-JUCUARAN)	TERTIARY	35.00	328.00	USULUTAN
11	MOROPOLA (CA:2-TOWARD EL ESPINO KM. 131)	TERTIARY	60.70	573.00	USULUTAN
TOTALS			303.45	1,964.00	$6,472/M*

* Caminos estimate.

Field investigation by the author shows the need for bridges on rural roads to make roads passable 12 months a year is far greater than stated here. Some of the additional needs identified to date are shown in another Appendix.

APPENDIX "H"

BRIDGES AND STREAM CROSSINGS
REPRESENTATIVE OF REQUIREMENTS

[These sites were identified on a relatively few field trips to a relatively few municipalities in most departments. It is not, therefore, an exhaustive list, but representative of what would be found on an inventory and evaluation of stream crossing, especially on tertiary and lower roads, but in a few cases on higher class roads. The tabulation gives a qualitative indication of how badly the problem has been underestimated.]

Department/ Municipality	Location or Bridge/Stream Name	Probable Type	Estimated Length Meters	Budget Cost $000 (Preliminary)
Usulután				
San Agustin	CA:2 to San Agustin	B	12	65
San Agustin	5 (additional) bridgesof unspecified length		---	---
Santa Elena	5 bridges of unspecified length		---	---
Concepción Batres	2 bridges of unspecified length		---	---
Bregnayquin	2 bridges of unspecified length		---	---
Jucuapa	3 bridges of unspecified length		---	---
Jiquilisco	7 bridges of unspecified length		---	---
San Francisco Javier	9 bridges of unspecified length		---	---
Santa Ana				
Santa Rosa Guachipilin	CA:3 across Rio Lempa	B	50 ?	375
Texistepeque	Texistepeque to San Antonio Pajonal across Rio Guajoyo	B	40	300
Santa Rosa Guachipilin	Locations not specified by mayor - 10 bridges		300 ?	---
Texistepeque	Texistepeque to Ctn. San Miguel 3 crossings			
Masahuat	Masahuat to Las Piedras across Rio Lempa	B-S	140	275
Santa Ana-Chalatenango				
Texistepeque-Nueva Concepción	Guarnecia to Potrero Suia across Rio Lempa		50	400

Appendix H continued

Department/ Municipality	Location or Bridge/Stream Name	Probable Type	Estimated Length Meters	Budget Cost $000 (Preliminary)
Chalatenango				
Nueva Concepción	Potrero Sula to Río Lempa across tributary of Río El Amatal		30	175
La Reina	La Reina to El Tigre across Río Talquezalapa		30	200
Santa Rita	CA:3 to Santa Rita across tributary not named on map		40	240
Chalatenango	Chalatenango to San Francisco Lempa- Unnamed tributary		50	300
Chalatenango	Chalatenango to Guarjila and San Antonio Los Ranchos		40	400
San Antonio Los Ranchos	3 bridges of unspecified length		---	---
Chalatenango	Up to 10 (more) crossings of undetermined length		---	---
Cuscatlán				
Tenancingo	3 locations not specified by mayor		---	---
Suchitoto	5 locations not specified by mayor		---	---
San Miguel				
Sesori	7 bridges of various lengths		---	---
San Gerardo	Over Quebrada El Pito		---	---
Chapeltique	2 bridges of unspecified length		---	---
Morazán				
San Francisco Gotera	1 bridge of unspecified length		---	---
Sociedad	7 bridges of unspecified length		---	---
Arambala	1 bridge of unspecified length		---	---
Cacaopera	1 bridge of unspecified length		---	---
Corinto	0 bridges of unspecified length		---	---
Sensembra	3 bridges of unspecified length		---	---

Appendix H continued

Department/ Municipality	Location or Bridge/Stream Name	Probable Type	Estimated Length Meters	Budget Cost $000 (Preliminary)
San Salvador				
Tonacatepeque	1 bridge of undetermined length		---	---
Aguilares	9 bridges of undetermined length		---	---
El Paisnal	4 bridges of undetermined length		---	---
Nejapa	4 bridges of undetermined length		---	---
Apopa	2 bridges of undetermined length		---	---
La Libertad				
San Matias	1 bridge of undetermined length		---	---
San Juan Opico	1 bridge of undetermined length		---	---

Crossings in a limited number of departments and municipalities, identified by mayors, partial

Total to date: 128 bridges and stream crossings in 27 municipalities out of 115.

As of this date, some departments and municipalities have not supplied data.

Note 1: Several mayors in the non-conflict areas have also expressed a strong need for up to 11 bridges in the municipalities.

Note 2: If average length of these 128 crossings were 20 meters and all are bridges, probable cost is about $20,000,000.

APPENDIX "I"

WATER SYSTEM OWNED AND OPERATED BY ANDA
IN THE EX-CONFLICTIVE ZONE

Department/ Municipality	Total No. of Inhabitants in Municipality (SRN Estimate)	Total Served By ANDA System
Santa Ana		
Masahuat	5,061	611
Santa Rosa Chipilín	6,679	823
Texistepeque	22,866	3,433
Chalatenango		
Agua Caliente	10,501	1,675
Arcatao	9,478	1,925
Chalatenango	30,190	14,012
La Laguna	5,106	1,325
La Palma	11,355	2,691
Nueva Concepción	31,730	9,019
Ojos de Agua	5,232	1,295
San Antonio Los Ranchos	2,782	1,389
San Fernando	2,989	*
San José Cancasque	4,913	1,274
La Libertad		
San Juan Opico	47,110	7,959
San Matías	6,658	1,502
Quezaltepeque	42,554	25,603

* Not currently included in ANDA Reconstruction Plan.

Source: (1) ANDA Bulletin of Statistics (Boletín Estadístico) No. 13, 1991.
(2) ANDA Reconstruction Plan.
(3) SRN Population Estimates (not confirmed or reconciled).

Appendix I continued

Department/ Municipality	Total No. of Inhabitants in Municipality (SRN Estimate)	Total Served By ANDA System
San Salvador		
Aguilares	17,398	14,411
Apopa	30,504	*
Guazapa	15,130	7,191
Nejapa	21,218	4,377
Tonacatepeque	18,310	14,417
Cuscatlán		
Suchitoto	44,670	6,050
San José Guayabal	13,298	2,556
Tenancingo	12,939	1,791
La Paz		
Jerusalem	2,493	793
Mercedes La Ceiba	877	467
Paraiso de Osorio	2,639	2,257
San Pedro Nonualco	11,818	3,993
Santa María Ostuma	7,198	1,860
Santiago Nonualco	36,658	6,138
Cabañas		
Ilobasco	59,516	10,239
Jutiapa	13,977	1,144
San Isidro	12,359	2,040
Sensuntepeque	54,828	12,967
Tejutepeque	8,521	2,040
Villa Victoria	21,272	2,328

Appendix I continued

Department/ Municipality	Total No. of Inhabitants in Municipality (SRN Estimate)	Total Served By ANDA System
San Vicente		
Apastepeque	22,386	4,097
Guadalupe	6,430	2,295
San Esteban Catarina	11,247	*
San Sebastián	21,415	6,218
Santa Clara	10,757	1,427
Tecoluca	35,310	3,005
Verapaz	7,381	2,147
Usulután		
Alegría	12,266	1,803
Berlín	33,359	7,532
California	3,067	1,891
Concepción Batres	17,150	2,408
El Triunfo	6,419	2,867
Estanzuelas	13,639	3,550
Jiquilisco	61,048	8,263
Jucuapa	18,956	7.798
Jucuarán	27,640	2,280
Nueva Granada	7,859	1,929
Santa Elena	21,113	5,491
Santiago de María	20,255	10,899
Tecapán	10,194	2,144

Appendix I continued

Department/ Municipality	Total No. of Inhabitants in Municipality (SRN Estimate)	Total Served By ANDA System
Morazán		
Jocoaitique	8,330	1,033
Perquín	3,665	519
San Francisco Gotera	14,208	7,576
Sensembra	4,438	672
La Unión		
Anamorós	21,912	1,518
Nueva Esparta	16,352	1,892
San Miguel		
Carolina	11,690	2,223
Chinameca	30,741	7,387
San Gerardo	14,342	2,066
San Jorge	13,598	4,972
San Rafael Oriente	16,929	6,655
Sesori	22,414	1,788
68 Systems		

Source: Developed by the author from data furnished by ANDA and SRN.

65 - Scheduled for rehabilitation
3 - No work proposed now under Reconstruction Plan funded by IDB.

APPENDIX "J"

WATER SYSTEMS IN NEED OF REPAIR OWNED AND OPERATED BY PLANSABAR IN THE EX-CONFLICTIVE ZONE

TABLE J.1
WORKS TO BE EXECUTED IN PROJECTS TO BE REBUILT IN THE COUNTRY

Department/ Municipality	Name of Project	Population Benefited	PLANSABAR Estimate C
Chalatenango			
Nombre de Jesús	Cas. Nda. Vieja, Ctn. Plazuelas	600	97,500.00
Nombre de Jesús	Ctn. Los Henriquez	632	260,000.00
La Palma	Ctn. Los Planes	700	396,500.00
La Palma	Cas. El Túnel, Ctn. San José Sacared	422	194,650.37
Citalá	Ctn. San Ramón	400	325,000.00
Citalá	Ctn. Los Planes	680	357,500.00
Citalá	Ctn. Llano de La Virgen	210	162,500.00
Chalatenango	Asent. El Dorado I, II and III	5,520	500,617.00
Chalatenango	Cas. Cancuyo, Ctn. Chiapas	725	523,900.00
Chalatenango	Cas. Guarjilita, Ctn. Guarjila	860	260,000.00
Chalatenango	Ctn. El Pinar de San Ignacio	375	422,500.00
Nva. Concepción	Cas. Chilín and Sit. de Las Flores, Ctn. Potrero Sula	2,893	390,000.00
La Laguna	Cas. Pacayas and Candelarias	1,650	780,000.00
El Carrizal	Ctns. Vainilla and Potrerillos	632	260,000.00
San Isidro Labrador	Ctn. Los Amates	542	130,000.00
Nva. Trinidad	Ctn. Los Sitios	1,100	585,000.00
Ojos de Agua	Ctn. El Portillo	650	455,000.00
Ojos de Agua	Ctn. La Montañita	512	98,106.28
Las Vueltas	Ctn. Los Naranjos	490	325,000.00
San Ignacio	Cas. Las Pilas	1,526	106,600.00
San Francisco Morazán	Cas. San Luis El Terrero	325	357,500,00

Appendix J, Table J.1 continued

Department/ Municipality	Name of Project	Population Benefited	PLANSABAR Estimate C
San Salvador			
Tonacatepeque	Cas. Santa Teresa, Ctn. Las Flores	370	130,000.00
Guazapa	Ctn. San Gerónimo	3,824	349,291.68
Guazapa	Cas. Santo Domingo, Ctn. San Jerón	380	65,000.00
Cuscatlán			
Suchitoto	Ctn. Aquacayo	700	84,500.00
Suchitoto	P.H. Ichanqueso	1,500	756,987.79
Suchitoto	Ctn. Montepeque	1,300	780,000.00
San José Guayabal	Ctn. El Salitre	830	79,134.00
Tenancingo	Ctn. Copalchán	900	614,312.95
Cabañas			
Ilobasco	Ctn. Sayulapa	714	295,100.00
Ilobasco	Cas. El Carmen, Ctn. Potrero	280	100,100.00
San Isidro	Cas. San Francisco El Dorado	1,630	650,000.00
Sensuntepeque	Ctn. El Chunte	1,800	819,000.00
Cinquera	Ctn. Escopeta	380	490,100.00
La Paz			
Stgo. Nonualco	Ctn. Santa Rita Almendros	900	222,946.10
Stgo. Nonualco	Ctn. San Antonio Abajo	500	260,000.00
Stgo. Nonualco	Ctn. San Antonio Arriba	400	288,353.00
Stgo. Nonualco	Ctn. Santa Teresa	400	325,000.00
Stgo. Nonualco	Ctn. San José La Loma	3,200	650,000.00
Stgo. Nonualco	Ctn. Santa Cruz Loma	2,500	260,000.00
San Pedro Nonualco	Ctn. Hacienda Vieja	900	143,533.00
Sta. M. Ostuma	Ctn. El Chaperno	1,950	257,131.30
Sta. M. Ostuma	Ctn. San José Carrizal	600	335,227.17
Sta. M. Ostuma	Ctn. Concepción	700	134,368.00

Appendix J, Table J.1 continued

Department/ Municipality	Name of Project	Population Benefited	PLANSABAR Estimate C
San Vicente			
Tecoluca	Ctns. El Arco and San Diego	450	195,000.00
San Sebastián	Ctn. El Paraiso	600	132,896.40
Verapaz	Ctns. San Jerónimo and El Limón	600	435,500.00
Usulután			
Stgo. de María	Ctn. Marquezado	125	357,500.00
Berlín	Cas. El Rec., Ctn. San Juan Loma Alta	514	292,500.00
Berlín	P.M. de Berlín (10)	7,200	1,317,020.26
Santa Elena	P.M. de Santa Elena (3)	3,600	1,400,638.35
Santa Elena	P.M. Santa Elena (2)	4,400	2,030,704.72
Estanzuelas	Ctn. El Escarbadero (2)	1,300	299,130.00
Jucuarán	Ctn. Samuria	700	412,324.90
San Miguel			
Chapeltique	Ctn. San Pedro El Jiote	2,760	351,780.00
Chapeltique	Cas. Potosí, Ctn. San Pedro	516	455,000.00
Ciudad Barrios	Ctn. San Luisito	644	340,882.43
Carolina	P.M. Rosas de Nacaspilo (5)	1,600	483,442.70
San Luis de La Reina	Cas. Los Velázquez, Ctn. San Juan	800	552,500.00
Morazán			
Sensembra	Ctn. El Rodeo	356	65,000.00
Jocoatique	Ctn. El Rodeo (2)	520	325,000.00
Meanquera	Cas. San Luis, Ctn. La Joya	338	93,591.62
Oscicala	Ctn. Cerro del Coyol	500	325,000.00
Oscicala	Cas. Pueblo Viejo, Ctn. Agua Zarca	230	130,000.00
Yamabal	Ctn. Flamenco	800	484,900.00
San Isidro	Ctn. Piedra Parada	450	104,000.00

