REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS & HIGHWAYS

Feasibility Study
on
The Rural Road Network Development Project

FINAL REPORT (Volume 3)

APPENDIX

OCTOBER, 1990

JAPAN INTERNATIONAL COOPERATION AGENCY

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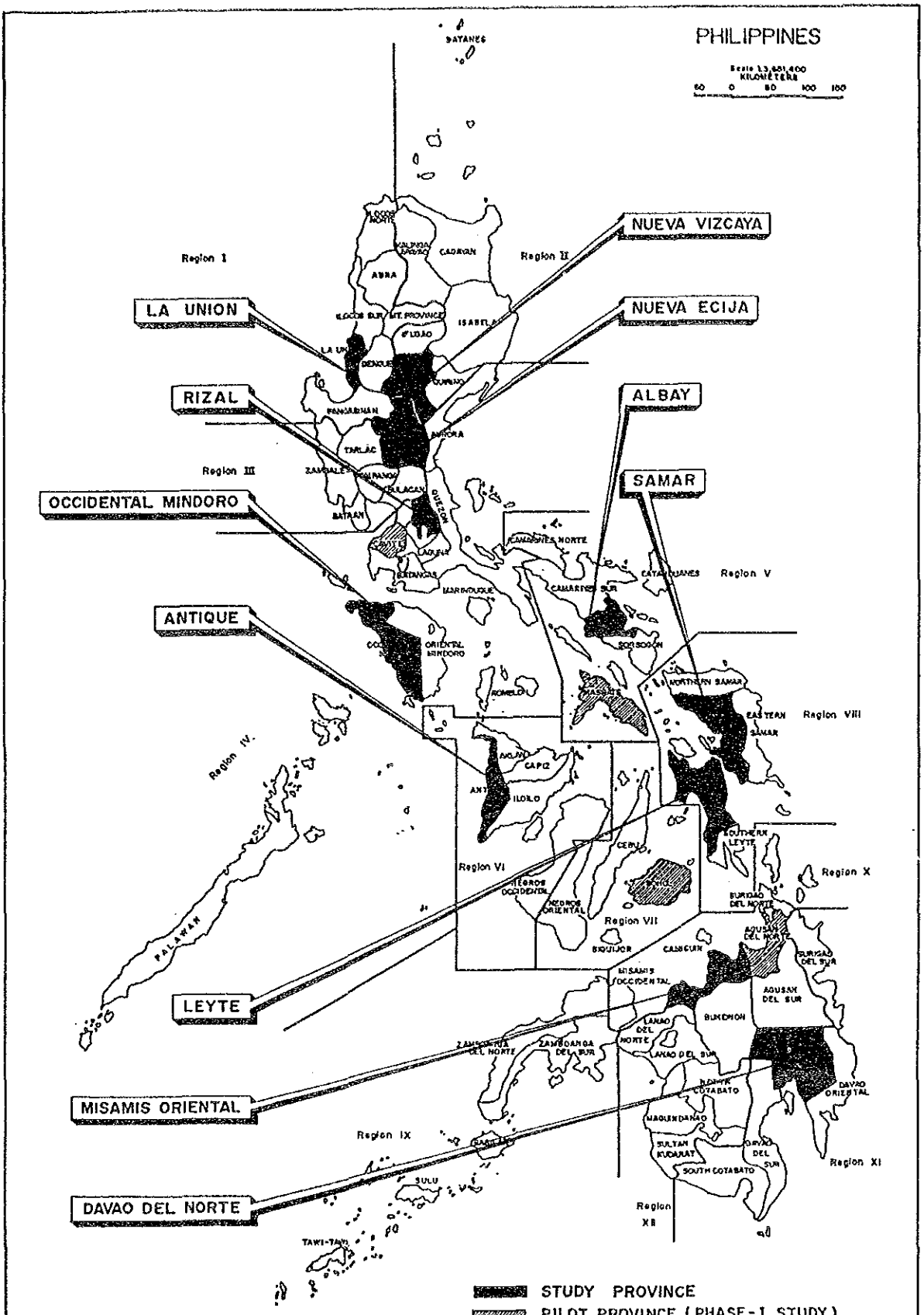


FEASIBILITY STUDY
ON
THE RURAL ROAD NETWORK DEVELOPMENT PROJECT

LOCATION MAP

APPENDIX

Appendix 2–1

BASIC DATA

Basic Data by Province (1)

	Land Area (km2)		Distance to KM/Cebu/ Davao(km)	Population			
	Total Area	Arable Area		1980 Total	1987 Total	1987 Urban	1987 Rural
All Philippines	299,970.4	133,258.0	240	48,317,443	57,294,264	23,502,052	33,792,212
NCR	636.0	196.4	20	5,970,310	7,337,852	7,337,852	0
Region I	21,568.5	9,217.3	270	3,542,778	4,053,759	1,113,844	2,939,915
Abra	3,975.6	939.3	330	160,094	183,682	31,078	152,604
Benguet	2,655.4	446.2	210	357,313	430,656	158,002	272,654
Ilocos Norte	3,399.3	1,448.7	400	389,428	440,000	125,679	314,321
Ilocos Sur	2,579.6	1,205.0	280	442,250	508,367	94,499	413,868
La Union	1,493.1	955.3	230	453,031	531,746	102,279	429,467
Mountain Province	2,097.3	209.1	280	103,162	112,756	4,875	107,881
Pangasinan	5,368.2	4,013.7	180	1,637,510	1,846,552	597,432	1,249,120
Region II	36,403.1	10,232.6	340	2,227,288	2,645,709	481,554	2,164,155
Batanes	209.3	55.8	750	12,032	13,398	3,702	9,696
Cagayan	9,002.7	3,347.9	380	713,485	829,016	133,746	695,271
Ifugao	2,517.8	252.0	250	111,575	127,767	13,372	114,395
Isabela	10,664.6	4,554.0	280	877,178	1,051,442	208,968	842,474
Kalinga-Apayao	7,047.6	728.1	350	186,054	221,641	29,934	191,707
Nueva Vizcaya	3,903.9	916.8	200	242,946	294,946	67,537	227,409
Quirino	3,057.2	378.0	200	84,018	107,499	24,296	83,203
Region III	18,230.8	10,235.8	80	4,826,671	5,720,409	2,798,515	2,921,894
Bataan	1,373.0	693.3	60	326,074	410,868	197,121	213,747
Bulacan	2,625.0	1,695.9	40	1,103,200	1,333,100	809,512	523,588
Nueva Ecija	5,284.3	3,308.6	110	1,074,028	1,245,132	364,586	880,546
Pampanga	2,180.7	1,603.4	60	1,187,772	1,414,294	929,854	484,440
Tarlac	3,053.4	1,816.1	110	690,268	784,751	151,821	632,930
Zambales	3,714.4	1,118.5	120	445,329	532,264	345,621	186,643
Region IV	46,924.2	19,717.0	210	6,154,795	7,478,584	3,070,315	4,408,269
Aurora	3,239.6	1,619.0	160	107,479	137,106	35,357	101,749
Batangas	3,165.8	2,096.6	70	1,166,869	1,370,236	258,649	1,111,587
Cavite	1,287.6	719.7	30	771,165	1,001,734	662,769	338,965
Laguna	1,759.7	1,091.0	60	974,989	1,212,877	823,245	389,632
Marinduque	959.2	737.2	260	172,805	198,993	29,870	169,123
Occidental Mindoro	5,879.9	1,539.8	290	223,155	268,900	44,671	224,229
Oriental Mindoro	4,364.7	2,222.8	290	454,652	545,684	78,635	467,049
Palawan	14,896.3	3,469.2	680	378,818	464,414	116,226	348,188
Quezon	8,706.6	4,199.2	130	1,145,188	1,345,895	405,081	940,814
Rizal	1,308.9	1,030.1	30	667,347	718,349	586,522	131,827
Romblon	1,355.9	992.4	360	192,350	214,396	29,290	185,106
Region V	17,632.5	12,086.9	350	3,489,379	4,101,883	1,020,134	3,081,749
Albay	2,552.6	2,060.8	320	812,265	944,345	236,349	707,996
Camarines Norte	2,112.5	1,318.5	200	309,208	370,093	116,078	254,015
Camarines Sur	5,266.8	3,614.7	270	1,102,723	1,308,146	344,612	963,533
Catanduanes	1,511.5	730.9	460	174,984	200,280	52,383	147,897
Masbate	4,047.7	2,630.7	480	587,551	685,013	121,036	563,977
Sorsogon	2,141.4	1,731.3	370	502,648	594,007	149,676	444,331
Region VI	20,223.2	13,673.0	270	4,537,783	5,316,864	1,637,421	3,679,443
Aklan	1,817.9	940.0	320	324,900	378,704	51,352	327,352
Antique	2,522.0	1,447.3	300	345,365	405,639	90,483	315,156
Capiz	2,633.2	1,630.6	270	493,959	585,416	88,753	496,663
Iloilo	5,324.0	3,827.1	250	1,435,434	1,658,966	501,400	1,157,566
Negros Occidental	7,926.1	5,828.0	200	1,938,125	2,288,139	905,433	1,382,706
Region VII	14,951.5	8,316.8	160	3,796,040	4,368,559	1,536,854	2,821,705
Bohol	4,117.3	3,095.5	160	804,828	899,457	146,068	753,389
Cebu	5,088.4	2,523.7	30	2,099,174	2,424,129	1,158,575	1,265,554
Negros Oriental	5,402.3	2,535.7	220	822,073	956,579	221,802	734,777
Siquijor	343.5	161.9	230	69,965	78,394	10,409	67,985
Region VIII	21,431.7	9,620.1	290	2,805,092	3,184,375	766,851	2,418,524
Leyte	6,268.3	4,012.5	220	1,305,291	1,478,114	398,900	1,079,214
Southern Leyte	1,734.8	1,204.8	230	296,440	351,038	59,361	291,677
Eastern Samar	4,339.6	1,365.5	320	321,445	374,026	103,553	270,473
Northern Samar	3,498.0	1,176.8	350	379,657	452,151	118,103	334,048
Samar	5,591.0	1,870.5	310	502,259	529,046	85,934	443,112
Region IX	18,685.1	8,688.1	490	2,546,823	2,991,332	568,928	2,422,404
Basilan	1,327.2	757.7	480	201,693	249,959	39,676	201,283
Sulu	1,600.4	970.5	600	363,648	420,605	78,073	342,532
Tawi-Tawi	1,087.4	377.4	750	194,514	227,997	26,065	201,932
Zamboanga del Norte	6,075.2	2,547.6	330	593,974	687,408	126,874	560,534
Zamboanga del Sur	8,594.9	4,034.9	290	1,192,994	1,414,363	298,240	1,116,123
Region X	28,327.8	10,383.6	210	2,773,427	3,346,530	1,075,993	2,270,537
Agusan del Norte	2,590.3	618.4	210	367,250	441,953	170,879	271,074
Agusan del Sur	8,965.5	2,183.0	140	265,802	329,240	65,660	263,580
Bukidnon	8,293.8	3,192.0	120	631,447	765,411	134,727	630,684
Camiguin	229.8	72.2	260	58,081	61,870	19,033	42,837
Misamis Occidental	1,939.3	1,240.4	250	389,491	451,089	81,329	369,760
Misamis Oriental	3,570.1	1,872.9	190	694,482	854,750	447,193	407,557
Surigao del Norte	2,739.0	1,204.7	300	366,874	442,217	157,172	286,045
Region XI	31,662.9	11,463.0	110	3,368,677	4,028,074	1,471,319	2,556,755
Davao del Norte	8,129.8	2,663.8	80	729,482	852,535	225,474	627,061
Davao del Sur	6,377.6	2,217.8	40	1,140,562	1,386,630	668,372	718,258
Davao Oriental	5,164.5	1,980.3	110	340,948	408,000	103,303	302,697
South Cotabato	7,468.8	3,291.9	110	775,262	925,118	329,548	595,570
Surigao del Sur	4,522.2	1,309.2	210	382,423	457,791	144,622	313,169
Region XII	23,293.1	9,427.4	130	2,278,380	2,730,334	623,472	2,106,862
Lanao del Norte	3,092.0	1,521.8	190	406,778	558,880	125,193	433,687
Lanao del Sur	3,872.9	1,197.6	150	396,974	464,917	87,466	377,451
Maguindanao	5,474.1	1,677.0	140	533,782	630,533	190,885	439,648
North Cotabato	6,565.9	2,817.4	60	573,249	693,098	120,567	572,531
Sultan Kudarat	4,288.2	2,213.8	130	307,597	382,906	99,361	283,545