Appendix J, Table J.1 continued

Department/ Municipality	Name of Project	Population Benefited	PLANSABAR Estimate C
Morazán continued			
San Simón	Ctns. El Cerro, Las Quebradas and Valle Grande	600	234,000.00
La Unión			
Nva. Esparta	Cas. Los Vásquez, Cta. El Portillo	436	45,500.00
Nva. Esparta	Cas. El Portillo, Cta. El Portillo	417	52,000.00
Anamorós	Cta. Huertas Viejas	157	230,000.00
Lislique	Cta. El Derrumbado	148	236,600.00
Santa Ana			
Santa Rosa Guachipilín	Cta. Llanos de la Majada	900	142,673.70
Texistepeque	Texis Junction	918	143,000.00
Totals		00,618	C26,764,036.00 $ 3,140,710.00

TABLE J.2

REHABILITATION PROJECTS (AT PROFILE LEVEL)

Name of Project	Department	Population Benefited/ Inhabitants	Type of Project	Total Cost C
Cas. Canyuco, Ctn. Chiapas, J/Chalatenango	Chalatenango	225	Gravity	50,650.00
Cas. Pié de La Cuesta and Las Cañitas, Ctn. Llano de La Virgen, J/Citalá	Chalatenango	300	Gravity	166,769.00
Ctn. Los Henriquez, J/Nombre de Jesús	Chalatenango	300	Gravity	171,793.50
Ctn. El Pinar, J/San Ignacio	Chalatenango	400	Gravity	238,286.00
Ctn. Llano Grande, J/Concepción Quezalt.	Chalatenango	1,500	Gravity	464,986.00
Ctns. Guarjila and Guarjilita, J/Chalatenango	Chalatenango	1,800	Gravity	538,474.00
Ctn. Los Escalantes, J/Nombre de Jesús	Chalatenango	360	Gravity	351.773.00
Cas. Hacienda Vieja, Ctn. Plazuelas, J/Nombre de Jesús	Chalatenango	300	Gravity	320,322.00
Los Planes, J/Citalá	Chalatenango	600	Gravity	225,006.00
Ctn. El Portillo, J/Ojos de Agua	Chalatenango	450	Gravity	204,428.00
Ctn. Las Pilas, J/San Ignacio	Chalatenango	400	Gravity	324,672.00
Ctns. Vainillas and Potrerillos, J/El Carrizal	Chalatenango	1,062	Gravity	387,914.00
Ctn. Los Planes, J/La Palma	Chalatenango	840	Gravity	299,495.00
Ctn. San Jerónimo, J/Guazapa	San Salvador	1,320	Electric Pump	278,335.00
Ctn. San Ramón, J/Citalá	Chalatenango	150	Gravity	120,024.00
Asentamiento El Dorado, J/Chalatenango	Chalatenango	5,400	Electric Pump	2,977,990.00
Ctn. El Caracol, J/Villa Victoria	Cabañas	1,035	Gravity	165,600.00
Ctn. San José La Loma, J/Stgo. Nonualco	La Paz	528	Gravity	793,000.00
Ctn. Montepeque, J/Suchitoto	Cuscatlán	1,800	Gravity	951,600.00
Ctn. San Nicolás, J/Cinquera	Cabañas	100	Gravity	683,600.00
Ctns. El Arco and San Diego, J/Tecoluca	San Vicente	700	Gravity	237,900.00
Ctn. Las Dantas, J/Villa Victoria	Cabañas	540	Gravity	150,150.00
Ctn. La Bermuda, J/Villa Victoria	Cabañas	390	Gravity	151,400.00

Appendix J, Table J.2 continued

Name of Project	Department	Population Benefited/ Inhabitants	Type of Project	Total Cost C
Ctn. Aguacayo, J/Suchitoto	Cuscatlán	900	Electric Pump	103,200.00
Ctn. El Cacao, J/Cinquera	Cabañas	216	Gravity	254,975.00
Ctn. San Antonio Arriba, J/Stgo. Nonualco	La Paz	1,200	Electric Pump	351,780.00
Ctn. El Chante, J/Sensuntepeque	Cabañas	3,672	Gravity	999,180.00
Ctn. Sayulapa, J/Ilobasco	Cabañas	2,000	Gravity	360,200.00
Ctn. El Paraíso, J/San Sebastián	San Vicente	3,052	Electric Pump	162,153.00
Cas. El Palomar, Ctn. Paratao, J/Villa Victoria	Cabañas	420	Gravity	134,550.00
Ctn. San Antonio Villa Victoria	Cabañas	342	Gravity	216,100.00
Ctn. San Antonio Abajo, J/Stgo. Nonualco	La Paz	1,000	Electric Pump	317,200.00
Ctn. Chorrera del Guayabo, J/Ilobasco	Cabañas	696	Gravity	1,002,795.00
Ctn. San Gregorio, J/Sensuntepeque	Cabañas	3,060	Gravity	2,604,000.00
Ctn. Cerro Colorado, J/Ilobasco	Cabañas	8,804	Electric Pump	2,379,000.00
Totals		C47,710		20,028.124.00
2,356,250				$

APPENDIX "K"

SYSTEMS PROPOSED BY PLANSABAR
FOR FUNDING BY IDB
IN THE EX-CONFLICTIVE ZONE

TABLE K.1

IV STAGE IDB PROJECTS

No.	Site	Municipal Town	Department	Population Benefited	Total Cost C	System
1.	Ctn. Santa Teresa	San Matias	La Libertad	582.00	444,000.00	B-P
2.	San Francisquito	Yamabal	Morazán	930.00	700,000.00	G
3.	San Francisquito	San Fracisco Gotera	Morazán	1,140.00	630,000.00	G
4.	Ctn. Tierra Blanca	Jiquilisco	Usulután	3,501.00	890,001.25	B-P
5.	Cas. El Carrizal, Ctn. San Antonio Arriba	Santiago Nonualco	La Paz	630.00	283,546.00	G
6.	P.M. Ciudad Barrios II, La Esperanza, La Portaleza, Torrecillas	Ciudad Barrios	San Miguel	2,431.00	1,005,691.80	G
7.	Pm. San Emigdio, Molineros, San Emigdio, San Francisco Agua Agria, San Pedro Agua Caliente, San Antonio Los Ranchos	Guadalupe	San Vicente	2,730.00	1,481,200.00	B-P
8.	Cas. San Juan, Los Torres	Villa Victoria	Cabañas	474.00	293,900.00	G
9.	Ctn. Los Llanitos	Ilobasco	Cabañas	1,008.00	590,297.65	B
10.	Potosi	Chapeltique	San Miguel	516.00	220,000.00	G
11.	Ctns. Llano Alegre and Cerro El Coyol	Oscicala	Morazán	1,284.00	515,538.25	G
12.	Ctns. Lajas and Canoas	San Ildelfonso	San Vicente	822.00	773.532.10	B
13.	Ctn. El Zunza	Texistepeque	Santa Ana	650.00	500,000.00	G
14.	Cas. Alvarado, Santa Inés and Las Brisas	Santiago Nonualco	La Paz	2,298.00	1,041,894.90	G
15.	El Rosario	Cuscatlán	Cuscatlán	900.00	500,000.00	B-P
	Totals			19,896.00	C9,868,801.00 $1,161,035.00	

TABLE K.2

PROJECTS IN DESIGN PROCESS

No.	Site	Municipal Town	Department	Population Benefited	Total Cost C	System
1.	P.M. Nejapa	Nejapa	San Salvador	4,032.00	1,000,000.00	B
2.	P.M. El Aguacate	Sensuntepeque	Cabañas	2,100.00	700,000.00	G
3.	P.M. La Carbonera	San Pedro Nonualco	La Paz	3,000.00	1,000,000.00	B
	Totals			9,132.00	C2,700,000.00 $ 317,647.00	

B = Pump, G = Gravity, P = Pressure, and M = Manual.

APPENDIX "L"

RURAL ROAD PROJECTS TO BE FINANCED BY
INTERAMERICAN DEVELOPMENT BANK (IDB)
IN EX-CONFLICTIVE ZONES

Department/ Municipality/ Name of Project	Length Km.	**Class**	Year of Execution
1. **Usulután-San Miguel** El Tránsito-Jucurán El Litoral-Hacienda La Cabaña	10.10	Rural "A"	1993-95
2. **Usulután** Usulután-San Dionisio El Litoral-San Dionisio	9.00	Rural "A"	1993-94
3. **Usulután** Jiquilisco El Litoral-Cantón La Canoa	16.40	Rural "A"	1993-95
4. **La Paz** Santiago Nonualco El Litoral-Cooperativa Hoja de Sal	10.40	Rural "A"	1993-94
Total	45.90		

Total cost estimates for individual road segments have not been developed, but total cost for the four projects probably will be approximately $92,000, excluding project administration.

APPENDIX "M"
TABLE M.1

INVESTMENT REQUIRED IN RURAL SYSTEMS
TO REACH 62.5% COVERAGE WITH WATER SERVICE
TO RURAL POPULATIONS

ASSUME BASE STARTING POINT 12.4% COVERAGE AS REPORTED BY ANDA

Year	Population	Population Growth @2.932%	% Coverage	Total Coverage	Difference from Previous Year	Investment $000	
						Per Year	Total
1992	2,854,902	83,705	12.4	354,008	---	---	---
1993	2,938,607	86,160	17.4	511,318	157,310	19,664	19,664
1994	3,024,767	88,686	22.4	677,548	166,230	20,729	40,443
1995	3,113,453	91,287	27.4	853,086	175,538	21,942	62,385
1996	3,204,740	93,963	32.4	1,038,336	185,250	23,156	85,541
1997	3,298,703	96,718	37.4	1,233,715	195,379	24,422	109,963
1998	3,395,421	99,553	42.4	1,439,659	205,944	25,743	135,706
1999	3,494,974	102,473	47.4	1,656,618	216,959	27,120	162,826
2000	3,597,447	105,477	52.4	1,885,062	228,444	28,556	191,382
2001	3,702,924	108,578	57.4	2,125,478	240,416	30,052	221,434
2002	3,811,494	111,829	62.4	2,382,184	256,706	32,088	253,522

Current Population of El Salvador as estimated by USAID HPN: 5.6 million. Growth rate taken as current 29.32 per 1,000. Percentage of Rural Population Served 1992 Estimated by ANDA. Bulletin No. 13, 1991.

Appendix M continued

TABLE M.2

PERCENTAGE OF RURAL POPULATION THAT CAN BE SERVED WITH AN ANNUAL INVESTMENT OF $8,000,000 IN 5 YEARS IN RURAL WATER SYSTEMS

Year	Population	% Coverage	Total Coverage	Difference from Previous Year	Investment $000 Per Year	Investment $000 Total
1992	2,854,902	12.4	354,000	---	---	---
1993	2,938,607	14.2	418,000	64,400	8,000	8,000
1994	3,024,767	15.9	482,000	64,000	8,000	16,000
1995	3,113,453	17.5	546,000	64,000	8,000	24,000
1996	3,204,740	19.0	610,000	64,000	8,000	32,000
1997	3,298,703	20.4	674,000	64,000	8,000	40,000

TABLE M.3

INVESTMENT REQUIRED IN RURAL WATER SYSTEMS IF ANNUAL RATE OF COVERAGE INCREASE IS 1%

Year	Population	% Coverage	Total Coverage	Difference from Previous Year	Investment $000 Per Year	Investment $000 Total
1992	2,854,902	12.4	354,000	---	---	---
1993	2,938,607	13.4	393,773	39,765	4,971	4,971
1994	3,024,767	14.4	435,566	41,793	5,224	10,195
1995	3,113,453	15.4	479,472	43,906	5,488	15,683
1996	3,204,740	16.4	525,577	46,105	5,763	21,445
1997	3,298,703	17.4	573,974	48,397	6,050	27,496
1998	3,395,421	18.4	624,757	50,783	6,348	33,844
1999	3,494,974	19.4	678,025	53,268	6,659	40,503
2000	3,597,447	20.4	733,879	55,854	6,982	47,485
2001	3,702,924	21.4	792,426	58,547	7,318	54,803
2002	3,811,494	22.4	853,775	61,349	7,669	62,472

Appendix M continued

TABLE M.4

INVESTMENT REQUIRED IN RURAL WATER SYSTEMS
IF NUMBER OF PEOPLE SERVED EXACTLY
OFFSETS THE POPULATION INCREASE IN RURAL AREAS

Year	Population	% Coverage	Total Coverage	Difference from Previous Year	Investment $000	
					Per Year	Total
1992	2,854,902	12.4	354,008	83,705	10,463	10,463
1993	2,938,607	14.9	437,713	86,160	10,770	21,233
1994	3,024,767	17.3	523,873	88,686	11,086	32,319
1995	3,113,453	19.7	512,559	91,287	11,411	43,730
1996	3,204,740	22.0	703,846	93,693	11,712	55,442
1997	3,298,703	24.2	797,539	96,718	12,090	67,532
1998	3,395,421	26.3	894,257	99,553	12,444	79,976
1999	3,494,974	28.4	993,810	102,473	12,809	92,785
2000	3,597,447	30.5	1,096,283	105,477	13,185	105,970
2001	3,702,924	32.5	1,201,760	100,570	13,571	119,541
2002	3,811,494	34.4	1,310,330	111,829	13,979	133,520

Rural population figures derived from estimates provided by USAID/HPM. Initial 1992 coverage from ANDA Bulletin No. 13 for year 1991. Population growth of 29.32 per 1,000 provided by USAID/PHN. Assumed by the author to be uniform throughout the country.

TABLE M.5

INVESTMENT REQUIRED IN RURAL WATER SYSTEMS IF RATE OF INCREASE IN COVERAGE EQUALS POPULATION GROWTH OF 2.932%

ASSUME INITIAL 12.4% COVERAGE AS REPORTED BY ANDA

Year	Population	% Coverage	Total Coverage	Difference from Previous Year	Investment $000	
					Per Year	Total
1992	2,854,902	12.4	354,000	---	---	---
1993	2,930,607	15.332	450,547	96,539	12,067	12,067
1994	3,024,767	18.264	552,443	101,896	12,737	24,804
1995	3,113,453	21.196	659,920	107,485	13,436	38,240
1996	3,204,740	24.128	773,240	113,312	14,164	52,404
1997	3,298,703	27.06	892,629	119,389	14,924	67,328
1998	3,395,421	29.992	1,018,355	125,726	15,716	83,044
1999	3,494,974	32.924	1,150,685	132,330	16,541	99,585
2000	3,597,447	35,856	1,289,901	139,216	17,402	100,446
2001	3,702,924	38.788	1,436,290	146,389	18,299	118,745
2002	3,811,494	41.72	1,590,155	153,865	19,233	137,978

TABLE M.6

INVESTMENT REQUIRED IN RURAL WATER SYSTEMS
TO MAINTAIN COVERAGE AT 12.4%
(12.4% IS COVERAGE ANDA ESTIMATED IN 1991)

USAID/HPN POPULATION ESTIMATES EXTENDED

Year	Population	12.4% of Population	Difference in 12.4% Increment	Investment $000	
				Per Year	Cumulative
1992	2,854,902	354,008	---	---	---
1993	2,938,607	364,387	10,379	1,297	1,297
1994	3,024,767	375,071	10,684	1,336	2,633
1995	3,113,453	386,068	10,997	1,375	4,008
1996	3,204,740	397,388	11,320	1,415	5,423
1997	3,298,703	409,039	11,651	1,456	6,879
1998	3,395,421	421,032	11,993	1,543	8,378
1999	3,494,974	433,377	12,345	1,508	9,921
2000	3,597,447	446,083	12,706	1,635	11,509
2001	3,702,924	459,163	13,080	1,603	13,144
2002	3,811,494	472,625	153,865	19,233	14,827

GOES must invest an average of approximately $1,500,00 in new rural water systems each year and at the same time keep all existing systems repaired and in working order just to maintain the estimated percentage of coverage for the rural population.

The total investment would be $15,000,000 in water supply/sanitation facilities in small systems over a period of 10 years.

APPENDIX "N"
TABLE No. N.1

ANDA RECONSTRUCTION PLAN (BEING FINANCED BY IDB)
68 OF 148 SITES ARE IN EX-CONFLICTIVE MUNICIPALITIES
AVERAGE COST OF REPAIRS FOR WATER ONLY IN FIRST 38 SITES:
$25 PER CAPITA

No.	Location	Department	Population 1992	Water Investment	Sewer Investment	Total Investment
1	Apastepeque	San Vicente	2,807			
2	Santa Clara	San Vicente	1,722	1,801,766		1,801,766
3	Santa Elena	Usulutàn	7,650	679,400		679,400
4	San Rafael	San Miguel	7,200			-0-
5	San Jorge	San Miguel	5,825	3,761,345	165,179	3,926,524
6	Aguilares	San Salvador	18,384	2,028,131		2,028,131
7	San Matias	La Libertad	1,604	559,461		559,461
8	La Laguna	Chalatenango	3,000	293,988		293,988
9	Arcatao	Chalatenango	1,000	249,783		249,783
10	San José Cancasque	Chalatenango	800	383,563		383,563
11	Mercedes de La Ceiba	La Paz				-0-
12	Jerusalén	La Paz	972	705,070		705,707
13	Berlin	Usulutàn	8,880			-0-
14	Santiago de Maria	Usulutàn	15,126		11,286	11,286
15	Alegria	Usulutàn	1,648			-0-
16	Tecapàn	Usulutàn	2,069			
17	California	Usulutàn	1,164	5,387,898		5,387,898
18	Santa Rosa	Santa Ana	847	266,776		266,776
19	Tejutepeque	Cabañas	3,927	626,062		626,062
20	Carolina	San Miguel	1,431	340,215		340,215
21	Santiago Nonualco	La Paz	5,484	1,844,239	695,653	2,539,892
22	San Pedro Nonualco	La Paz	3,872	2,829,949	328,401	3,158,350
23	Sensuntepeque	Cabañas	16,039	3,789,432		3,789,432

Appendix N, Table No. N.1 continued

No.	Location	Department	Population 1992	Water Investment	Sewer Investment	Total Investment
24	Estanzuelas	Usulután	3,337	465,509		465,509
25	Ahuachapán	Ahuachapán	27,912	5,458,985	203,652	5,662,637
26	Quezaltepeque	La Libertad	17,250	2,808,471	358,900	3,167,380
27	Texistepeque	Santa Ana	3,300	1,304,467		1,304,467
28	San Pedro Perulapán	Cuscatlán	2,025	462,954		462,954
29	San Buena Ventura	Usulután	1,913	469,990		469,990
30	San Cristobal	Santa Ana	1,000	444,720		444,720
31	Puerto El Triunfo	Usulután	7,532	1,170,674	504,083	1,674,657
32	Sensembra	Morazán	735	522,874		522,874
33	Tecoluca	San Vicente	2,600	455,031		455,031
34	Suchitoto	Cuscatlán	7,250	983,367	4,648	988,015
35	San Francisco Gotera	Morazán	12,747	834,266	530,631	1,364,897
36	Guazapa	San Salvador	7,500	1,747,419		1,747,419
37	Apaneca	Ahuachapán	4,076	1,455,882		1,455,882
38	Huizúcar	La Libertad	3,168	1,015,642		1,015,642
	T O T A L		213,796	45,147,229	2,802,443	47,949,671

TABLE No. N.2

URBAN REHABILITATION PROGRAM FOR POTABLE WATER/SANITATION SYSTEMS IN THE NATIONAL RECONSTRUCTION PLAN

AHUACHAPAN DEPARTMENT

No.	Municipality	Urban Population
1.	Ahuachapán	26,539.00
2.	Atiquizaya	10,056.00
3.	Concepción de Ataco	6,487.00
4.	San Pedro Puxtla	1,934.00
5.	Apaneca	4,312.00
6.	San Francisco Menéndez	1,324.00
7.	Guaymango	1,577.00
8.	Jujutla	1,326.00
9.	Turín	3,464.00
10.	El Refugio	1,786.00
	Total	**58,805.00**

SANTA ANA DEPARTMENT

No.	Municipality	Urban Population
1.	Coatepeque	5,758.00
2.	Chalchuapa	27,509.00
3.	El Congo	6,763.00
4.	Texistepeque	3,433.00
5.	San Sebastian Salitrio	1,111.00
6.	Santiago de La Frontera	1,964.00
7.	Masahuat	611.00
8.	Santa Rosa Guachipilín	823.00
9.	San Cristobal (Border)	1,000.00
	Total	**18,972.00**

Appendix N, Table No. N.2 continued

SONSONATE DEPARTMENT

No.	Municipality	Urban Population
1.	Nahuizalco	9,794.00
2.	Acajutla	18,095.00
3.	Izalco	14,739.00
4.	Armenia	16,089.00
5.	San Julián	3,413.00
6.	Juayúa	7,605.00
7.	Sonzacate	7,638.00
8.	San Antonio del Monte	3,887.00
9.	San Isabel Ishuatán	1,075.00
10.	Caluco	1,086.00
11.	Salcoatitán	2,293.00
	Total	**85,714.00**

CHALATENANGO DEPARTMENT

No.	Municipality	Urban Population
1.	Chalatenango	14,042.00
2.	La Palma	2,691.00
3.	Nueva Concepción	9,019.00
4.	Arcatao	1,925.00
5.	San Antonio Los Ranchos	1,389.00
6.	San Luis del Carmen	821.00
7.	Cancasque	1,274.00
8.	O[illegible]s de Agua	1,295.00
9.	L[illegible] Laguna	1,325.00
10.	A[illegible]a Caliente	1,675.00
11.	C[illegible]alapa	1,033.00
	To[illegible]al	**36,489.00**

Appendix N, Table No. N.2 continued

SAN SALVADOR DEPARTMENT

No.	Municipality	Urban Population
1.	Tonacatepeque	14,417.00
2.	Guazapa	7,191.00
3.	Nejapa	4,377.00
4.	Aguilares	14,411.00
5.	Panchimalco	6,595.00
6.	Santo Tomás	8,180.00
7.	Santiago Texacuango	6,174.00
	Total	**61,345.00**

LA LIBERTAD DEPARTMENT

No.	Municipality	Urban Population
1.	La Libertad	16,818.00
2.	Quezaltepeque	25,603.00
3.	San Juan Opico	7,959.00
4.	Ciudad Arce	13,178.00
5.	Huizúcar	2,654.00
6.	Zaragoza	4,775.00
7.	San José Villanueva	2,679.00
8.	Colón	3,941.00
9.	San Matías	1,502.00
10.	Sacacoyo	2,533.00
11.	Teotepeque	3,178.00
12.	Jicalapa	1,183.00
	Total	**86,303.00**

Appendix N, Table No. N.2 continued

CUSCATLAN DEPARTMENT

No.	Municipality	Urban Population
1.	San Rafael Cedros	2,530.00
2.	Suchitoto	6,050.00
3.	San Bartolomé Perulapía	4,090.00
4.	San Pedro Perulapán	1,418.00
5.	Tenancingo	1,791.00
6.	Santa Cruz Michapa	1,198.00
7.	San Ramón	1,325.00
8.	Santa Cruz Analquito	1,799.00
9.	San José Guayabal	2,556.00
	Total	**22,757.00**

LA PAZ DEPARTMENT

No.	Municipality	Urban Population
1.	Zacatecoluca	25,808.00
2.	Santiago Nonualco	6,133.00
3.	San Juan Nonualco	4,857.00
4.	San Pedro Nonualco	3,993.00
5.	Olocuilta	5,302.00
6.	San Pedro Masahuat	3,030.00
7.	San Juan Talpa	3,727.00
8.	El Rosario	4,826.00
9.	Santa María Ostuma	1,860.00
10.	San Miguel Tepezontes	3,160.00
11.	San Rafael Obrajuelos	3,041.00
12.	San Luis Talpa	2.241.00
13.	San Antonio Masahuat	2,074.00
14.	Mercedes La Ceiba	467.00
15.	Jerusalén	793.00
16.	San Emigdio	1,551.00
17.	Paraíso de Osorio	2,257.00
	Total	**75,720.00**

CABAÑAS DEPARTMENT

No.	Municipality	Urban Population
1.	Sensuntepeque	12,967.00
2.	Ilobasco	10,239.00
3.	Victoria	2,328.00
4.	San Isidro	2,040.00
5.	Tejutepeque	2,040.00
6.	Jutiapa	1,144.00
	Total	**30,758.00**

Appendix N, Table No. N.2 continued

SAN VICENTE DEPARTMENT

No.	Municipality	Urban Population
1.	Apastepeque	4,097.00
2.	Guadalupe	2,295.00
3.	San Sebastian	6,218.00
4.	Santo Domingo	2,105.00
5.	Tecoluca	3,005.00
6.	Verapaz	2,147.00
7.	Tepetitán	1,089.00
8.	San Cayetano Ixtepeque	1,486.00
9.	San Lorenzo	1,789.00
10.	Santa Clara	1.427.00
	Total	**25,958.00**

Appendix N, Table No. N.2 continued

USULUTAN DEPARTMENT

No.	Municipality	Urban Population
1.	Jiquilisco	8,263.00
2.	Santa Elena	5,491.00
3.	Jucuapa	7,798.00
4.	Santiago de María	10,899.00
5.	Berlín	7,532.00
6.	Puerto El Triunfo	7,549.00
7.	Estanzuelas	3,550.00
8.	Alegría	1,803.00
9.	Jucuarán	2,280.00
10.	El Triunfo	2,867.00
11.	Nueva Granada	1,929.00
12.	Tecapán	2,144.00
13.	Mercedes Umaña	3,182.00
14.	Santa María	1,292.00
15.	San Buena Ventura	1,712.00
16.	California	1,891.00
17.	Concepción Batres	2,408.00
18.	Ozatlán	4,263.00
	Total	**22,757.00**

Appendix N, Table No. N.2 continued

SAN MIGUEL DEPARTMENT

No.	Municipality	Urban Population
1.	Chinameca	7,387.00
2.	San Rafael Oriente	6,655.00
3.	El Tránsito	8,413.00
4.	Sesorí	1,788.00
5.	Moncagua	1,911.00
6.	Uluazapa	1,699.00
7.	Quelepa	1,128.00
8.	Lolotique	3,586.00
9.	Carolina	2,223.00
10.	San Gerardo	2,066.00
11.	San Jorge	4,972.00
12.	Chirilagua	7,310.00
	Total	**19,138.00**

Appendix N, Table No. N.2 continued

MORAZAN DEPARTMENT

No.	Municipality	Urban Population
1.	San Francisco Gotera	7,576.00
2.	Jocoro	2,603.00
3.	Chilanga	1,246.00
4.	Sensembra	672.00
5.	Perquín	519.00
6.	Cantón Llano El Angel	1,741.00
7.	Jocoaitique	1,033.00
	Total	**15,390.00**

LA UNION DEPARTMENT

No.	Municipality	Urban Population
1.	La Unión	25,051.00
2.	Santa Rosa de Lima	8,408.00
3.	Intipucá	4,609.00
4.	San Alejo	4,747.00
5.	Anamorós	1,518.00
6.	Nueva Esparta	1,892.00
7.	Yoloaiquín	1,587.00
8.	Yayantique	1,433.00
9.	El Carmen	898.00
	Total	**50,143.00**

Total Population	**724,345.00**
Total Municipalities	**148.00**

APPENDIX "O"

RURAL WATER SECTION
IN THE NATIONAL RECONSTRUCTION PLAN

I. NAME OF THE PROGRAM

REHABILITATION OF WATER SYSTEM FOR THE SUPPLY OF POTABLE WATER AND SANITATION IN RURAL ZONES, MARKED WITHIN THE NATIONAL RECONSTRUCTION PLAN.