ic Data by Province (2)

	GRDP (Mp)	Per Capita Income (p)	No. of Workers by Industrial Sector in 1980 Total	Primary	Secondary	Tertiary	Others	Un-employment Rate (%)	Under-employment Rate (%)
Philippines	623,051	5,593	14,197,122	7,303,325	2,176,741	4,532,122	164,934	8.3	11.6
	184,990	10,797	2,096,433	122,621	627,000	1,316,305	30,507	17.2	3.4
ion I	27,622	5,734	988,785	571,776	132,186	272,539	12,284	5.8	12.6
Abra	1,149	4,198	46,163	33,900	3,076	8,829	358	4.8	8.8
Benguet	3,621	9,218	114,712	49,100	28,297	37,095	220	2.7	3.3
Ilocos Norte	2,877	6,448	109,118	69,382	9,745	27,702	2,289	7.8	19.3
Ilocos Sur	3,362	4,175	127,387	83,002	13,950	28,699	1,736	6.4	10.3
La Union	3,458	6,461	122,237	67,894	15,892	36,573	1,878	9.0	11.4
Mountain Province	934	5,019	40,238	33,044	1,944	5,013	237	4.3	0.0
Pangasinan	12,224	5,182	428,930	235,454	69,282	128,628	5,566	7.4	15.7
ion II	15,772	5,030	642,475	469,314	41,333	123,359	8,469	5.2	6.4
Batanes	88	6,091	4,379	2,455	66	913	945	0.0	0.0
Cagayan	4,918	4,632	198,162	139,493	13,321	40,808	4,340	7.0	9.3
Ifugao	1,001	4,537	46,478	39,966	2,439	3,895	178	4.8	3.3
Isabela	5,137	4,693	242,666	172,990	17,513	50,421	1,742	2.9	3.4
Kalinga-Apayao	1,259	5,796	57,260	47,989	1,473	7,462	336	9.1	1.1
Nueva Vizcaya	1,800	6,274	89,113	47,005	5,226	16,206	676	6.6	16.8
Quirino	569	6,927	24,417	19,416	1,295	3,654	52	6.7	2.4
ion III	58,601	6,808	1,388,123	555,985	296,979	512,473	22,686	9.6	7.3
Bataan	4,650	6,396	101,623	34,571	32,018	34,159	875	17.4	0.8
Bulacan	16,497	7,361	356,425	104,833	112,394	135,919	3,279	10.7	8.7
Nueva Ecija	10,028	5,014	282,380	175,799	22,624	74,240	9,717	6.9	11.4
Pampanga	14,662	7,483	328,794	99,421	84,925	139,990	4,458	8.8	6.3
Tarlac	7,413	4,931	191,166	99,846	24,805	63,811	2,704	9.0	6.2
Zambales	5,349	10,982	127,735	41,515	20,213	44,354	1,653	8.8	3.5
ion IV	92,229	5,514	1,825,029	864,778	382,039	561,110	17,102	8.4	12.9
Aurora	1,189	3,134	30,072	21,652	1,504	5,766	150	5.5	2.0
Batangas	18,726	5,431	362,531	162,485	78,806	119,024	2,216	11.4	19.8
Cavite	14,514	7,157	252,059	78,138	74,862	97,043	2,016	5.8	0.3
Laguna	17,254	7,396	304,582	99,716	85,091	117,386	2,189	12.8	5.6
Marinduque	2,061	3,505	45,654	26,935	7,036	10,741	942	14.7	12.3
Occidental Mindoro	2,394	6,935	60,299	44,042	3,835	12,482	140	0.0	1.8
Oriental Mindoro	4,637	4,049	117,452	80,130	7,987	25,521	3,814	7.7	18.5
Palawan	4,129	3,901	105,260	78,723	7,103	18,819	615	2.0	9.0
Quezon	14,022	3,763	323,594	208,478	36,953	75,995	2,168	7.2	18.1
Rizal	10,875	6,974	171,348	33,254	69,865	65,562	2,667	7.3	8.2
Romblon	2,428	3,056	52,178	31,225	9,197	11,571	185	5.6	56.4
ion V	21,048	3,447	920,308	609,165	89,864	211,948	9,331	5.6	17.2
Albay	5,458	3,868	230,285	127,271	38,694	60,633	3,687	6.9	9.7
Camarines Norte	1,936	3,454	81,529	49,345	9,644	21,958	584	4.4	28.8
Camarines Sur	5,520	3,604	283,934	191,181	22,639	67,700	2,414	6.0	21.9
Catanduanes	1,016	3,449	44,386	30,475	2,588	10,816	507	3.7	13.8
Masbate	3,207	3,018	149,941	119,434	6,318	23,588	601	3.5	9.2
Sorsogon	2,911	2,918	130,233	91,459	9,981	27,253	1,538	8.5	20.0
gion VI	44,997	4,294	1,320,035	798,495	126,948	377,511	17,081	7.3	19.8
Aklan	3,415	5,133	96,444	58,312	11,804	25,011	1,317	5.2	14.2
Antique	3,216	3,255	98,319	66,513	9,763	20,761	1,282	11.0	13.2
Capiz	4,555	3,802	141,679	95,249	11,144	34,804	482	6.6	12.0
Iloilo	14,041	4,765	412,539	241,653	37,941	125,234	7,711	6.4	31.0
Negros Occidental	19,770	4,122	571,054	336,768	56,296	171,701	6,289	8.1	14.7
gion VII	42,139	3,878	1,236,141	703,161	190,550	334,137	8,293	5.7	7.5
Bohol	7,495	3,151	244,970	155,829	36,154	50,251	2,736	3.5	1.2
Cebu	27,432	4,125	707,639	338,908	135,906	230,693	2,130	6.3	5.1
Negros Oriental	6,649	3,968	252,012	192,743	17,388	48,550	3,331	6.2	18.3
Siquijor	563	3,572	21,520	15,581	1,100	4,643	96	0.0	7.9
gion VIII	14,336	3,281	788,603	563,565	54,065	161,933	9,040	6.0	16.6
Leyte	7,007	3,456	373,727	254,262	30,073	84,817	4,575	5.5	17.3
Southern Leyte	1,478	3,363	81,904	59,549	4,574	16,957	824	10.3	12.2
Eastern Samar	1,544	3,236	86,668	65,086	4,582	16,675	325	10.9	15.1
Northern Samar	1,715	2,372	98,388	73,921	4,438	18,429	1,600	2.3	11.5
Samar	2,592	3,532	147,916	110,747	10,398	25,055	1,716	5.3	22.9
gion IX	21,532	4,110	681,943	498,195	38,374	137,307	8,067	5.2	4.6
Basilan	1,621	2,935	52,136	39,587	2,467	9,505	577	4.3	0.0
Sulu	3,023	3,836	99,248	76,461	7,719	14,486	600	4.3	0.0
Tawi-Tawi	1,283	4,681	42,757	35,175	1,520	5,785	277	2.3	11.6
Zamboanga del Norte	4,961	3,605	160,746	124,172	6,628	28,107	1,839	4.0	4.6
Zamboanga del Sur	10,644	4,547	327,058	222,800	20,040	79,444	4,774	6.7	5.2
gion X	31,859	4,873	762,706	495,961	65,785	190,309	10,651	7.6	12.3
Agusan del Norte	4,909	4,347	98,897	52,034	15,395	29,878	1,590	11.7	13.3
Agusan del Sur	2,306	4,191	69,133	55,869	2,401	10,154	709	4.8	3.6
Bukidnon	5,789	5,653	170,671	136,724	6,414	26,159	1,374	9.1	20.9
Camiguin	644	2,742	16,293	11,004	857	4,254	178	4.3	4.5
Misamis Occidental	4,776	2,909	112,274	70,343	8,702	31,912	1,317	5.3	12.5
Misamis Oriental	9,621	6,335	198,408	101,314	24,523	68,019	4,552	8.2	10.5
Surigao del Norte	3,814	4,083	97,030	68,673	7,493	19,933	931	4.3	6.3
gion XI	45,009	5,190	948,917	627,225	83,978	231,525	6,189	8.1	13.3
Davao del Norte	8,862	4,956	209,409	161,937	11,346	35,209	917	2.4	10.0
Davao del Sur	18,084	5,933	333,885	178,040	44,110	112,653	1,082	11.1	6.7
Davao Oriental	3,654	4,083	89,509	70,193	3,376	14,513	1,427	2.4	11.6
South Cotabato	9,660	5,429	212,661	149,317	14,456	47,497	1,391	10.8	23.1
Surigao del Sur	4,740	3,882	101,453	67,738	10,690	21,653	1,372	9.6	13.5
gion XII	22,926	4,089	597,624	423,084	47,640	121,666	5,234	4.7	20.4
Lanao del Norte	5,490	3,968	130,500	74,428	17,059	35,938	3,075	9.1	27.8
Lanao del Sur	4,166	5,155	97,746	60,709	14,043	22,356	638	3.5	1.5
Maguindanao	5,205	3,603	139,261	103,113	8,885	26,698	565	3.8	4.9
North Cotabato	5,329	3,603	152,175	121,300	4,762	25,359	754	3.8	43.0
Sultan Kudarat	2,736	4,645	77,942	63,534	2,891	11,313	202	2.0	2.7