II. DESCRIPTION OF THE PROGRAM

2.1 CHARACTERISTICS OF THE PROGRAM

The program to be developed includes the rehabilitation of projects for Introduction of Potable Water and Latrines located in zones that were affected by the war and because of this situation have not received adequate maintenance for their good operation.

There are 119 projects within this program and different problems were identified for each of them with the following results:

- 24 are completely inactive, they did not receive any type of maintenance.
- 64 have a high system deficiency percentage, they did not receive any type of maintenance.
- 31 show certain system deficiencies; low maintenance coverage.

The projects identified are located in the following manner:

- Occidental Region	18
- Central and Metropolitan Region	36
- Paracentral Region	27
- Oriental Region	38
Total	119

In general terms, in both gravity and pump systems, the rehabilitation work to be done are under the following titles: substitution of pipes in adduction, impelling and distribution lines; suction and storage tanks; well drilling; change of pumping equipment and electric substations, etc.

C77,829.202
---------- = C2,875.53 per family
27,066 $ 359.00 per family

X. INVESTMENT FINANCING REQUIRED

It will be subject to the criteria of the financing institutions that will provide the investment.

PROJECTS TO BE REHABILITATED IN THE WHOLE COUNTRY

Region	No. of Aquedu.	No. of Munic.	No. of Commun.	Population Benefited	Cost (C)
Occidental	18	11	32	39,895	7,325,985.40
Central and Metropolitan	37	28	60	48,129	12,039,309.92
Paracentral	27	16	52	32,294	11,952,821.43
Oriental	37	29	66	42,080	17,307,951.22
Total	119	84	210	162,398	48,626,067.97

The investment cost in dollars amounts to US$6.1 millions.

APPENDIX "P"

INVENTORY OF NEIGHBORHOOD ROADS

Complete one form for each of the vecinales in the municipality outside the municipal and canton towns. The totals of all sheets for the municipality will show the whole of the vecinales in the municipality plus new roads required and trails to be upgraded.

Date_____

Department_____

Municipality_____

Road connecting_____
(Canton or caserio, one end of road)

And_____
(Canton or caserio, other end of road)

Other Cantons or Caserios on the road between the ends of the road

_____

Length of road _____ Kilometers

Road is paved [ ] YES [ ] NO

Conditions [ ] GOOD [ ] FAIR [ ] BAD [ ] VERY BAD
[ ] NOT PASSABLE BY MOTOR VEHICLE

Has repair of the road been requested in open town meeting?
[ ] YES [ ] NO

Is repair of this road scheduled by the municipality and CONARA?
[ ] YES [ ] NO

Is this an existing road? [ ] YES [ ] NO

Is this a new road to be built? [ ] YES [ ] NO

Is this a foot trail or horse and cart path to be upgraded?
[ ] YES [ ] NO

How many new bridges are needed on this road? _____

_____

_____
SIGNED

APPENDIX "Q"

SOME NOTES ON LESSER ROAD CONSTRUCTION AND MAINTENANCE

Problems observed on lesser roads are almost without exception drainage problems of one kind or another, or are made worse by poor drainage. When maintenance of drainage ditches and structures is ignored, as has inevitably been the case for several years, roads deteriorate rapidly.

The damage takes two forms, due to two different actions of water.

Dirt roads are susceptible to surface damage due to erosion when water flows in and along the road or across the road. This is a primary cause of large rock exposed in the roadway as well as deep ruts and ditches in the road. The roads are susceptible also to base failure and sogginess which can make sections of road impassable if water stands in the roadway or in ditches along side the road, or if springs flow under or onto the road so as to keep the road continuously wet.

All of these conditions have been observed repeatedly on all classes of lesser rural roads.

Surface erosion due to flowing water can never be eliminated completely, so maintenance of the road surface is a constant and never-ending requirement. Erosion can be reduced, however, by keeping water off the road to the maximum feasible extent, and by getting it off as quickly and often along the roadway as possible.

- Side ditches must be carefully built and continuously maintained, clogged ditches must be opened as soon as they are found, even during a rainstorm if possible. It should go without saying that roads must be properly crowned; that is, high along the centerline and lower around the shoulders.

- In worst cases, such as on hillsides, it has been observed that paved side ditches do a very good job of protecting dirt roads if the ditches are emptied to the side frequently and are maintained properly. But they are useless if clogged. That effect, too, has been observed.

- In cases of small streams crossing the road, or uphill side ditches draining across the road, the fords or cross drains should be paved. Culvert pipe or concrete culverts are a good solution, but unless they are big enough to carry the maximum runoff they can do more harm than good. In many cases in rural El Salvador it will be better to accept the surface drainage across dirt road at

carefully designed, usually natural, locations and pave the crossings with stone or concrete. The paved section must be long enough along the road to minimize erosion at the ends.

- In cases where roads are saturated by springs, or other standing water that cannot be intercepted and removed by side ditches, there are two possibilities. One is several deep drain pipes across the road to daylight to get rid of the water and dry the road. If that is impractical, about the only possibility is to dig out the road bed to a depth of up to a meter, haul the mud away and fill the resulting hole with large rock, with smaller rock, gravel and earth toward the top. Logs or precast concrete poles laid across the road, "corduroy road", work too, but probably is not practical here. It does no good to pave or lay rock on the surface of such soft spots without getting rid of saturated material below.

Dirt and gravel roads require regular and frequent maintenance of drainage systems and the road surface. During the rainy season, roads should be patrolled after every rain, daily if necessary, so minor clogs of the drainage ditches can be opened before they cause a major problem.

One way to do this is for DGC department residents and mayors to appoint, and pay, persons in each canton to patrol prescribed sections of road after every rain storm, to correct such problems as they can, and to report to higher authority those that they cannot. The role and authority of department resident should be strengthened and he then be held accountable to DGC for conditions of department roads. (This may be partially intended now, but he cannot be held accountable unless he has full authority to purchase and to hire and fire under MOP/DGC regulations.)

That is the way county dirt and gravel roads are maintained in at least some western states in the U.S., and it works.

In any event, maintenance planning, programs, and budgets must be developed and improved quickly nationwide if the country is to receive optimum benefit from the current lesser road rehabilitation program.

El Salvador is fortunate in that the soils of which its road are built are not often boggy or slick, (a few exceptions have been observed) but it does erode easily. Proper design, construction, and especially maintenance are critically important.

APPENDIX "R"

TABULATION OF PARTIAL RESPONSE BY MAYORS
CONCERNING STATE OF THEIR MUNICIPALITIES

PRELIMINARY RAW DATA

Department/ Municipality	No. of Neighborhood Roads	Km. of Neighborhood Roads	Pass.	Bad	Not Pass.	No. of Cantons	No. of Caserios & Cantons Not Accessible
Cuscatlán							
San José Guayabal	9	5		5	10	10	6
Tenancingo	10	20			X	10	3
Suchitoto	92	724	55	32	5	29	5
El Rosario	--	--	--	--	--	--	--
Santa Ana							
Masahuat	10	60	4		6	5	6
Santa Rosa Guachipilín	20	60	2	8	10	6	20
Texistepeque	30	80	10	15	5	6	30
La Libertad							
San Matías	3	52			13 Km	8	10
San Juan Opico	24	40	4	18	2	27	1
Quezaltepeque							
San Pablo Tacachico							
San Salvador							
Tonacatepeque	10	21	21	5	--	8	5
Aguilares							
El Paisnal	16	65	6	7	3	14	3
Nejapa	23	159 ?	6	8	9	8	9
Apopa	11	80	11			8	

Department/ Municipality	No. of Neighborhood Roads	Km. of Neighborhood Roads	Pass.	Bad	Not Pass.	No. of Cantons	No. of Caserios & Cantons Not Accessible
Morazán							
Gotera	20	50	13	5	2	6	0
Sociedad	40	200	6	24	10	8	34
Yamabal	6	40	1	1	4	4	2
Perquin	4	40		4		3	12
Torolá	7	32			7	4	17
Meanguera	4	64	2	1	1	4	2
Arambala	5	31	1	3	1	2	9
Joateca	10	60		6	4	3	13
Gualococti	14	44			14	2	All
Cacaopera	35	100	3	--	32	6	32
Guatajiagua	8	120	1	--	7	6	7
San Simón	47	166	--	45	2	6	2
Corinto	17	200	3	10	4	5	14
Sensembra	7	24	2	3	2	--	2
Jocoaitique	9	75	1	--	9	2	13
Delicias de Concepción	14	53	--	10	4	2	1
Yoloaiquin	20	50	5	8	7	2	12
Oscicala	17	59	3	6	8	4	7
San Isidro	10	14	1	6	3	2	
San Miguel							
San Luis La Reina	15	50	3	6	6	4	10
San Antonio	13	75	--	3	10	2	2
Carolina	9	45	2	4	2	5	13
San Gregorio	4	45	--	4	--	4	4
Chapeltique	15	31	6	6	3	6	2
Sesori	30	120	60	40	20	11	80

APPENDIX "S"

ALTERNATE POSSIBLE OBJECTIVES
OF INFRASTRUCTURE SEGMENT OF PRN AND PROJECT NO. 394

(COMPARE WITH APPENDIX R)

1. Functioning water systems in 46 municipal towns where ANDA does not operate by the end of the project.

2. Every canton of all 115 municipalities accessible by motor vehicle twelve months a year from the municipal town, by year "S".

3. Every municipal town accessible to the department capital twelve months a year, by motor vehicle, by year "P".

4. All fords on all streams where road closed by high water more than "X" hours per year replaced with bridges by year "Y".

5. All stream crossings without bridges to be paved with concrete slabs over suitable drain pipes by year "Q".

* 6. A well organized and funded road maintenance organization in place in every department, with sub-offices in every municipality by year "R".

7. Every caserío accessible by motor vehicle from a canton or the municipal town except when stream crossings flooded during the rainy season.

---

* This type of organization puts elected officials in touch with the people, and is an effective way to solve local problems with local people.

APPENDIX "T"

COMPARISON OF POPULATION PROJECTIONS
AND RURAL WATER COSTS 1992-1997
USING THREE DIFFERENT ESTIMATES
OF POPULATION AND RATE OF INCREASE

1. ANDA

	1991	% of Total	1992 (Calculated)	% of Total
Total Population	5,375,045	100%	5,487,798	100%
Urban	2,640,800	49.13%	2,722,929	49.62%
Rural	2,734,245	50.87%	2,764,869	50.38%

Annual Rate of Growth, Average for 5 previous years

Total	2.07%
Urban	3.11%
Rural	1.12%

2. WASH

	1990	% of Total	1991 (Calculated)	% of Total	1992 (Calculated)	% of Total
Total Pop.	5,100,000	100%	5,256,100	100%	5,417,133	100%
Urban	2,500,000	49.02%	2,562,500	48.75%	2,626,563	48.49%
Rural	2,600,000	50.98%	2,693,600	51.25%	2,790,570	51.51%

Annual Rate of Growth

Total (calculated, 1990 to 1991)	3.06%
Urban	2.5%
Rural	3.6%

3. USAID/HPN - 1992 ESTIMATE

Total Population: 5,600,000

Annual Growth: 29.32 per 1,000 = 2.932%

HPN was not asked to provide an estimate of the breakdown between urban and rural population, but use of average of WASH and ANDA yields the following for 1992.

1992 Total Population	5,600,000	100%
Urban	2,747,360	49.06%
Rural	2,852,640	50.94%

COMPARISON OF FIVE YEAR PROJECTIONS OF POPULATION
FROM THE THREE ESTIMATES

Agency/ Annual Increase	1992	1993	1994	1995	1996	1997
ANDA						
Total	5,487,798	5,603,448	5,722,070	5,843,774	5,968,625	6,096,722
***3.11% Urban	2,722,929	2,807,612	2,894,929	2,984,961	3,077,793	3,173,513
***1.12% Rural	2,764,869	2,795,836	2,827,149	2,858,813	2,890,832	2,923,209
WASH						
Total	5,417,133	5,583,258	5,754,641	5,931,453	6,113,871	6,302,079
2.5% Urban	2,626,563	2,692,227	2,759,533	2,828,521	2,899,234	2,971,715
3.6% Rural	2,790,570	2,891,031	2,995,108	3,102,932	3,214,637	3,330,364
USAID/HPN						
Total	5,600,000	5,764,000	5,932,968	6,106,004	6,285,734	6,469,905
* 2.93% Urban	** 2,747,360	2,827,858	2,910,714	2,995,998	3,083,781	3,174,135
* 2.93% Rural	** 2,852,640	2,936,222	3,022,254	3,110,806	3,201,953	3,295,770

* Equal growth rate assumed; not provided by HPN. This is rationalized by assuming that any higher growth rate in rural areas will be counterbalanced by net migration from rural areas to cities.

** Assumed to be average of ANDA and WASH estimates of urban-rural distribution.

*** Average for last 5 years, per ANDA Boletin Estadistico No. 13 for 1991.

<u>INVESTMENT IN RURAL WATER/SANITATION IN 5 YEARS TO PROVIDE SERVICE FOR THE INCREASE IN RURAL POPULATION IN 5 YEARS; 1992-1997</u>:

ANDA-Projection: For Increase in Rural Population Only: $20,000,000
WASH-Projection: For Increase in Rural Population Only: $67,500,000
HPN -Projection: For Increase in Rural Population Only: $55,400,000

<u>PROJECTIONS OF INVESTMENT REQUIRED FOR POPULATION INCREASE, ENTIRE COUNTRY, 1992-1997</u>:

ANDA-For Increase in National Population Only: $ 76,115,500, 5 yrs.
WASH-For Increase in National Population Only: $110,618,500, 5 yrs.
HPN -For Increase in National Population Only: $108,738,000, 5 yrs.

APPENDIX "U"

LBII REPORT OF 6 JANUARY 1992 TO DGC
OF REHABILITATION/CONSTRUCTION NEEDS OF RURAL ROADS

TERTIARY, RURAL "A", RURAL "B" ROADS
IN EX-CONFLICTIVE ZONE
REPORTED FROM ROAD INVENTORY
TO REQUIRE REHABILITATION OR RECONSTRUCTION

Department	Km. Total All 3 Classes	Cost $000
1. Cabañas	35.3	6,750
2. Chalatenango	152.2	2,850
3. Cuscatlán	34.4	650
4. La Libertad	104.1	1,975
5. La Paz	55.0	1,020
6. La Unión	91.4	1,750
7. Morazán	88.5	1,670
8. San Miguel	193.3	3,660
9. San Salvador	97.6	1,930
10. Santa Ana	52.8	1,000
11. San Vicente	166.9	3,200
12. Usulután	293.6	5,600
Totals	**1,682.8**	**32,055**

Source: This summary extracted from LBII Report to Division of Planning and Projects dated January 6, 1992. The document from which these figures extracted is shown in the following pages of this Appendix.

Costs estimated by the author.

Note that this table includes only those roads that are part of the DGC/Caminos national network.

It does not include caminos vecinales.

January 6, 1992 GG 157/L-550

Eng. Roque Rodas
Manager
Division of Planning and Projects
General Directorate for Roads

RE: Contract No. 519-0320-C-00-337-00
Public Services Improvement Project
Priortization of Highway
Rehabilitation/Reconstruction Needs-
Unpaved Roads.

Dear Eng. Rodas:

With this letter, we are sending you the Report of Priortized Needs for Highway Rehabilitation/ Reconstruction of Unpaved Roads, made with SIAMV, so it can be taken into account in the General Directorate for Roads' planning process.

The report is organized by Department and type of road (class 3 roads = tertiary roads, class 4 roads = modified tertiary roads, class 5 roads = rural "A" roads and class 6 roads = rural "B" roads) and lists candidate roads for rehabilitation in descending order of maintenance needs or what amounts to the same, ascending order of the condition index. Only those roads requiring rehabilitation/construction on more than 50 per cent of its length, according to the data processing of the road inventory for 1991, appear in the list.

To assist with the future selection of projects, the report also provides traffic information; if a road actually presents heavier traffic volumes than those designed for its class, an "S" appears in the column "Excessive Traffic" of the report. Roads with heavy traffic volumes must receive especial attention in planning road rehabilitation and improvement, given their potential to provide relatively high benefits (vehicle operation savings). An exception: traffic information is available for only 20% of the unpaved road network.

The enclosed report most updated every year after the processing the information from the annual inventory of road conditions. Personnel in your Division has been trained in the use of the necessary software.

I remain,

Very truly yours,

LOUIS BERGER INTERNATIONAL, INC.

Fernando Montenegro
Highway Specialist

cc: Eng. Juan F. Bolaños, DGC Director
Eng. Francisco Durán, Regular Budget Director, DGC
Eng. Eloy Quan Sham, Extraordinary Budget Sub-director, DGC
Eng. José Ramos Chorro, AID

NECESIDADES DE REHABILITACION
DEPARTAMENTO AHUACHAPAN

CODIGO	NOMBRE VIA	TRAF.EXC	LONGITUD	NS
CLASE DE VIA: 3				
8DS	CA:2-CARA SUCIA-R(GARITA PALM.	N	6400	R
15DS	APANECA-SAN PEDRO PUXTLA	N	15000	R
16DS	PALO PIQUE-LOS HORCONES-EL TIG	N	9200	R
14DS	CA:8-AGUA CALIENTE-ATIQUIZAYA	N	16400	R
7DS	CA:2-GUAYAPA-EMBARCADERO DE GU	N	3150	R
13DS	CA:2-LA HACHADURA-EL GUAYABO-G	N	15300	R
CLASE DE VIA: 5				
22DS	SAN PEDRO PUXTLA-GUAYMANGO	N	8900	M
28DS	R(STA.ANA-AHUACHAPAN)-PEPENANC	N	10600	M
24DS	EL REFUGIO-EL SALITRERO-EL ARA	N	6000	R
25DS	ATIQUIZAYA-LAS IGUANAS-EL CIPR	N	10800	R
31DS	EL REFUGIO-ATIQUIZAYA(CAMINO A	N	5200	R
32DS	R(S.ANA-AHUACH.)-TURIN-ATIQUIZ	N	12000	R
27DS	AHUACHAPAN-AS-COYOTERA-RIO FRI	N	8900	R
23DS	AHUACHAPAN-LOS AUSOLES-TACUBIT	S	6900	R
37DS	(LAS CHINAM.-ATIQUIZ.)-CANTON	N	4000	R
26DS	EL REFUGIO-ESTACIONAM.FERROCAR	S	5300	R
29DS	R(AHUACH.-TACUB.)-L.PUERTA-L.P	N	3200	R
30DS	PEPENANCE-LA ESPERANZA	N	2400	R
1316DS	VERANERA-BOLA DE MONTE-R(G.PAL	N	5800	R
CLASE DE VIA: 6				
81DS	CA:2-EL PORVENIR	N	8500	MM
49DS	LA HACHADURA-RIO PAZ	N	4700	MM
99DS	SN.FCO.MENENDEZ-CANTON GOLONDR	N	4000	MM
89DS	R(TAC.-SN.FCO.MENENDEZ)-MAISTA	N	7000	MM
101DS	R(TAC.-SN.FCO.MENENDEZ)-EL TAM	N	6000	MM
108DS	RAMAL(AHUACHAPAN-TACUBA)-CRIO.	N	4600	MM
96DS	R(ATAC.-L.CANOAS)-C.DE ZINC-VA	N	6000	MM
50DS	JUJUTLA-ROSARIO-LAS DELICIAS	N	14500	M
45DS	R(S.ANA-AHUACH.)-IZCAQUI.-R(E.	N	700	M
74DS	ATACO-SAN JOSE	N	6000	M
100DS	SN.FCO.MENENDEZ-CANTON TAMASHA	N	2000	M
72DS	CA:2-CUILAPA ARRIBA-CUILAPA AB	N	6000	M
48DS	CA:2-FRONT.-PTE.ARCE-EL JOCOTI	N	9700	M
52DS	CA:8-RIO PROFUNDIS-RIO PAZ	N	3000	M
38DS	CA:8-SAN RAMON-EL CACHAL-L.D.	N	8600	M
51DS	TACUBA-EL CHAGUITE-LOS CARPATO	N	10000	M
66DS	LAS IGUANAS-GUEVEAPA	N	800	M
98DS	CA:2-LA PALMA-CANTON STA.ELENA	N	5000	M
54DS	CA:8-SAN LUIS-LOS AMATES	N	7300	M
92DS	LOS AUSOLES-CANTON LOS MAGUEYE	N	3200	M
46DS	EL COROZO-CARA SUCIA-CA:2(EL I	N	4800	M
69DS	R(AHUACHAPAN-TACUBA)-LA CEIBA	N	5000	M
39DS	CA:8-PALO VERDE	N	3700	R
41DS	R(S.ANA-AHUACHAPAN)-JOYA DEL I	N	1500	R
58DS	R(STA.ANA-AHUACHAPAN)-RINCON V	N	5100	R
73DS	AGUA CALIENTE-GUASCOTA-SAN LOR	N	4400	R
75DS	ATACO-LOS PLANES	N	4000	R

NECESIDADES DE REHABILITACION
DEPARTAMENTO AHUACHAPAN

CODIGO	NOMBRE VIA	TRAF.EXC	LONGITUD	NS
CLASE DE VIA: 6				
77DS	ATACO-LAS PENAS	N	4500	R
84DS	TURIN-PILA EL NARANJO-EL TORTU	N	6100	R
87DS	RINCON GDE.-DOS BARRANCAS-J.EL	N	1200	R
93DS	INTERC.(S.ANA-AHUACH.)KM.91(EL	N	600	R
97DS	PILA SECA-EL CHAYAL	N	1000	R
103DS	AHUACHAPAN-APUNIA	N	1600	R
107DS	(AHUA.-L.AUS.)-C.STA.LUCIA-C.S	N	4400	R
42DS	TURIN-PARAISO-PILA DEL NARANJO	N	4200	R
94DS	PUENTE ESCALANTE-LLANO DE DONA	N	2800	R
106DS	AHUACHAPAN-CHIPILAPA	N	5000	R
43DS	R(S.ANA-AHUACHAPAN)-EL CHAYAL-	N	6000	R
47DS	APAN.-QUEL.-L.MALINCH.-QUEZAL.	N	11400	R
44DS	R(S.ANA-AHUACH.)-STA.ROSA-J.DE	N	6700	R
83DS	R(ATIQUIZ.-LAS IGUAN.-EL CIPR.	N	4300	R
56DS	CA:2-AHUACHAPIO-EL REFUGIO-SN.	N	12300	R
60DS	R(L.HUATAL.-TAC.)-2 DE MAYO-LO	N	3700	R
109DS	CA:8-ARCO DURAN-LAGUNA EL ESPI	N	2100	R
64DS	R(GUAYM.-L.D.)-SN.ANDRES-ISTAG	N	6600	R
85DS	GUAYMANGO-CACHAGUA	N	1100	R
86DS	EL REFUGIO-CANTON SAN JUAN-EL	N	5700	R
63DS	EL REFUGIO-PASO LAS FLORES	N	3500	R
61DS	TACUBA-LAS COLINAS	N	3300	R

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NECESIDADES DE REHABILITACION
DEPARTAMENTO CABAÑAS

CODIGO	NOMBRE VIA	TRAF.EXC	LONGITUD	NS
CLASE DE VIA: 3				
654DS	ILOBASCO-TEJUTEPEQUE-CINQUERA-	N	22500	MM
659DS	VILLA VICTORIA-SAN PEDRO-EL PA	N	15000	M
660DS	TEJUTEPEQUE-JUTIAPA-CERRON GRA	N	12000	M
657DS	SENSUNTEPEQUE-ROJAS-VILLA VICT	N	11000	R
658DS	PRESA 5 DE NOVIEMBRE-NOMBRE DE	N	7000	R
CLASE DE VIA: 5				
662DS	VILLA DOLORES-CHAPELCORO	N	10600	MM
661DS	AGUA-ZARCA-GUACOTECTI-SENSUNTE	N	5600	R
663DS	SENSUNT.-AGUA ZARCA-DV.E/RODEO	N	11400	R
664DS	VILLA DOLORES-CANTON SAN CARLO	N	14000	R
665DS	R(V.DOLORES-S.CARLOS)-NIQUERES	N	8300	R
667DS	ILOBASCO-BARRIO S.MIGUEL-CRIO.	N	1300	R
668DS	ILOBASCO-BARRIO S.MIGUEL-CTON.	N	3600	R
669DS	R/(S.R.CEDROS-ILOBASCO)-CTON.A	N	300	R
666DS	R(DV.ILOBASCO-LA QUESERA)-CTON	N	8100	R
CLASE DE VIA: 6				
683DS	R(VICTORIA-S.PEDRO-E/PALOMAR)-	N	13000	MM
700DS	S.FCO.IRAHETA-CTON.STA.CRUZ-R.	N	7000	MM
705DS	R(ILOBASCO-S.ISIDRO)-CTON.EL I	N	6000	MM
689DS	SAN ISIDRO-POTRERO BATRES	N	9000	MM
677DS	R/(SENSUNT.-L/MARIAS K.5.6)-NO	N	16000	MM
720DS	V.DOLORES-HDA.S.BRUNO-ARGAIN-R	N	4300	M
682DS	VICTORIA-CRIO.STA.CATARINA-AZA	N	16100	M
699DS	AZACUALPA-LAS HUERTAS-SAN JOSE	N	18000	M
685DS	R/(ILOBASCO-L/QUESERA)-CTON.MA	N	8000	M
672DS	DESVIO AZACUALPA KM.5-EL CARME	N	9000	M
679DS	CTON.AZACUALPA-SAN FRANCISCO D	N	7000	M
670DS	R/(S.ISIDRO-SENSUNTEPEQUE)-L.D	N	6000	R
674DS	S.ISIDRO-JUNQUIYAL-F.AMARILLA-	N	6000	R
676DS	CRIO.LA TEJERA-DV.PRESA 5 DE N	N	6300	R
678DS	DV.CTON SAN LORENZO-EL RODEO	N	3000	R
681DS	R(VILLA DOLORES-SENSUNTEPEQUE)	N	5000	R
684DS	LOS MENJIVAR-LOS HOYOS	N	4000	R
686DS	R/(ILOBASCO-PRESA 5 D/NOV.)-CT	N	6000	R
687DS	R/(S.R.CEDROS-ILOBASCO)K49-CTO	N	3000	R
688DS	ILOBASCO-CRIO.L/LLANITOS-CTON.	N	2000	R
703DS	R(ILOBASCO-SAN ISIDRO) EL AMAT	N	2000	R
704DS	R(S.ISIDRO-SENSUNTEP.)-LLANITO	N	4000	R
706DS	CTON.BANANERO-PALO BONITO	N	3200	R
707DS	R(ILOBASCO-SENSUNTEP.)-CUNCHIQ	N	13800	R
709DS	SENSUNTEPEQUE-CTON.LL.GRANDE-L	N	10600	R
710DS	VILLA DOLORES-CTON.CURAREN	N	2000	R
711DS	R(V.DOLORES-L.D.S.VICEN.)-CTON	N	6000	R
712DS	DV.EL DORMILON-CANTON SAN LORE	N	2000	R
713DS	R(ILOBASCO-S.J.ORATORIO)-CRIO.	N	3100	R
714DS	R(S.FCO.IRAHETA-POTRERI.)-CRIO	N	2400	R
717DS	CRIO.EL MILAN-CRIO.CIMA DE LOS	N	4200	R
a6H 718DS	R(ILOBASCO-SENSUNTEP.)KM. 81.7	N	2700	R