Basic Data by Province (3)

	Agricultural Area (ha)			Crop Area				Production			
	Total Area	Farm Area	Unutilized Area	Palay (ha)	Corn (ha)	SugarCane (ha)	Coconut (1000tree)	Palay (t)	Corn (t)	SugarCane (kg)	Coconut (1000nut)
All Philippines	14,789,200	9,011,200	5,778,000	3,649,882	2,466,885	298,825	317,138.0	7,883,691	2,839,444	14,352,270	10,249,151
NCR	48,100	48,100	0	36,356	5,336	1,341	1,113.7	96,860	10,483	65,326	37,427
Region I	944,800	373,500	571,300	332,624	37,743	2,967	526.6	665,539	41,227	76,965	9,014
Abra	96,300	24,000	72,300	18,933	4,561	148	12.9	30,565	7,517	208	140
Benguet	45,800	42,600	3,200	7,203	582	0	1.4	11,805	582	1	171
Ilocos Norte	148,600	40,500	108,100	37,232	3,901	752	44.8	107,128	4,078	14,253	697
Ilocos Sur	123,600	43,400	80,200	35,587	4,806	231	23.6	69,371	3,479	614	310
La Union	98,000	41,100	56,900	35,873	1,650	215	59.4	89,750	1,465	907	1,122
Mountain Province	21,500	19,200	2,300	7,177	1,593	113	6.0	14,469	1,932	450	72
Pangasinan	411,000	162,700	248,300	190,619	20,650	1,508	378.6	342,453	22,174	60,832	6,502
Region II	2,021,400	568,200	1,453,200	392,556	134,070	2,550	786.9	857,125	144,759	36,350	18,357
Batanes	11,000	4,500	6,500	182	241	33	43.7	384	463	292	397
Cagayan	661,400	147,500	513,900	124,793	42,107	1,921	411.5	236,194	45,315	29,208	9,634
Ifugao	49,800	33,500	16,300	12,649	5,188	1	4.2	19,665	6,102	2	117
Isabela	899,600	222,300	677,300	162,883	65,957	443	161.9	384,840	65,344	5,540	5,271
Kalinga-Apayao	143,800	78,600	65,200	40,756	5,630	76	122.9	92,375	9,512	422	2,305
Nueva Vizcaya	181,100	56,800	124,300	40,880	7,857	37	33.3	104,445	9,123	32	494
Quirino	74,700	25,000	49,700	10,413	7,090	39	9.4	19,242	8,900	854	139
Region III	1,087,800	468,500	619,300	563,284	9,723	24,495	133.8	1,464,167	14,156	210,300	2,300
Bataan	73,700	20,700	53,000	22,328	267	388	58.5	59,259	344	1,808	606
Bulacan	180,200	66,700	113,500	103,008	950	111	12.6	249,745	1,382	3,280	493
Nueva Ecija	351,800	183,700	167,900	246,330	4,817	189	16.0	709,502	5,706	2,226	399
Pampanga	170,400	71,700	98,700	70,125	1,655	14,782	10.9	188,874	4,019	112,941	173
Tarlac	193,000	97,100	95,900	95,705	1,852	8,819	7.5	214,231	2,549	88,419	268
Zambales	118,900	28,600	90,300	22,289	182	205	28.3	42,556	156	1,626	303
Region IV	2,001,300	1,126,300	875,000	406,057	90,084	37,092	70,813.9	786,262	90,672	892,573	1,733,977
Aurora	164,300	27,600	136,700	16,845	481	3	866.2	30,132	350	2	16,681
Batangas	212,300	127,300	85,000	48,866	24,930	27,758	3,545.5	89,600	21,034	539,265	117,886
Cavite	73,100	47,800	25,300	27,475	3,741	1,146	1,048.0	77,573	7,113	67,179	37,949
Laguna	110,700	67,400	43,300	36,763	838	8,105	8,691.1	114,833	1,266	285,823	215,048
Marinduque	74,800	33,800	41,000	10,536	1,262	1	3,581.3	11,359	779	0	87,304
Occidental Mindoro	156,300	94,000	62,300	45,904	7,456	4	187.7	110,402	7,292	2	2,908
Oriental Mindoro	225,600	128,500	97,100	77,514	9,058	26	4,262.9	144,830	8,990	6	133,688
Palawan	352,200	203,400	148,800	51,493	11,904	40	2,910.7	78,181	12,478	176	103,620
Quezon	426,200	320,000	106,200	66,816	24,724	2	43,640.8	107,137	25,456	3	949,761
Rizal	104,600	28,000	76,600	11,530	3,011	6	89.5	23,532	4,329	111	950
Romblon	100,700	48,500	52,200	12,524	2,679	1	3,990.2	18,683	1,585	6	68,184
Region V	983,700	945,600	38,100	266,082	113,808	5,974	52,897.6	518,847	84,487	280,712	1,520,585
Albay	150,700	145,100	5,600	51,858	17,001	1,360	8,272.6	104,233	15,186	60,942	309,781
Camarines Norte	108,300	106,500	1,800	15,964	751	110	9,782.3	40,700	625	3,094	186,440
Camarines Sur	271,200	260,900	10,300	117,439	23,056	4,365	13,002.1	250,385	21,665	214,890	332,148
Catanduanes	47,500	40,600	6,900	12,344	2,137	87	958.5	17,708	1,901	1,336	17,564
Masbate	258,100	249,200	8,900	34,993	68,617	37	11,484.1	29,512	43,014	79	364,993
Sorsogon	137,900	133,300	4,600	33,484	2,206	15	9,399.8	76,309	2,096	371	309,659
Region VI	1,072,200	745,800	326,400	473,793	95,246	148,066	9,754.2	982,774	65,136	9,817,868	253,282
Aklan	73,700	44,500	29,200	38,599	2,299	5	3,560.1	72,727	1,870	1	115,775
Antique	113,500	68,100	45,400	58,513	7,945	1,458	821.2	100,427	2,466	38,701	18,579
Capiz	127,900	86,900	41,000	93,269	7,903	8,717	985.6	235,846	6,768	478,033	29,943
Iloilo	300,100	246,200	53,900	206,822	26,066	19,706	1,437.5	408,837	13,753	587,987	19,120
Negros Occidental	457,000	300,100	156,900	76,590	51,033	118,180	2,949.8	164,935	40,279	8,713,144	69,865
Region VII	730,200	529,700	200,500	120,327	369,554	43,348	18,101.0	182,477	333,000	1,308,304	473,570
Bohol	271,800	138,300	133,500	89,981	26,027	91	4,257.2	122,375	18,436	819	123,687
Cebu	221,600	163,300	58,300	7,196	198,742	5,465	8,601.1	10,086	183,787	259,355	192,389
Negros Oriental	222,600	220,500	2,100	22,349	137,506	37,792	4,903.8	49,426	126,359	1,048,120	152,354
Siquijor	14,200	7,600	6,600	801	7,279	0	338.9	589	4,438	0	5,130
Region VIII	921,200	645,700	275,500	210,128	64,419	10,102	44,078.6	378,527	63,638	547,016	1,342,893
Leyte	347,200	274,000	73,200	115,281	48,386	10,016	15,090.1	216,531	41,381	546,530	391,422
Southern Leyte	110,400	64,500	45,900	12,123	1,156	16	5,107.8	36,405	1,590	11	203,166
Eastern Samar	132,800	78,400	54,400	16,843	100	26	6,036.9	24,427	57	111	232,844
Northern Samar	154,700	129,200	25,500	32,083	1,135	19	10,409.5	44,777	1,624	343	285,765
Samar	176,100	99,600	76,500	33,798	13,642	25	7,434.3	56,487	18,986	21	229,696
Region IX	1,040,800	769,800	271,000	128,930	234,592	710	34,176.9	246,432	199,897	1,405	1,315,635
Basilan	90,800	66,300	24,500	2,273	798	16	5,073.2	4,005	1,248	94	237,710
Sulu	116,300	98,800	17,500	11,198	3,175	191	8,774.2	8,057	1,641	903	221,866
Tawi-Tawi	45,200	38,500	6,700	1,840	623	84	1,412.1	3,190	1,592	218	65,635
Zamboanga del Norte	305,200	225,900	79,300	25,826	72,565	105	9,549.7	38,064	66,066	102	420,270
Zamboanga del Sur	483,300	340,300	143,000	87,793	157,431	314	11,367.7	193,116	129,350	88	370,155
Region X	1,296,100	892,200	403,800	159,618	414,081	9,587	25,244.1	291,108	468,396	570,739	970,795
Agusan del Norte	125,200	87,100	38,100	18,606	18,998	18	2,531.5	34,913	16,582	16	89,082
Agusan del Sur	232,500	126,100	106,400	44,083	57,772	39	871.8	68,702	67,613	85	21,604
Bukidnon	393,400	331,300	62,100	56,112	244,943	9,365	650.9	103,411	314,470	568,110	13,966
Camiguin	17,000	10,700	6,300	1,070	317	0	1,181.9	2,066	304	0	31,235
Misamis Occidental	151,800	86,200	65,600	12,830	18,338	14	5,341.0	34,899	14,204	156	191,123
Misamis Oriental	228,800	156,500	72,300	5,868	71,720	111	5,815.3	8,580	52,539	2,351	312,304
Surigao del Norte	147,400	94,400	53,000	21,049	1,993	40	6,851.7	38,538	2,484	21	311,481
Region XI	1,263,100	1,086,300	176,800	212,428	497,519	6,848	44,567.6	636,291	673,320	327,510	1,914,092
Davao del Norte	283,500	262,900	20,600	65,383	95,156	40	6,241.4	184,675	115,188	696	335,418
Davao del Sur	319,400	287,600	31,800	40,398	138,238	6,663	19,341.6	151,807	203,397	323,243	728,120
Davao Oriental	198,200	155,400	42,800	9,668	42,546	8	9,108.5	22,812	39,524	11	403,329
South Cotabato	322,700	248,800	73,900	68,388	207,125	99	4,706.5	225,569	300,319	3,543	307,410
Surigao del Sur	139,300	131,600	7,700	28,589	14,454	38	5,172.6	52,028	14,892	17	139,815
Region XII	1,378,500	811,400	567,100	347,691	400,710	5,745	14,940.1	777,182	650,273	217,204	657,223
Lanao del Norte	222,500	138,500	84,000	28,367	73,202	29	6,353.9	49,855	88,731	49	294,608
Lanao del Sur	175,100	145,900	29,200	68,506	65,134	22	2,330.9	135,731	101,767	8	114,099
Maguindanao	245,200	167,600	77,600	68,320	113,534	102	2,457.3	141,108	250,115	5,481	144,489
North Cotabato	412,000	244,300	167,700	111,738	103,730	5,202	2,015.2	253,986	129,123	197,188	67,673
Sultan Kudarat	323,700	115,100	208,600	70,760	45,080	390	1,782.8	196,452	80,537	14,478	36,354

Basic Data by Province (4)

	Number of Elementary Classrooms	Number of Hospital Beds	Incidence of Poverty (%)
All Philippines	254,585	86,904	59.3
NCR	9,582	27,356	44.1
Region I	24,917	6,201	52.3
Abra	1,369	447	66.6
Benguet	2,227	1,159	36.1
Ilocos Norte	2,327	1,266	54.6
Ilocos Sur	3,112	646	62.4
La Union	3,001	702	42.8
Mountain Province	1,072	296	57.1
Pangasinan	11,809	1,686	63.7
Region II	13,514	3,081	54.6
Batanes	204	100	74.2
Cagayan	4,256	1,024	55.0
Ifugao	984	211	66.3
Isabela	4,719	756	51.7
Kalinga-Apayao	1,162	499	60.5
Nueva Vizcaya	1,499	331	52.4
Quirino	690	160	53.7
Region III	25,621	5,741	44.4
Bataan	1,825	417	47.2
Bulacan	5,765	1,461	36.5
Nueva Ecija	5,340	993	55.1
Pampanga	6,235	1,517	36.5
Tarlac	4,237	740	56.2
Zambales	2,219	613	38.3
Region IV	33,046	7,447	55.9
Aurora	753	120	82.0
Batangas	7,172	1,445	52.4
Cavite	4,345	844	31.4
Laguna	4,405	1,425	38.8
Marinduque	1,521	150	82.5
Occidental Mindoro	1,373	260	51.6
Oriental Mindoro	2,404	295	70.5
Palawan	2,487	270	72.0
Quezon	4,936	1,578	72.5
Rizal	2,243	710	49.7
Romblon	1,407	250	83.0
Region V	22,063	4,950	73.2
Albay	4,436	1,455	66.8
Camarines Norte	1,690	422	69.6
Camarines Sur	7,297	1,607	71.5
Catanduanes	1,463	415	72.1
Masbate	3,549	527	78.9
Sorsogon	3,628	524	79.5
Region VI	28,592	4,695	73.1
Aklan	2,022	325	68.2
Antique	2,745	260	80.1
Capiz	3,707	480	74.0
Iloilo	8,100	1,915	69.4
Negros Occidental	12,018	1,715	75.1
Region VII	18,800	6,195	68.8
Bohol	5,099	1,200	74.8
Cebu	9,494	4,055	66.2
Negros Oriental	3,459	825	68.5
Siquijor	748	115	86.9
Region VIII	18,781	3,002	70.4
Leyte	8,312	1,504	68.0
Southern Leyte	2,386	428	69.9
Eastern Samar	2,321	414	76.6
Northern Samar	1,699	386	74.9
Samar	4,063	270	69.6
Region IX	12,310	3,093	65.3
Basilan	1,227	234	78.4
Sulu	1,292	480	63.0
Tawi-Tawi	685	122	66.0
Zamboanga del Norte	3,811	1,247	70.6
Zamboanga del Sur	5,295	1,010	60.9
Region X	16,868	5,032	66.2
Agusan del Norte	2,269	881	64.1
Agusan del Sur	1,693	301	68.7
Bukidnon	3,019	816	51.6
Camiguin	575	140	88.3
Misamis Occidental	2,979	1,312	78.4
Misamis Oriental	3,904	940	68.3
Surigao del Norte	2,429	642	71.6
Region XI	17,577	6,322	61.7
Davao del Norte	3,672	1,530	59.9
Davao del Sur	5,856	2,913	62.5
Davao Oriental	1,771	354	66.8
South Cotabato	3,853	874	57.1
Surigao del Sur	2,426	651	67.7
Region XII	12,914	3,789	65.2
Lanao del Norte	2,927	596	65.3
Lanao del Sur	3,662	305	56.0
Maguindanao	1,810	172	68.4
North Cotabato	2,028	1,738	74.3
Sultan Kudarat	2,487	978	54.8