NECESIDADES DE REHABILITACION
DEPARTAMENTO CABAÑAS

CODIGO	NOMBRE VIA	TRAF.EXC	LONGITUD	NS
CLASE DE VIA: 6				
719DS	GUACOTECTI-SAN MARCOS-CTON.BAN	N	1500	R
1315DS	R(S.R.CEDROS-ILOBASCO)-CRIO.EL	N	4100	R

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NECESIDADES DE REHABILITACION
DEPARTAMENTO CHALATENANGO

CODIGO	NOMBRE VIA	TRAF.EXC	LONGITUD	NS
CLASE DE VIA: 5				
350DS	R(CHALAT.-CA:4) E/TABLON-S.RAF	S	42000	MM
352DS	R(CHALAT.-L/VUELTAS)-S.J.L/FLO	N	28500	MM
364DS	SAN MIGUEL DE MERCEDES-CTON.EL	N	3000	M
359DS	CHALATENANGO-CHIAPAS	N	5500	M
357DS	EL/ /GRAMAL-POTONICO-S.JOSE CA	N	13200	M
365DS	TRAMO STA.RITA-LOS SITIOS ARRI	N	2500	R
362DS	R(NVA.CONCEP.-POTRERO S.)-LAG.	N	4500	R
CLASE DE VIA: 6				
1328DS	R(CA:4-CHALAT.)CRIO.TOTOLCO-MO	N	4000	MM
391DS	CITALA-SAN RAMON-L.D.SANTA ANA	N	22000	M
416DS	R(S.FCO.LEMPA-S.L.DEL CARMEN)	N	2000	M
1327DS	R(CHALAT.-S.FCO.LEMPA)CTON.AMA	N	2000	M
412DS	R(NVA.CONCEPCION-E/MATAZANO)-E	N	6700	M
418DS	LA LAGUNA-CANTON LOS PRADOS	N	6000	M
379DS	R(L.LAGUNA-E/CARRIZAL)VAINILLA	N	4000	M
397DS	AGUA ZARCA-EL JUTE-CA:3 ARRACA	N	6000	P
425DS	R(CA:3 METAYATE-GRANJA)-CTON.L	N	3300	B

NECESIDADES DE REHABILITACION
DEPARTAMENTO CUSCATLAN

CODIGO	NOMBRE VIA	TRAF.EXC	LONGITUD	NS
CLASE DE VIA: 5				
553DS	ISTAGUA-ORATORIO D/CONCEPCION-	N	11200	M
1333DS	CA:1 KM.20-CANTON BUENOS AIRES	N	700	R
545DS	ESTACION FENADESAL-SAN CRISTOB	S	4000	R
CLASE DE VIA: 6				
558DS	R/(S.RAF.CEDROS-ILOBASCO)-L.D.	N	1000	MM
599DS	R/(STA.C.MICHAPA-TENAN.)-CTON.	N	4000	MM
588DS	R/(CA:1-S.P.PERULAPAN)-CTON.EL	N	2000	MM
641DS	R/(S.MARTIN-SUCHITOTO)L/LAUREL	N	3000	MM
574DS	R/(ISTAGUA-MONTEPEQUE)-CANTON	N	3000	MM
624DS	EL ROSARIO CUSCATLAN-CANTON AJ	N	6400	MM
632DS	R/(S.CRISTOBAL-S.FCO.)-DVIO.SA	N	4000	M
643DS	CANTONES SAN ANDRES-OJOS DE AG	N	3300	M
571DS	R/(S.MARTIN-SUCHITOTO)-CTON. L	N	2000	M
597DS	R/(STA.CRUZ MICHAPA-TENAN.)-CO	N	3200	M
598DS	R/(STA.CRUZ MICHAPA-TENAN.)-RO	N	4000	M
613DS	ORATORIO DE CONCEPCION SAN JOS	N	5200	M
631DS	CANTONES EL AMATILLO-SAN MARTI	N	2500	M
648DS	R/(CA:1-COCO VERDE)-CTONES.E/C	N	2500	M
1335DS	(COJUTEP.-S.RAMON)R/(BO.S.JOSE	N	1500	M
1365DS	R/(S.R.CEDROS-ILOBASCO)-S.J.LA	N	1000	M
1366DS	R/(CA:1 KM 23-TECOLUCO)-SANTA	N	2800	M
567DS	CA:1 KM.41-CTON.COCO VERDE-EL	N	4400	M
566DS	RIO S.P.PERULAPAN-CTON.RODEO-C	N	3600	M
572DS	CANTON BUENA VISTA-CANTON MICH	N	2800	M
573DS	RAMAL (ISTAGUA-MONTEPEQUE)-EL	N	6000	M
642DS	CA:1 KM.34.5 COJUTEPEQUE-DV. E	N	5000	M
593DS	ORATORIO DE CONCEPCION-CTON.LA	N	3100	R
637DS	CA:1 KM.28.5-CANTON CRUZ VERDE	N	3000	R
616DS	COJUTEPEQUE-CANTON EL CARRIZAL	N	3000	R
647DS	R/(COJUTEPEQUE-S.CRISTOBAL)-C/	N	6100	R
563DS	CA:1 KM.30 CANTON LAS ANIMAS	N	4100	B

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NECESIDADES DE REHABILITACION
DEPARTAMENTO LALIBERTAD

CODIGO	NOMBRE VIA	TRAF.EXC	LONGITUD	NS
CLASE DE VIA: 3				
285DS	R/(STA.TECLA-S.J.L/PLANES)-EL	N	2500	M
283DS	SANTA TECLA-TEOTEPEQUE-CA:2 KM	N	48700	M
288DS	SAN PABLO TACACHICO-L.D. SANTA	N	10000	M
280DS	LA MARINA-CHILTIUPAN-CA:2 KM.5	N	19600	M
278DS	CA:1-CANTON SANTA ROSA-SAN JUA	N	12100	R
282DS	R/(NVO.CUSCATLAN-HUIZUCAR)-SAN	N	1100	R
281DS	CA:4 ZAROGOZA-SAN JOSE VILLANU	N	4400	R
279DS	CA:2-TAMANIQUE	N	15600	R
287DS	SAN PABLO TACACHICO-EL PAISNAL	N	7500	R
CLASE DE VIA: 5				
291DS	SAN MATIAS-LA LOMA	S	3000	MM
1338DS	R/(STA.ANA-SAN PABLO TACACHICO	N	19300	MM
294DS	OPICO-SAN MATIAS	N	5200	M
297DS	NUEVO CUSCATLAN-CANTON NAZARET	N	10500	M
300DS	CA:1 KM.33.9-HACIENDA ZAPOTITA	N	6200	M
295DS	LA FECHA-COMASAGUA-EL FARO-LA	N	23200	M
299DS	CA:4 KM.26 C/EL CIMARRON-C/TEP	N	2200	M
292DS	SAN JOSE VILLANUEVA-CA:2	N	12400	M
293DS	TEOTEPEQUE-JICALAPA	N	4100	M
296DS	RAMAL(ATEOS-JAYAQUE)-TALNIQUE	N	8700	M
CLASE DE VIA: 6				
315DS	JICALAPA-EL TABLON-CHILTIUPAN	N	6000	MM
328DS	LAS DELICIAS-VALLE NUEVO	N	3000	MM
314DS	R/(SANTA TECLA-TEOTEPEQUE)-HDA	N	2000	MM
305DS	TERMOPILAS-SANTA MARIA-CA:2	N	7000	M
323DS	CA:4-LAS GRANADILLAS-LOS PAJAL	N	18300	M
303DS	JAYAQUE-JUAN HIGINIO	N	4000	M
319DS	CIUDAD ARCE-LA REFORMA-ZAPOTIT	N	3900	M
320DS	LAS FLORES-LA PUEBLA-LAS ANONA	N	4100	M
310DS	TALNIQUE-R/(TEOTEPEQUE-CHILTIU	N	4900	M
327DS	CA:2 KM.88-CANTON SIHUAPILAPA	N	7600	M
318DS	CA:2 KM.36-EL MORRAL-CANTON SA	N	4600	M
301DS	SAN JUAN LOS PLANES-QUEZALTEPE	S	11700	M
316DS	CA:2 KM.39 MAJAGUAL (CAMINO AN	N	2700	M
309DS	OPICO-CANTON SAN ANTONIO-L.D.	N	11600	M
311DS	CANTON GUADALUPE-EL NANCE-CA:4	N	2000	M
313DS	CA:2 KM.49-EL PALMAR	N	4000	M
1339DS	CA:2-CANTON TEPEAGUA	N	4600	M
304DS	RAMAL(STA.TECLA-TEOTEPEQUE)-TA	N	10600	M
317DS	QUEZALTEPEQUE-L.D. S.S.(CAMINO	N	2200	M
322DS	SAN MATIAS-EL JOCOTE-LA PUEBLA	N	8300	M
326DS	CA:4-ASUCHIO-EL TRIUNFO	N	7200	M
306DS	R/(QUEZALTEPEQUE-S.MATIAS)-LAS	N	11000	R
312DS	OPICO-CAMPO DEPORTIVO LAS COFR	N	1000	R
308DS	QUEZALTEPEQUE-PLATANILLOS	N	2700	R
324DS	CA:8 KM.24-CANTON LOURDES	N	900	R

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NECESIDADES DE REHABILITACION
DEPARTAMENTO LAPAZ

CODIGO	NOMBRE VIA	TRAF.EXC	LONGITUD	NS
CLASE DE VIA: 3				
829DS	SAN MIGUEL TEPEZONTES-LAGO DE	N	2000	M
CLASE DE VIA: 5				
844DS	STA.TERESA-S.JOSE ARRIBA-S.JOS	N	8000	MM
837DS	CA:2-LAS DELICIAS-CTON.S.SEBAS	N	9000	M
848DS	OLOCUILTA-S.SEBASTIAN-CA:2 KM.	N	11500	M
833DS	R(ZACATECOLUCA-EL NILO)-S.FCO.	N	4000	M
840DS	CA:2 KM.56-CTON.JOSESITO-S.J.L	N	9800	M
836DS	CA:2 KM.60 EL RECREO-SAN FRANC	N	17600	R
839DS	S.J.NONUAL.-E/GOLFO-L/VERANERA	N	10500	R
841DS	CA:2 COMALAPA-TAPALHUACA	S	8100	R
CLASE DE VIA: 6				
914DS	LAS ISLETAS-CTON.ACHIOTAL	N	3000	MM
889DS	R(ZACAR.-S.VICENTE)-CTON.E/ESP	N	5000	MM
891DS	R(ZACAT.-E/CHILE)-PIEDRA GRAND	N	5000	MM
918DS	R(STGO.TEXAC.-CCJUT.)-S.BARTOL	N	10000	MM
896DS	CTONES.CONCEP.LOURDES-S.JOSE C	N	7000	MM
881DS	ZACATECOLUCA-CANTON SAN LUCAS	N	3000	MM
852DS	CA:2 KM.54-LA GLORIA-EL CHILE	N	9000	MM
937DS	CTONES.S.ANTONIO ABAJO-S.ANTON	N	3500	M
886DS	CA:2 KM.57 CTON.E/ESPINO ABAJO	N	2700	M
897DS	S.JUAN TEPEZONTES-L/ESPERANZA-	N	8000	M
899DS	S.JUAN TALPA-L/HUESOS-S/LUIS T	N	2500	M
938DS	SAN RAFAEL OBRAJELO-EL COBANA	N	4400	M
868DS	TEPECHAME-R(ZACATECOLUCA-CTON.	N	4000	M
884DS	STGO.NONUALCO-S.PEDRO NONUALCO	N	11300	M
870DS	SAN JUAN TALPA-CANTON TOBALON	N	2000	R

NECESIDADES DE REHABILITACION
DEPARTAMENTO LAUNION

CODIGO	NOMBRE VIA	TRAF.EXC	LONGITUD	NS
CLASE DE VIA: 3				
1245DS	SAN NICOLAS ANCHICC-YAYANTIQUE	N	5500	M
1249DS	LA UNION-AMAPALITA-AGUA ESCOND	N	8800	M
1240DS	R/(RUTA MILITAR-ANAMOROS)-EL S	N	8100	M
1244DS	CORSAIN-PLAYITAS	N	6900	R
1246DS	CA:1-BOBADILLA-SAN AJEJO	N	11300	R
1241DS	EL SAUCE-CONCEPCION DE ORIENTE	N	21000	R
CLASE DE VIA: 5				
1253DS	R/(CA:2-PLAYA LAS TUNAS)-EL FA	N	6000	M
1252DS	CA:2-INTIPUCA-ESTERO DE CERIQU	N	5500	M
1254DS	NUEVA ESPARTA-POLOROS	N	5900	M
1259DS	YAYANTIQUE-CANTON CENTENO-CANT	N	10000	M
1256DS	ANAMOROS-NUEVA ESPARTA	S	9600	R
CLASE DE VIA: 6				
1260DS	R.MIL.-KM.175-CTON.L/CHORRERA-	N	8000	MM
1231DS	LISLIQUE-CORINTO-(TRAMO LA UNI	N	7000	MM
1322DS	CA:1 KM.190-CANTON HATO NUEVO	N	1000	MM
1283DS	SAUCE-CTON.L/VIUDAS-STA.ROSITA	N	11000	MM
1270DS	BOLIVAR-GUADALUPE-LOS MAJANITO	N	6600	MM
1291DS	CA:2-CRIO.LA LEONA-CRIO.E/COYO	N	9000	MM
1282DS	CONCHAGUA-CANTON PIEDRA BLANCA	N	3500	MM
1293DS	RUT.MILITAR CTON.ALBORNOZ-CRIO	N	6000	MM
1278DS	CA:2-EL ZAPOTE-EL OCRE	N	9000	M
1296DS	CONCEP.ORIENTE-PLAN D/L/AGUJA-	N	8000	M
1274DS	R/(CUTUCO-PLAYITAS)-PUNTA CHIQ	N	2000	M
1302DS	R/(POLOROS-MONTECA)-CANTON LAJ	N	4100	M
1284DS	R/(POLOROS-MONTECA)-CANTON LAS	N	4000	M
1261DS	R.MILITAR-RIO L/PINAS-MINA -LO	N	10000	M
1305DS	TULIMAN-EL PAPALON	N	3100	M
1290DS	CA:2-EL VOLCANCILLO	N	2800	M
1307DS	AL AMATILLO-EL TALPETATE-EL SA	N	9200	M
1273DS	CA:2-LOMA LARGA-AGUA CALIENTE-	N	13200	M
1263DS	YUCUAIQUIN-L.D.SAN MIGUEL	N	5400	R
1275DS	CA:1 SIRAMITA-EL TAMARINDO-SAN	N	14300	R
1272DS	CA:1-LA GARITA-EL PORTILLO-LOS	N	5700	R
1323DS	SAN ALEJO-CANTON BENAVIDES	N	5700	R
1303DS	CANTON MONTECA-CANTON UPIRE	N	3500	R
1321DS	CA:1 CTON.PAVANA-STA.CRUZONA-S	N	4700	R
1276DS	OLOMEGA-EL ZAPOTAL	N	5900	R