Basic Data by Province (5)

	Length of National Road (km)					
	PCC	AC	Gravel	Earth	Total	L'
All Philippines	6,179.7	6,829.3	13,400.3	734.4	26,143.7	13,697.4
NCR	446.8	421.3	14.0	0.0	882.1	703.8
Region I	449.3	919.7	952.9	93.2	2,415.1	1,287.0
Abra	1.8	41.8	135.5	10.6	189.7	67.5
Benguet	45.2	184.8	219.0	31.4	480.4	221.8
Ilocos Norte	202.1	38.2	118.4	0.0	358.7	259.9
Ilocos Sur	35.7	137.5	162.9	34.0	370.1	167.1
La Union	49.9	131.9	34.2	0.0	216.0	139.3
Mountain Province	0.0	57.1	241.8	17.2	316.1	106.8
Pangasinan	114.6	328.4	43.1	0.0	486.1	324.6
Region II	599.1	108.8	1,532.0	61.9	2,301.8	1,124.0
Batanes	4.8	13.1	47.8	0.0	65.7	27.0
Cagayan	213.1	35.1	343.8	0.0	592.0	337.3
Ifugao	52.9	1.0	198.7	0.0	252.6	113.1
Isabela	192.8	47.6	181.1	0.0	421.5	275.7
Kalinga-Apayao	1.4	9.4	378.7	8.8	398.3	120.7
Nueva Vizcaya	120.5	2.2	137.4	53.1	313.2	163.0
Quirino	13.6	0.4	244.5	0.0	258.5	87.2
Region III	796.5	504.0	391.8	0.0	1,692.3	1,216.4
Bataan	140.8	121.4	33.7	0.0	295.9	223.8
Bulacan	161.7	71.4	24.6	0.0	257.7	211.9
Nueva Ecija	234.6	16.6	176.2	0.0	427.4	297.4
Pampanga	122.1	74.5	83.1	0.0	279.7	191.7
Tarlac	94.9	80.8	33.9	0.0	209.6	153.6
Zambales	42.4	139.3	40.3	0.0	222.0	138.1
Region IV	566.9	1,191.7	2,180.6	89.3	4,028.5	1,936.1
Aurora	0.4	21.4	196.6	0.0	218.4	72.2
Batangas	51.9	367.6	71.1	16.9	507.5	293.8
Cavite	48.7	239.4	13.9	0.0	302.0	196.5
Laguna	124.5	137.2	84.6	0.0	346.3	232.2
Marinduque	2.4	60.1	150.4	5.0	217.9	83.6
Occidental Mindoro	14.6	10.1	304.6	29.6	358.9	112.0
Oriental Mindoro	0.2	134.2	142.3	0.0	276.7	123.4
Palawan	5.5	9.3	536.6	0.0	551.4	172.1
Quezon	209.2	62.5	448.4	0.0	720.1	381.2
Rizal	109.4	99.6	35.2	0.0	244.2	179.7
Romblon	0.1	50.3	196.9	37.8	285.1	89.4
Region V	648.0	337.2	909.4	47.0	1,941.6	1,123.1
Albay	193.6	43.4	148.4	0.0	385.4	264.2
Camarines Norte	107.4	47.3	30.3	0.0	185.0	144.9
Camarines Sur	178.8	91.5	146.2	41.0	457.5	277.6
Catanduanes	22.6	11.9	217.9	0.0	252.4	95.1
Masbate	8.5	67.9	282.6	4.7	363.7	134.0
Sorsogon	137.1	75.2	84.0	1.3	297.6	207.4
Region VI	307.0	789.2	1,533.7	0.0	2,629.9	1,240.6
Aklan	22.5	54.7	64.4	0.0	141.6	74.6
Antique	23.9	49.4	289.5	0.0	362.8	140.4
Capiz	63.3	58.8	184.0	0.0	306.1	153.8
Iloilo	103.1	313.6	530.0	0.0	946.7	460.3
Negros Occidental	94.2	312.7	465.8	0.0	872.7	421.6
Region VII	164.6	676.5	821.2	4.4	1,666.7	816.9
Bohol	29.3	192.2	359.4	4.4	585.3	252.4
Cebu	78.5	301.6	243.3	0.0	623.4	332.5
Negros Oriental	56.8	155.9	169.7	0.0	382.4	201.3
Siquijor	0.0	26.8	48.8	0.0	75.6	30.7
Region VIII	662.0	57.1	1,152.4	92.1	1,963.6	1,042.0
Leyte	339.4	12.4	558.3	48.9	959.0	514.3
Southern Leyte	66.0	0.1	199.3	0.0	265.4	125.9
Eastern Samar	12.2	16.6	186.8	43.2	258.7	78.1
Northern Samar	102.0	0.0	146.2	0.0	248.2	145.9
Samar	142.4	28.1	61.8	0.0	232.3	177.8
Region IX	52.5	312.6	653.9	0.0	1,019.1	436.3
Basilan	0.0	48.1	14.0	0.0	62.1	33.1
Sulu	9.0	33.8	92.0	0.0	134.8	56.9
Tawi-Tawi	14.1	0.0	78.7	0.0	92.8	37.7
Zamboanga del Norte	8.7	49.7	201.7	0.0	260.1	99.0
Zamboanga del Sur	20.8	181.0	267.5	0.0	469.3	209.7
Region X	634.6	352.8	1,200.0	0.0	2,187.4	1,206.3
Agusan del Norte	125.0	0.9	89.2	0.0	215.1	152.3
Agusan del Sur	178.1	0.4	121.6	0.0	300.1	214.8
Bukidnon	7.4	98.8	507.1	0.0	613.3	218.8
Camiguin	1.7	35.6	26.2	0.0	63.5	30.9
Misamis Occidental	0.7	127.6	71.1	0.0	199.4	98.6
Misamis Oriental	238.8	87.9	126.5	0.0	453.2	329.5
Surigao del Norte	82.9	1.6	258.3	0.0	342.8	161.4
Region XI	455.2	129.9	1,224.4	144.7	1,954.2	900.5
Davao del Norte	175.7	2.1	173.7	0.0	351.5	229.1
Davao del Sur	118.3	95.1	179.8	120.0	513.2	229.3
Davao Oriental	11.1	7.2	290.0	0.0	308.3	102.4
South Cotabato	128.1	25.5	286.6	24.7	464.8	229.4
Surigao del Sur	22.0	0.0	294.4	0.0	316.4	110.3
Region XII	397.1	28.5	834.0	201.8	1,461.4	664.4
Lanao del Norte	93.2	0.8	130.5	0.0	224.5	132.8
Lanao del Sur	39.3	4.7	237.6	0.0	281.6	113.4
Maguindanao	113.0	3.2	129.0	3.2	248.4	153.6
North Cotabato	105.3	19.8	243.8	186.1	555.0	190.3
Sultan Kudarat	46.3	0.0	93.1	12.5	151.9	74.2

Basic Data by Province (6)