NECESIDADES DE REHABILITACION
DEPARTAMENTO MORAZAN

CODIGO	NOMBRE VIA	TRAF.EXC	LONGITUD	NS
CLASE DE VIA: 3				
1178DS	CA:7-OSICALA-SAN SIMON-SAN ISI	N	19500	R
1181DS	RAMAL(OSICALA-SAN SIMON)-GUALO	N	1100	R
CLASE DE VIA: 6				
1213DS	R(GOT.-CACAOP.)-SUNSUL.-EL OCO	N	11000	MM
1207DS	RAMAL(SAN CARLOS-L.D.)-SAN DIE	N	10000	MM
1199DS	SAN SIMON-EL CARRIZAL	N	6600	M
1192DS	YAMABAL-L.D.SAN MIGUEL	N	7800	M
1219DS	YAMAB.-J.DEL MATAZ.-CRIO.LOS C	N	13000	M
1205DS	R(RUTA MIL.-LOS LAURELES)-EL H	N	4000	M
1202DS	DELIC.D.CONCEP.-SAN CARLOS-L.D	N	16000	M
1210DS	RAMAL(RUTA MIL.-SOCIEDAD)-CTON	N	5300	M
1324DS	R.MIL.(DV.LA CASC.)-CRIO.L.ROM	N	6000	M
1211DS	RAMAL(CA:7-SOC.)-C.CACAHUATALE	N	3200	M
1215DS	R(SN.FCO.GOT.-YAMAB.)-LAS OLOM	N	5000	M

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NECESIDADES DE REHABILITACION
DEPARTAMENTO SANMIGUEL

CODIGO	NOMBRE VIA	TRAF.EXC	LONGITUD	NS
CLASE DE VIA: 3				
1071DS	CA:1-CERRO BONITO-PALO PRIETO-	N	9900	M
1075DS	CANTORA-TALPETATE-R/(EL CONSUE	N	5000	M
1068DS	CA:1-ELTRIUNFO-L/LIMONES-SESOR	N	10000	M
1070DS	CA:1-EL SITIO-EL OBRAJUELO-QUE	N	4800	R
1355DS	CHAPELTIQUE - CIUDAD BARRIOS	N	15200	R
1361DS	SAN FRANCISCO-LOLOTIQUE	N	11400	R
CLASE DE VIA: 5				
1091DS	CA:2-SAN PEDRO-NVA.CONCEPCION-	N	12000	MM
1107DS	(CA:1)- CANTON EL JUTE	N	3000	MM
1093DS	RAMAL (LA PLACITA-SAN JORGE)-C	N	7000	MM
1092DS	CHINAMECA-JOCOTE DULCE-SAN JOR	N	14500	M
1097DS	EL PLATANAR-CTON. LAS VENTAS-S	N	13800	M
1121DS	EL PROGRESO-LA PUERTA	N	2200	M
1109DS	(CA:1)-EL JOBO-MONCAGUA	N	3000	M
1081DS	CA:2-SAN CARLOS-LA PUERTA	N	7300	M
1078DS	C.BARRIOS-S/LUIS L/REINA-S/GER	N	39800	M
1095DS	CIUDAD BARRIOS-SAN ANTONIO	N	13000	M
1114DS	R/(CHINAMECA-EL PACAYAL)-CERRO	N	2300	M
1080DS	SAN MIGUEL-EL AMATE-MIRAMAR	N	8600	R
1082DS	R/(C.BARRIOS-S/LUIS DE L/REINA	N	7800	R
1084DS	CHAPELTIQUE-POTOSI-SESORI	N	16000	R
1089DS	CHINAMECA-EL PACAYAL-LA -PLACI	N	10000	R
1087DS	CA:2-EL BRAZO-PASO DE LAS IGUA	N	5800	R
1101DS	COMACARAN-ULUAZAPA	N	4400	R
CLASE DE VIA: 6				
1157DS	CA:2-LAGUNA JOCOTAL-KM.132.2	N	2700	MM
1138DS	TIERRA BLANCA-LA ESTRECHURA	N	3500	MM
1164DS	CA:7-HATO NUEVO-TAMARINDO-LAS	N	8000	M
1140DS	CHIRILAGUA-JUCUARAN	N	8400	M
1141DS	S.LUIS D/L/REINA-CTON.S/ANTONI	N	7000	M
1152DS	CAROLINA-SANTA CLARA	N	4100	M
1153DS	CANTON SAN JACINTO-EL ALTOMIRO	N	5400	M
1129DS	CIUDAD BARRIOS-CANTON EL NUEVO	N	5000	R
1148DS	NUEVO PORVENIR-CASERIO ANTIGUO	N	4000	R
1167DS	CHAPELTIQUE-CRIO.PAPALONES-CT.	N	3800	R
1362DS	CA:2-LA ESTANCIA	N	6500	R
1151DS	CHINAMECA-CANTON EL JOBO	N	9000	R
1132DS	SAN MIGUEL-LAS DELICIAS-DVIO.U	N	8300	R

NECESIDADES DE REHABILITACION
DEPARTAMENTO SANSALVADOR

CODIGO	NOMBRE VIA	TRAF.EXC	LONGITUD	NS
CLASE DE VIA: 3				
454DS	(SAN MARTIN-TONACATEPEQUE) CTO	N	1900	M
455DS	VENECIA-PLAN D.PINO-SN.J.CORTE	S	7900	M
452DS	RAMAL(MARIONA-NEJAPA)-CANTON G	N	3500	M
446DS	CA:4 AGUILARES-EL PAISNAL L.D.	N	16900	R
450DS	SANTIAGO TEXACUANGOS - L.D. LA	N	3600	R
CLASE DE VIA: 5				
467DS	PLAN DEL PITO-CTON.CHANCALA-AY	N	6000	MM
468DS	MIL CUMBRES-LA CEIBA-CTON.EL C	N	4500	M
465DS	R(L.PL.D.REN.-PTA.D.DIA.)EL GU	S	3200	M
462DS	CA:1 KM.12-CTON.VER.-R(SN.MAR.	N	5400	M
464DS	MEJICANOS-SAN JUAN LOS PLANES-	N	12800	M
461DS	MIL CUMBRES-QUEZALAPA	N	2600	M
469DS	CA:4 KM.14-CA:4 KM.16 1/2(CAM.	N	2000	M
466DS	LOS PLANES-CASA DE PIEDRA-LOMA	N	4700	R
CLASE DE VIA: 6				
490DS	COL.HARRISON STOP-CERRO SN.JAC	N	5000	MM
508DS	CORINTO-CTON.EL SAUCE-SAN MART	N	4000	MM
476DS	TONACATEPEQUE-LAS CABANITAS	N	8000	MM
495DS	PALECA-BARRO BLANCO-LOS ARENAL	N	2500	MM
516DS	AGUILARES-EL PAISNAL(CAMINO AN	N	6000	MM
479DS	CA:4 KM.25-CANTON NANCE VERDE	N	4000	MM
480DS	GUAZAPA-CTON.LOMAS DE RAMOS	N	5000	MM
528DS	LOS PALONES-EL GUAJE	N	6000	MM
496DS	R(SN.ANT.AB.-COL.LISB.)-EL ALG	N	1500	M
501DS	CTON.QUEZAL.-R(PANCH.-ROS.D.MO	N	2900	M
518DS	EL JUTILLO-ROS.D.MORA-EL CARRI	N	3000	M
522DS	CTON.LAS ANIMAS D.SN.MART.-ORA	N	4000	M
500DS	SANTIAGO TEXAC.-CTON.JOYA GRAN	N	4700	M
507DS	GUAZAPA-CANTON EL BONETE-NEJAP	N	13500	M
512DS	PANCHIMALCO-ROS.D.MORA-CTON.LA	N	5400	M
517DS	PTA.D.DIAB.-MIL CUMBRES-QUEZAL	N	1100	M
475DS	AGUILARES-SEGURA	N	6000	M
505DS	PLANES DE RENDEROS-LOMA LARGA	N	1000	M
489DS	PANCHIMALCO-CANTON LOS PAJALES	N	5000	M
502DS	TONACATEPEQUE-CANTON EL SAUCE	N	5400	M
474DS	RUTA ANTIGUA-LOS PLANES-PANCHI	N	3100	M
477DS	MILINGO-EL ARENAL-MARIONA	N	3700	M
487DS	R(S.S.-COMAL.-KM.13)-DESVIO AS	N	4500	M
504DS	SAN MARTIN-CANTON SAN JOSE PRI	N	3500	M
514DS	CA:4 KM.9-PTE.EL TORIL-SN.LAUR	N	9200	M
519DS	SAN MARTIN-CEMENTERIO-DV.SN.P.	N	1500	M
520DS	ALDEA LAS MERCEDES-CANTON SUCH	N	3600	M
503DS	AYUTUXTEP.-CTON.EL PORVENIR-EL	N	7000	R
472DS	TONACATEPEQUE-RIO SILLEROS	N	5600	R
1350DS	(APOPA-QUEZALTEPEQUE)-EL SALIT	N	3000	R
509DS	SOYAPANGO-CANTON LA FUENTE	N	6500	R
492DS	R(S.S.-COMAL.-KM.15)-CANTON EL	N	1000	R
a6H 493DS	R(CA:1-APULO)-AMATITAN	N	2000	R

NECESIDADES DE REHABILITACION
DEPARTAMENTO SANSALVADOR

CODIGO	NOMBRE VIA	TRAF.EXC	LONGITUD	NS
CLASE DE VIA: 6				
497DS	CA:4 KM.25-ESTACION FERROCARRI	N	3100	R
506DS	SANTO TOMAS-CANTON EL CARMEN	N	1500	R

NECESIDADES DE REHABILITACION
DEPARTAMENTO SANTA ANA

CODIGO	NOMBRE VIA	TRAF.EXC	LONGITUD	NS
CLASE DE VIA: 3				
117DS	SANTA ANA-SAN PABLO TACACHICO(	N	19500	M
120DS	CA:12 METAPAN-TAHUILAPA	N	10000	R
CLASE DE VIA: 5				
128DS	AUTOPISTA SANTA ANA-PALO DE CA	S	20700	MM
125DS	TAHUILAPA-SANTA ROSA GUACHIPIL	N	17700	M
132DS	SAN ANTONIO PAJONAL-EL TABLON	N	4000	M
133DS	CA:1 KM.68-ANT.SECCIONAL-CA:1	S	900	M
1317DS	CANTON EL COCO-FRONTERA GUATEM	N	3750	M
134DS	ALDEA BOLANOS-SAN JERONIMO-EL	N	7400	M
129DS	CA:12 KM.80-CHALCHUAPA	S	8500	M
124DS	CA:12 KM.100-LAS CONCHAGUAS-MA	N	7000	M
122DS	CA:1 KM.79-LA PARADA-ALDEA BOL	N	3900	R
136DS	R(EL COCO-CHALCH.)-CTON.GALEAN	N	3300	R
137DS	CA:1-SAN VICENTE-EL COCO-CHALC	N	30400	R
131DS	CA:1 KM.92-STGO.D.L.FRON.-SN.A	N	14200	R
CLASE DE VIA: 6				
151DS	R(STA.A.-SN.P.TACACH.)-EL COBA	N	9000	MM
150DS	BELEN-SAN JUAN LAS MINAS	N	5000	MM
168DS	CA:1 KM.61-COPINOL.-PRIMAV.-CE	N	5000	MM
142DS	R(CA:1-LAGO D.COATEP.)-LAGO(RU	N	1600	M
159DS	CA:12 KM.79 LAS CRUCES-BUENOS	N	4200	M
173DS	CA:12 KM.72-R(LAS CRUCES-LA MO	N	3500	M
183DS	R(S.ANA-TACACH.)-CANTON SAN JA	N	1000	M
186DS	SANTA ANA-LA CHINA-LA REFORMA	N	8000	M
154DS	CA:1 KM.85-LA CRIBA	N	4400	M
177DS	GUARNECIA-CASERIO LOS JOBOS	N	1700	M
143DS	R(STA.A.-METAP.KM.83.8)-R(TEXI	N	3000	M
188DS	CA:1 KM.76-EL PINALITO-CHILCUY	N	16000	M
148DS	CHALCHUAPA-EL ARADO	N	7000	M
171DS	CA:1 KM.55-EL JOCOTON-AUT.STA.	N	3500	M
187DS	COPINOLITO-CANTON NATIVIDAD	N	1600	M
189DS	AUT.STA.ANA KM.39.2-CTON.EL TI	N	4200	M
144DS	METAPAN-MONTECRISTO-(DESVIO NU	N	21800	M
176DS	R(STA.A.-METAP.KM.81)-SN.J.DEL	N	3000	M
160DS	CA:12 KM.73-LA MONTANIOTA	N	6500	M
184DS	CA:1 KM.72.7-C.RANCHADOR-C.AYU	N	2100	M
175DS	R(STA.A.-METAP.KM.89)-CASITAS-	N	9100	M
180DS	R(S.ANA-FL.AMAR.)-LAMECA-E.CRI	N	7600	M
138DS	CA:1 KM.50.2-EL JUNQUI.-EL REF	N	9200	R
155DS	CA:1 KM.69-GRANADA DEL PINAL	N	7300	R
162DS	STA.ANA-AUT.STA.ANA-DV.FLOR AM	N	5000	R
169DS	CA:1 KM.57-EL PEZOTE-LOS ELIZO	N	5000	R
182DS	RES.ANA-TEXIST.KM.66)-SN.J.CUT	N	1500	R
190DS	INT.CA:1-CA:8 K.54(EL C.-EL Z.	N	2800	R
149DS	CA:12 KM.69-POTRERILLOS	N	6500	R
156DS	CA:1 KM.61-SN.J.BUENA VISTA-FL	N	8200	R
163DS	CA:1 KM.58-DESVIO FLOR AMARILL	N	6200	R
a6H 164DS	CA:12 KM.76-DV.SN.SEBASTIAN SA	N	7300	R