	Length of Provincial Road (km)					
	PCC	AC	Gravel	Earth	Total	L'
All Philippines	714.1	2,584.4	20,477.9	5,215.0	28,991.4	8,408.1
NCR	0.0	0.0	0.0	0.0	0.0	0.0
Region I	49.0	470.4	1,677.9	659.8	2,857.1	834.6
Abra	0.5	54.8	208.2	216.4	479.9	95.8
Benguet	2.0	38.3	155.2	125.6	321.1	71.5
Ilocos Norte	15.0	23.5	236.8	146.9	422.2	100.1
Ilocos Sur	0.6	43.3	135.1	84.1	263.1	67.1
La Union	22.8	57.3	189.7	2.1	251.9	108.1
Mountain Province	0.3	4.8	190.9	76.9	272.9	60.5
Pangasinan	7.8	248.4	582.0	7.8	846.0	331.4
Region II	8.5	159.0	1,416.8	388.2	1,972.5	528.9
Batanes	1.6	0.9	18.0	44.1	64.6	7.5
Cagayan	0.0	108.8	401.4	16.8	527.0	185.7
Ifugao	0.0	0.5	28.5	125.5	154.5	8.9
Isabela	2.4	32.2	545.7	0.0	580.3	185.4
Kalinga-Apayao	3.2	9.8	84.5	76.3	173.8	34.4
Nueva Vizcaya	1.3	6.8	241.1	120.5	369.7	77.7
Quirino	0.0	0.0	97.6	5.0	102.6	29.3
Region III	302.0	332.4	1,543.9	185.7	2,364.0	964.6
Bataan	11.8	53.6	159.5	0.3	225.2	91.8
Bulacan	122.0	92.3	137.9	0.0	352.2	218.8
Nueva Ecija	34.8	1.9	660.9	0.0	697.6	234.2
Pampanga	112.8	18.8	77.2	112.8	321.6	147.2
Tarlac	14.4	123.1	342.2	72.6	552.3	190.9
Zambales	6.2	42.7	166.2	0.0	215.1	81.7
Region IV	151.6	488.8	2,824.5	401.7	3,866.6	1,292.2
Aurora	0.0	4.1	111.8	0.0	115.9	36.0
Batangas	10.6	242.3	380.2	3.9	637.0	270.0
Cavite	45.3	91.5	203.0	89.7	429.5	161.1
Laguna	64.9	80.0	79.6	27.7	252.2	135.8
Marinduque	2.8	23.1	131.5	16.0	173.4	56.1
Occidental Mindoro	2.1	0.5	280.2	39.0	321.8	86.5
Oriental Mindoro	0.7	8.8	725.2	0.0	734.7	223.5
Palawan	0.0	5.8	449.5	48.9	504.2	138.3
Quezon	12.0	15.1	269.5	71.8	368.4	101.9
Rizal	7.3	15.7	13.5	30.3	66.8	20.8
Romblon	5.9	1.9	180.5	74.4	262.7	61.2
Region V	35.1	318.2	1,082.3	361.0	1,796.6	550.7
Albay	2.5	110.4	185.3	76.5	374.7	124.3
Camarines Norte	1.5	67.0	61.5	4.8	134.8	60.2
Camarines Sur	23.7	93.6	494.0	84.0	695.3	228.1
Catanduanes	5.1	8.9	131.2	78.4	223.6	49.8
Masbate	2.3	4.6	69.9	41.0	117.8	26.0
Sorsogon	0.0	33.7	140.4	76.3	250.4	62.3
Region VI	62.0	94.2	2,190.7	106.2	2,453.1	775.7
Aklan	8.3	3.3	274.5	0.0	286.1	92.6
Antique	1.2	2.9	92.6	0.0	96.7	30.7
Capiz	13.6	2.2	250.0	99.7	365.5	89.9
Iloilo	19.1	12.3	776.9	6.5	814.8	259.6
Negros Occidental	19.8	73.5	796.7	0.0	890.0	302.9
Region VII	13.7	170.0	1,918.6	261.5	2,363.8	691.3
Bohol	7.1	11.3	782.9	120.9	922.2	248.8
Cebu	6.6	109.7	718.5	95.3	930.1	288.0
Negros Oriental	0.0	39.7	241.6	45.3	326.6	96.3
Siquijor	0.0	9.3	175.6	0.0	184.9	58.3
Region VIII	60.6	327.4	830.6	185.2	1,403.8	506.2
Leyte	37.8	0.0	468.3	24.5	520.6	175.3
Southern Leyte	7.0	306.3	0.0	37.5	350.8	190.8
Eastern Samar	0.4	19.9	167.7	62.5	250.5	62.7
Northern Samar	7.2	0.0	78.9	60.7	146.8	30.9
Samar	8.2	1.2	125.7	0.0	135.1	46.6
Region IX	1.7	130.7	1,730.7	231.9	2,095.0	599.3
Basilan	0.0	2.9	119.9	106.4	229.2	37.7
Sulu	0.8	50.8	165.7	0.0	217.3	81.0
Tawi-Tawi	0.9	0.0	12.2	16.9	30.0	4.6
Zamboanga del Norte	0.0	21.2	786.6	0.0	807.8	248.7
Zamboanga del Sur	0.0	55.8	646.3	108.6	810.7	227.4
Region X	14.1	88.1	2,022.1	663.3	2,787.6	673.6
Agusan del Norte	3.3	0.2	221.6	7.8	232.9	69.9
Agusan del Sur	0.2	0.0	174.7	92.0	266.9	52.6
Bukidnon	0.0	42.1	655.0	90.0	787.1	221.8
Camiguin	0.3	15.2	39.4	39.6	94.5	21.2
Misamis Occidental	3.8	6.3	384.1	149.7	543.9	122.8
Misamis Oriental	4.5	23.3	285.9	187.8	501.5	104.3
Surigao del Norte	2.0	1.0	261.4	96.4	360.8	81.0
Region XI	10.7	4.5	2,210.5	783.7	3,009.4	676.6
Davao del Norte	0.0	2.4	730.6	10.7	743.7	220.6
Davao del Sur	0.0	0.9	375.0	49.8	425.7	113.0
Davao Oriental	1.0	1.2	420.2	126.5	548.9	127.8
South Cotabato	1.4	0.0	415.8	595.3	1,012.5	126.1
Surigao del Sur	8.3	0.0	268.9	1.4	278.6	89.0
Region XII	5.1	0.7	1,029.3	986.8	2,021.9	314.3
Lanao del Norte	1.3	0.0	200.0	0.0	201.3	61.3
Lanao del Sur	3.8	0.4	160.8	251.6	416.6	52.3
Maguindanao	0.0	0.0	55.4	286.5	341.9	16.6
North Cotabato	0.0	0.3	277.9	169.6	447.8	83.6
Sultan Kudarat	0.0	0.0	335.2	279.1	614.3	100.6

Basic Data by Province (7)