NECESIDADES DE REHABILITACION
DEPARTAMENTO SANTA ANA

CODIGO	NOMBRE VIA	TRAF.EXC	LONGITUD	NS
CLASE DE VIA: 6				
179DS	R(S.ANA-MET.KM.73)-C.CAM.-CAS.	N	13000	R
147DS	CA:12 KM.76-EL JUTE	N	8300	R
172DS	CA:1 KM.55-MALACOFF-CONCEPCION	N	4000	R
191DS	EL PORVENIR-STA.ROSA SENCA-SN.	N	6800	R
161DS	R(STA.A.-PALO D.CAMP.)-P.PACH.	N	8600	R
145DS	R(METAP.-BELEN)-SAN MIGUEL ING	N	14000	R
170DS	CA:1 KM.60-LAS CANOAS-AUT.STA.	N	1900	R
167DS	TEXIST.-CTON.COSTA RICA-EL AGU	N	3300	R
140DS	KM.76 R(STA.ANA-CHALCHUAPA)-BA	N	1000	R
166DS	R(SN.MIGUEL-EL ZUNZA)-LA ESTAN	N	2300	R
174DS	CA:12 KM.98-LAGO DE GUIJA	N	2500	R

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NECESIDADES DE REHABILITACION
DEPARTAMENTO SANVICENTE

CODIGO	NOMBRE VIA	TRAF.EXC	LONGITUD	NS
CLASE DE VIA: 3				
739DS	SANTA CLARA-SAN IDELFONSO	N	25000	MM
738DS	SANTA LUCIA-LAS ANIMAS	N	4000	M
737DS	CA:2 SAN NICOLAS LEMPA-LA PITA	N	21300	M
740DS	S.V.-NVO.TEPETITAN-VERAPAZ-JER	N	12300	B
734DS	R/(TECOLUCA-ZACATECOLUCA)-CA:2	N	10300	B
732DS	RAMAL (CA:1-SAN RAMON)-DESVIO	N	3400	B
CLASE DE VIA: 5				
746DS	CANTON LA LABOR-LOS LAURELES	N	2000	M
756DS	R(S.VICENTE-APASTEPEQUE)-TECOM	N	800	M
760DS	CRIO.EL COPINOL-CTON.EL PORVEN	N	2500	M
743DS	CA:1 KM.69 SAN FELIPE-SAN LAZA	N	12000	R
744DS	R/(CA:1-S.SEBASTIAN)-L/LABOR-E	N	3500	R
752DS	CA:1 KM.56-CTN.STA.ELENA-C.G.-	N	3000	R
750DS	R/(VERAPAZ-GUADALUPE)-SAN EMIG	N	2000	R
CLASE DE VIA: 6				
772DS	S.ANTONIO CAMINOS-S.ANTON. TRA	N	5000	MM
783DS	R/(S.IDELFONSO-TIHUILAPA)-CORL	N	12600	MM
792DS	CA:2 KM.72.2-HACIENDA SANTA TE	N	3000	MM
771DS	S.VICENTE-CHUCUYO-LA JOYA-PARR	N	18000	MM
789DS	R/(S.VICENTE-ZACATECOLUCA)-S.B	N	8000	MM
765DS	R/(S.VICENTE-TECOLUCA)-LL.ANCH	N	3000	MM
766DS	R/(S.EST.CATARINA-STA CLARA)-S	N	14000	MM
780DS	SAN ESTEBAN CATARINA-HOYO D/CA	N	8000	MM
785DS	CA:2 KM.69-SANTA CRUZ-EL PARAI	N	8000	MM
786DS	R/(CA:2-S.NICOLAS LEMPA-L/PITA	N	8000	MM
781DS	R/(CA:2-E/PALOMAR-TECOLUCA)-L/	N	5000	M
764DS	AMAPULAPA-LOS POZOS	N	2400	M
804DS	SAN ILDEFONSO-CANTON MARADIAGA	N	3500	M
1345DS	R/(S.ILDEFONSO-PTE.TITIHUAPA)-	N	4100	M
784DS	R/(S.VICENTE-ZACAT.)-S.DIEGO-C	N	4000	R
788DS	R/(CA:1-S.FELIPE)-S.JACINTO-S.	N	6000	R
808DS	(CA:1 KM.45)-CANTON LOS RODRIG	N	2000	R
798DS	NUEVO TEPETITAN-CANTON LOMA AL	N	3000	R
790DS	R/(DV.S.VICENTE-MIRAMAR)-HDA.L	N	800	B

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NECESIDADES DE REHABILITACION
DEPARTAMENTO SONSONATE

CODIGO	NOMBRE VIA	TRAF.EXC	LONGITUD	NS
CLASE DE VIA: 3				
218DS	JUAYUA-CANTON LOS CANALES	N	5000	M
213DS	CUISNAHUAT-R(S.JULIAN-STA.ISAB	N	9600	M
214DS	CA;2 KM.96-STA.ISABEL ISHUATAN	N	26700	M
212DS	S.ANTONIO D/MONTE-STO.DOMINGO	N	13700	R
215DS	ATECOZOL-IZALCO	N	700	R
219DS	CUISNAHUAT-CA:2 KM.98	N	15000	R
217DS	R(S.ANT.D/MONTE S.DGO.D/GUZMAN	N	13600	R
CLASE DE VIA: 5				
223DS	SONSONATE-NAHUIZALCO-(CAMINO A	S	5800	M
225DS	SONZACATE-CA:12-(CALLE ANTIGUA	N	1500	M
220DS	NAHUIZALCO-JUAYUA	N	7700	M
227DS	RAMAL(IZALCO-ATECOZOL)-CHORRO	N	6300	M
229DS	CA:8 KM.40-L/CRUCITAS-E/GUAYAB	N	9200	M
224DS	JUAYUA-SAN JUAN DE DIOS	N	5800	M
230DS	CA:8 IZALCO-ESTACION FERROCARR	N	3300	R
221DS	CA:12-IZALCO	N	4200	R
231DS	IZALCO-TUNALMILES	S	5400	R
233DS	CA:2-METALIO-GUAYMANGO (TRAMO	N	5300	R
228DS	R(CA:12-IZALCO)-ESCUELA IZALCO	N	3000	R
232DS	CALUCO-SANTA CRUZ	N	15500	R
CLASE DE VIA: 6				
239DS	SANTO DOMINGO DE GUZMAN-EL CAR	N	1500	MM
250DS	IZALCO-TALCOMUNCA-EL CANELO	N	11500	MM
248DS	JUAYUA-LOS ANIZALES-L.D.	N	4500	MM
237DS	SAN JULIAN-PENAS BLANCAS	N	2700	M
240DS	IZALCO-CA:8 HUISCOYOLATE(CAMIN	N	2500	M
253DS	CA:2 KM.88-CTON.EL CAULOTE-EL	N	3600	M
263DS	SAN ANTONIO DEL MONTE-LAS HOJA	N	2900	M
257DS	SAN JOSE LA MAJADA-LOS APANTES	N	4600	M
259DS	CA:2 KM 93-EL COROZAL-QUEBRADA	N	5400	M
246DS	PALO COMBO-CA:2 KM.103-EL PRES	N	1800	M
260DS	CA:2 - EL MONZON	N	1500	M
261DS	CA:2-LA ISLA-R(CA:2-EL MORA)	N	5000	M
234DS	R(IZALCO-ATECOZOL)-LA GARROBA-	N	17300	M
262DS	CALUCO-CANTON LAS FLORES	N	8200	M
247DS	CA:2 SAN PEDRO-E/SALAMO-STO.DG	N	11000	M
252DS	CA:8 KM.42-AZACUALPA-R(S.ISIDR	N	5600	M
238DS	ACAJUTLA-BOCANA EL LIMON-ATALA	N	800	R
236DS	NAHUILINGO-TAZULAT-CUISNAHUAT	N	12300	R
258DS	R(NAHUIZALCO-JUAYUA)-ANAL ABAJ	N	3000	R
249DS	CA:2-EL MORA-LOS MARIN-L.D.	N	6000	R
235DS	R(NAHUIZALCO-SONSONATE)-CA:12-	N	7400	R
243DS	CA:8-IZALCO-TRES CEIBAS	N	3600	R
245DS	SALCOATITAN-BOCADI DE FRENO-L.	N	3600	R
264DS	TRES CEIBAS-NAHUILINGO-PIEDRA	N	2000	R
251DS	SAN JULIAN-PETACAS	N	3000	R

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NECESIDADES DE REHABILITACION
DEPARTAMENTO USULUTAN

CODIGO	NOMBRE VIA	TRAF.EXC	LONGITUD	NS
CLASE DE VIA: 3				
958DS	R(CA:2-PLAYA EL ESPINO)-JUCUAR	N	9400	M
957DS	CA:2-PLAYA EL ESPINO	N	28500	M
960DS	RAMAL(BERLIN-SAN AGUST.)-QUESE	N	13000	R
955DS	BERLIN-SAN AGUSTIN-CA:2	N	26500	R
956DS	CA:2 SAN MARCOS LEMPA-LA CANOA	N	19200	R
963DS	SANTA ELENA-LAS CRUCES-SN.PDRO	N	7800	R
953DS	CA:2-PUERTO EL TRIUNFO(EL TANQ	N	7200	R
962DS	RAMAL(USULUTAN-TECAPAN)-EL JIC	N	2000	R
CLASE DE VIA: 5				
965DS	USULUTAN-UJUSTE OTE.-STA.ELENA	N	3700	M
978DS	CA:1 JOCOTILLO-LA PUERTA-ALEGR	N	7300	M
996DS	SANTA ELENA-CANTON EL AMATE	N	5100	M
973DS	CA:2 USULUTAN-SANTA MARIA	S	1000	M
974DS	JIQUILISCO-LA ERMITA-CANTON AG	N	10500	M
991DS	R(V.EL TRIUN.-SGO.MA.)-LL.GDE.	N	7400	M
981DS	TECAPAN-EL JICARO-EL POZON	N	5000	R
986DS	MERCEDES UMANA-HDA.STA.ANITA-C	N	4100	R
980DS	R(S.ELE.-JUC.)-JOYA ANCH.ARR.-	N	6300	R
CLASE DE VIA: 6				
1006DS	BERLIN-LA CRUZ-LINARES-SN.MARC	N	35000	MM
1039DS	CA:2-COL.14 DE JULIO-CTON.SAN	N	4000	MM
1007DS	CA:2-TRES CALLES	N	2700	MM
1036DS	USULUTAN-LA PENA-LA HULERA	N	9000	MM
1009DS	SANTIAGO DE MARIA-EL AMATON-JU	N	12000	MM
1026DS	R(BERLIN-SN.JUAN LOMA ALTA)-LA	N	2400	MM
1027DS	ALEGRIA-PIEDRA HONDA	N	2000	M
1005DS	CA:1-MECHOTIQUE-LA CRUZ-BERLIN	N	22000	M
1003DS	SAN AGUSTIN-EL JICARO	N	6700	M
1008DS	ALEGRIA-LA PENA-PIEDRA HONDA	N	3400	M
1017DS	CA:1-JOCOTILLO-GUAYABITO	N	9800	M
1040DS	CA:2-EL TABURETE JAGUAL-LAS MI	N	6700	M
1047DS	SANTA MARIA-SANTA ELENA	N	2900	M
1012DS	SAN FCO.JAVIER-SAN LORENZO-BER	N	12000	M
1024DS	BERLIN-SAN JUAN LOMA ALTA	N	11000	M
1043DS	USULUTAN-UJUSHTE-CERRO EL NANZ	N	4700	M
1044DS	JUCUAP.-L.LA CRUZ-LL.EL CHILAM	N	5600	M
1029DS	SANTIAGO DE MARIA-CANTON BATRE	N	7200	R
1011DS	R(SN.FCO.JAV.-BERL.)-LOS AREN.	N	9700	R
1383DS	CA:2-CANTON HULE CHACHO	N	5000	R
1020DS	JIQUILISCO-PUERTO AVALOS	N	4500	R
1031DS	SANTA ELENA-NISPERAL-EL VOLCAN	N	4500	R
1021DS	CA:2-CTON.PALO GALAN-OBRAJUELO	N	8100	R

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