	Length of City Road (km)					
	PCC	AC	Gravel	Earth	Total	L'
All Philippines	649.4	2,008.0	1,164.5	164.7	3,984.6	2,202.4
NCR	281.9	832.8	159.1	0.0	1,273.8	829.3
Region I	8.3	183.4	118.1	0.0	309.8	153.8
Abra	0.0	0.0	0.0	0.0	0.0	0.0
Benguet	0.2	141.9	0.0	0.0	142.1	85.3
Ilocos Norte	6.9	18.8	105.2	0.0	130.9	49.7
Ilocos Sur	0.0	0.0	0.0	0.0	0.0	0.0
La Union	0.0	0.0	0.0	0.0	0.0	0.0
Mountain Province	0.0	0.0	0.0	0.0	0.0	0.0
Pangasinan	1.2	22.7	12.9	0.0	36.8	18.7
Region II	0.0	0.0	0.0	0.0	0.0	0.0
Batanes	0.0	0.0	0.0	0.0	0.0	0.0
Cagayan	0.0	0.0	0.0	0.0	0.0	0.0
Ifugao	0.0	0.0	0.0	0.0	0.0	0.0
Isabela	0.0	0.0	0.0	0.0	0.0	0.0
Kalinga-Apayao	0.0	0.0	0.0	0.0	0.0	0.0
Nueva Vizcaya	0.0	0.0	0.0	0.0	0.0	0.0
Quirino	0.0	0.0	0.0	0.0	0.0	0.0
Region III	56.5	115.9	41.0	45.2	258.6	138.3
Bataan	0.0	0.0	0.0	0.0	0.0	0.0
Bulacan	0.0	0.0	0.0	0.0	0.0	0.0
Nueva Ecija	5.5	15.3	18.8	0.0	39.6	20.3
Pampanga	51.0	30.3	2.0	45.2	128.5	69.8
Tarlac	0.0	0.0	0.0	0.0	0.0	0.0
Zambales	0.0	70.3	20.2	0.0	90.5	48.2
Region IV	37.9	127.7	102.1	25.0	292.7	145.2
Aurora	0.0	0.0	0.0	0.0	0.0	0.0
Batangas	4.6	29.0	1.7	2.0	37.3	22.5
Cavite	23.7	30.1	18.5	19.3	91.6	47.3
Laguna	6.1	49.5	24.2	0.0	79.8	43.1
Marinduque	0.0	0.0	0.0	0.0	0.0	0.0
Occidental Mindoro	0.0	0.0	0.0	0.0	0.0	0.0
Oriental Mindoro	0.0	0.0	0.0	0.0	0.0	0.0
Palawan	0.6	7.5	54.9	3.7	66.7	21.6
Quezon	2.9	11.6	2.8	0.0	17.3	10.7
Rizal	0.0	0.0	0.0	0.0	0.0	0.0
Romblon	0.0	0.0	0.0	0.0	0.0	0.0
Region V	20.3	81.1	125.8	18.1	245.3	106.7
Albay	2.1	17.3	3.5	4.0	26.9	13.5
Camarines Norte	0.0	0.0	0.0	0.0	0.0	0.0
Camarines Sur	18.2	63.8	122.3	14.1	218.4	93.2
Catanduanes	0.0	0.0	0.0	0.0	0.0	0.0
Masbate	0.0	0.0	0.0	0.0	0.0	0.0
Sorsogon	0.0	0.0	0.0	0.0	0.0	0.0
Region VI	91.7	152.4	48.8	4.6	297.5	197.8
Aklan	0.0	0.0	0.0	0.0	0.0	0.0
Antique	0.0	0.0	0.0	0.0	0.0	0.0
Capiz	13.3	2.6	12.1	0.0	28.0	18.5
Iloilo	27.2	2.7	1.9	0.0	31.8	29.4
Negros Occidental	51.2	147.1	34.8	4.6	237.7	149.9
Region VII	32.4	236.7	24.1	22.0	315.2	181.7
Bohol	0.0	65.4	0.0	0.0	65.4	39.2
Cebu	30.0	127.2	21.7	10.4	189.3	112.8
Negros Oriental	2.4	44.1	2.4	11.6	60.5	29.6
Siquijor	0.0	0.0	0.0	0.0	0.0	0.0
Region VIII	39.1	2.8	20.0	8.7	70.6	46.8
Leyte	30.9	2.8	18.1	8.7	60.5	38.0
Southern Leyte	0.0	0.0	0.0	0.0	0.0	0.0
Eastern Samar	0.0	0.0	0.0	0.0	0.0	0.0
Northern Samar	0.0	0.0	0.0	0.0	0.0	0.0
Samar	8.2	0.0	1.9	0.0	10.1	8.8
Region IX	8.2	76.9	36.3	0.1	121.5	65.2
Basilan	0.0	0.0	0.0	0.0	0.0	0.0
Sulu	0.0	0.0	0.0	0.0	0.0	0.0
Tawi-Tawi	0.0	0.0	0.0	0.0	0.0	0.0
Zamboanga del Norte	5.3	22.5	18.8	0.0	46.6	24.4
Zamboanga del Sur	2.9	54.4	17.5	0.1	74.9	40.8
Region X	36.2	71.2	99.0	11.0	217.4	108.6
Agusan del Norte	20.1	0.0	45.9	0.0	66.0	33.9
Agusan del Sur	0.0	0.0	0.0	0.0	0.0	0.0
Bukidnon	0.0	0.0	0.0	0.0	0.0	0.0
Camiguin	0.0	0.0	0.0	0.0	0.0	0.0
Misamis Occidental	1.4	29.0	35.4	5.6	71.4	29.4
Misamis Oriental	5.2	42.2	10.7	5.4	63.5	33.7
Surigao del Norte	9.5	0.0	7.0	0.0	16.5	11.6
Region XI	15.2	92.5	319.1	26.9	453.7	166.4
Davao del Norte	0.0	0.0	0.0	0.0	0.0	0.0
Davao del Sur	3.8	88.7	148.5	26.9	267.9	101.6
Davao Oriental	0.0	0.0	0.0	0.0	0.0	0.0
South Cotabato	11.4	3.8	170.6	0.0	185.8	64.9
Surigao del Sur	0.0	0.0	0.0	0.0	0.0	0.0
Region XII	21.7	32.6	71.1	3.1	128.5	62.6
Lanao del Norte	6.7	19.8	41.4	0.0	67.9	31.0
Lanao del Sur	1.3	12.0	11.5	2.5	27.3	12.0
Maguindanao	13.7	0.8	18.2	0.6	33.3	19.6
North Cotabato	0.0	0.0	0.0	0.0	0.0	0.0
Sultan Kudarat	0.0	0.0	0.0	0.0	0.0	0.0

Basic Data by Province (8)

	Length of Municipal Road (km)					
	PCC	AC	Gravel	Earth	Total	L'
All Philippines	1,676.4	1,574.6	6,383.0	3,224.8	12,858.7	4,536.0
NCR	315.2	162.0	29.4	11.8	518.4	421.2
Region I	40.4	286.5	667.4	409.6	1,403.9	412.6
Abra	4.5	34.3	52.8	160.2	251.8	40.9
Benguet	0.0	1.0	5.6	28.9	35.5	2.3
Ilocos Norte	8.2	40.9	213.8	31.8	294.7	96.9
Ilocos Sur	6.8	56.7	103.9	78.2	245.4	71.8
La Union	4.4	26.9	51.1	39.1	121.5	36.9
Mountain Province	0.0	2.2	5.9	29.0	37.1	3.1
Pangasinan	16.7	124.5	234.3	42.4	417.9	161.7
Region II	21.0	56.4	827.9	236.3	1,141.6	303.2
Batanes	14.9	0.0	3.8	11.7	30.4	16.0
Cagayan	0.0	16.3	170.2	16.1	202.6	60.8
Ifugao	0.0	0.1	13.5	4.8	18.4	4.1
Isabela	4.8	33.1	341.9	50.6	430.4	127.2
Kalinga-Apayao	0.4	2.1	25.3	58.0	85.8	9.3
Nueva Vizcaya	0.9	4.5	189.1	91.2	285.7	60.3
Quirino	0.0	0.3	84.1	3.9	88.3	25.4
Region III	202.1	213.6	466.9	155.2	1,036.8	470.0
Bataan	1.4	45.1	3.8	2.2	52.5	29.6
Bulacan	128.3	37.2	53.6	15.9	245.0	169.7
Nueva Ecija	4.4	29.4	289.6	0.9	324.3	108.9
Pampanga	47.6	7.0	7.3	56.1	118.0	54.0
Tarlac	11.2	43.3	64.3	13.9	132.7	66.5
Zambales	9.2	51.6	37.3	66.2	164.3	51.4
Region IV	330.1	239.3	594.1	217.3	1,380.8	651.9
Aurora	1.4	6.3	27.9	19.5	55.1	13.6
Batangas	18.5	109.5	63.2	45.9	237.1	103.2
Cavite	42.2	5.4	14.0	6.3	67.9	49.6
Laguna	91.0	21.4	13.3	21.1	146.8	107.8
Marinduque	11.4	8.9	67.3	47.5	136.1	36.9
Occidental Mindoro	2.8	0.0	121.1	7.7	131.6	39.1
Oriental Mindoro	3.2	5.0	56.4	1.9	66.5	23.1
Palawan	0.0	4.1	71.3	33.6	109.0	23.9
Quezon	61.4	30.3	104.8	17.6	214.1	111.0
Rizal	65.5	44.2	28.1	5.6	143.4	100.8
Romblon	32.7	4.2	26.7	10.6	74.2	43.2
Region V	107.1	192.3	361.0	121.2	781.6	330.8
Albay	13.9	59.6	75.2	17.9	166.6	72.2
Camarines Norte	18.9	29.8	25.1	12.4	86.2	44.3
Camarines Sur	36.8	35.9	136.5	34.0	243.2	99.3
Catanduanes	8.5	7.7	44.4	11.1	71.7	26.4
Masbate	16.1	9.3	37.0	24.2	86.6	32.8
Sorsogon	12.9	50.0	42.8	21.6	127.3	55.7
Region VI	204.3	75.8	359.3	67.1	696.5	357.6
Aklan	28.2	2.2	40.3	9.6	80.3	41.6
Antique	36.2	5.5	47.1	8.3	97.1	53.6
Capiz	27.1	1.5	37.0	15.8	81.4	39.1
Iloilo	88.5	21.1	100.3	14.9	224.8	131.3
Negros Occidental	24.3	45.5	134.6	8.5	212.9	92.0
Region VII	97.6	144.6	457.6	229.4	929.2	321.6
Bohol	26.0	30.8	138.1	93.4	288.3	86.9
Cebu	71.2	37.5	220.5	74.1	403.3	159.9
Negros Oriental	0.4	69.0	86.9	60.8	217.1	67.9
Siquijor	0.0	7.3	12.1	1.1	20.5	8.0
Region VIII	246.9	18.2	310.8	138.0	713.9	351.1
Leyte	100.4	10.9	178.7	61.5	351.5	160.6
Southern Leyte	32.2	0.0	36.6	12.4	81.2	43.2
Eastern Samar	69.9	4.1	54.9	16.4	135.3	78.8
Northern Samar	32.8	0.0	12.4	44.2	89.4	36.5
Samar	21.6	3.2	28.2	3.5	56.5	32.0
Region IX	3.3	25.5	547.7	260.1	836.6	182.9
Basilan	0.0	5.6	37.9	4.4	47.9	14.7
Sulu	0.2	2.6	0.5	16.1	19.4	1.9
Tawi-Tawi	0.4	0.0	0.0	24.6	25.0	0.4
Zamboanga del Norte	0.7	15.9	208.1	120.2	344.9	72.7
Zamboanga del Sur	2.0	1.4	301.2	94.8	399.4	93.2
Region X	38.4	91.9	556.4	523.9	1,210.6	260.5
Agusan del Norte	12.9	0.0	72.1	6.3	91.3	34.5
Agusan del Sur	7.3	0.0	68.4	86.2	161.9	27.8
Bukidnon	2.1	7.8	115.7	275.3	400.9	41.5
Camiguin	0.9	15.8	7.3	4.0	28.0	12.6
Misamis Occidental	1.1	10.3	93.4	65.3	170.1	35.3
Misamis Oriental	0.7	53.2	66.1	39.9	158.9	52.2
Surigao del Norte	13.4	4.8	134.4	46.9	199.5	56.6
Region XI	39.5	33.5	758.7	429.5	1,261.2	287.2
Davao del Norte	0.3	11.5	235.8	57.5	305.1	77.9
Davao del Sur	3.4	5.9	191.6	56.9	257.8	64.4
Davao Oriental	2.5	1.2	62.5	7.6	73.8	22.0
South Cotabato	17.1	9.9	187.5	297.6	512.1	79.3
Surigao del Sur	16.2	5.0	81.3	9.9	112.4	43.6
Region XII	30.5	34.9	446.8	435.4	947.6	185.5
Lanao del Norte	0.5	13.5	161.5	54.2	229.7	57.1
Lanao del Sur	7.4	0.2	59.4	177.6	244.6	25.3
Maguindanao	0.0	0.0	73.1	35.5	108.6	21.9
North Cotabato	22.5	20.9	130.7	75.5	249.6	74.3
Sultan Kudarat	0.1	0.3	22.1	92.6	115.1	6.9

Basic Data by Province (9)

	Length of Barangay Road (km)					
	PCC	AC	Gravel	Earth	Total	L'
All Philippines	299.1	557.7	84,828.9	0.0	85,685.7	13,368.1
NCR	0.0	0.0	234.7	0.0	234.7	35.2
Region I	18.5	72.4	9,898.9	0.0	9,989.8	1,546.8
Abra	0.0	0.0	1,309.6	0.0	1,309.6	196.4
Benguet	0.8	40.2	750.2	0.0	791.2	137.5
Ilocos Norte	3.0	4.4	1,859.7	0.0	1,867.1	284.6
Ilocos Sur	8.2	1.3	1,924.0	0.0	1,933.5	297.6
La Union	6.5	6.3	626.1	0.0	638.9	104.2
Mountain Province	0.0	0.0	172.9	0.0	172.9	25.9
Pangasinan	0.0	20.2	3,256.4	0.0	3,276.6	500.6
Region II	1.2	0.0	7,453.1	0.0	7,454.3	1,119.2
Batanes	1.2	0.0	115.2	0.0	116.4	18.5
Cagayan	0.0	0.0	2,135.2	0.0	2,135.2	320.3
Ifugao	0.0	0.0	557.8	0.0	557.8	83.7
Isabela	0.0	0.0	2,318.9	0.0	2,318.9	347.8
Kalinga-Apayao	0.0	0.0	668.4	0.0	668.4	100.3
Nueva Vizcaya	0.0	0.0	1,434.4	0.0	1,434.4	215.2
Quirino	0.0	0.0	223.2	0.0	223.2	33.5
Region III	83.9	19.1	7,619.9	0.0	7,722.9	1,238.3
Bataan	1.2	5.0	495.0	0.0	501.2	78.6
Bulacan	82.7	14.1	1,592.9	0.0	1,689.7	330.1
Nueva Ecija	0.0	0.0	1,739.5	0.0	1,739.5	260.9
Pampanga	0.0	0.0	1,532.2	0.0	1,532.2	229.8
Tarlac	0.0	0.0	1,660.2	0.0	1,660.2	249.0
Zambales	0.0	0.0	600.1	0.0	600.1	90.0
Region IV	122.8	204.5	8,460.1	0.0	8,787.4	1,514.5
Aurora	0.0	0.0	241.3	0.0	241.3	36.2
Batangas	4.6	144.2	2,086.0	0.0	2,234.8	404.0
Cavite	15.3	5.9	696.1	0.0	717.3	123.3
Laguna	60.1	20.1	564.4	0.0	644.6	156.8
Marinduque	0.0	0.0	138.8	0.0	138.8	20.8
Occidental Mindoro	0.0	0.0	794.2	0.0	794.2	119.1
Oriental Mindoro	0.0	0.0	242.5	0.0	242.5	36.4
Palawan	0.0	0.0	1,386.6	0.0	1,386.6	208.0
Quezon	5.2	3.5	784.9	0.0	793.6	125.0
Rizal	37.6	30.8	714.4	0.0	782.8	163.2
Romblon	0.0	0.0	810.9	0.0	810.9	121.6
Region V	12.3	70.8	3,768.2	0.0	3,851.3	620.0
Albay	3.5	40.1	640.4	0.0	684.0	123.6
Camarines Norte	0.0	3.8	316.9	0.0	320.7	49.8
Camarines Sur	4.7	20.4	1,790.1	0.0	1,815.2	285.5
Catanduanes	0.8	0.0	239.5	0.0	240.3	36.7
Masbate	0.0	0.0	441.0	0.0	441.0	66.2
Sorsogon	3.3	6.5	340.3	0.0	350.1	58.2
Region VI	49.3	99.8	7,753.0	0.0	7,902.1	1,272.1
Aklan	0.0	0.0	623.1	0.0	623.1	93.5
Antique	0.0	0.0	753.6	0.0	753.6	113.0
Capiz	0.0	0.0	877.4	0.0	877.4	131.6
Iloilo	39.9	1.6	2,291.3	0.0	2,332.8	384.6
Negros Occidental	9.4	98.2	3,207.6	0.0	3,315.2	549.5
Region VII	5.3	68.9	5,411.3	0.0	5,485.5	858.3
Bohol	0.0	9.1	2,657.2	0.0	2,666.3	404.0
Cebu	5.3	59.8	1,565.0	0.0	1,630.1	275.9
Negros Oriental	0.0	0.0	1,108.7	0.0	1,108.7	166.3
Siquijor	0.0	0.0	80.4	0.0	80.4	12.1
Region VIII	0.0	0.0	4,284.4	0.0	4,284.4	642.7
Leyte	0.0	0.0	1,913.1	0.0	1,913.1	287.0
Southern Leyte	0.0	0.0	661.4	0.0	661.4	99.2
Eastern Samar	0.0	0.0	968.8	0.0	968.8	145.3
Northern Samar	0.0	0.0	441.1	0.0	441.1	66.2
Samar	0.0	0.0	300.0	0.0	300.0	45.0
Region IX	0.0	6.1	5,432.0	0.0	5,438.1	818.5
Basilan	0.0	0.0	332.0	0.0	332.0	49.8
Sulu	0.0	0.0	481.8	0.0	481.8	72.3
Tawi-Tawi	0.0	0.0	184.7	0.0	184.7	27.7
Zamboanga del Norte	0.0	0.0	1,710.0	0.0	1,710.0	256.5
Zamboanga del Sur	0.0	6.1	2,723.5	0.0	2,729.6	412.2
Region X	4.5	13.4	8,379.5	0.0	8,397.4	1,269.5
Agusan del Norte	1.6	0.0	596.0	0.0	597.6	91.0
Agusan del Sur	0.0	0.0	766.4	0.0	766.4	115.0
Bukidnon	0.0	1.1	2,898.3	0.0	2,899.4	435.4
Camiguin	0.6	1.1	158.3	0.0	160.0	25.0
Misamis Occidental	0.0	0.0	1,057.6	0.0	1,057.6	158.6
Misamis Oriental	0.6	11.2	2,208.3	0.0	2,220.1	338.6
Surigao del Norte	1.7	0.0	694.6	0.0	696.3	105.9
Region XI	0.0	0.0	8,769.4	0.0	8,769.4	1,315.4
Davao del Norte	0.0	0.0	1,641.1	0.0	1,641.1	246.2
Davao del Sur	0.0	0.0	2,521.0	0.0	2,521.0	378.2
Davao Oriental	0.0	0.0	418.2	0.0	418.2	62.7
South Cotabato	0.0	0.0	3,379.1	0.0	3,379.1	506.9
Surigao del Sur	0.0	0.0	810.0	0.0	810.0	121.5
Region XII	1.3	2.7	7,364.4	0.0	7,368.4	1,107.6
Lanao del Norte	0.3	2.7	1,044.5	0.0	1,047.5	158.6
Lanao del Sur	0.0	0.0	3,456.3	0.0	3,456.3	518.4
Maguindanao	1.0	0.0	1,056.5	0.0	1,057.5	159.5
North Cotabato	0.0	0.0	778.7	0.0	778.7	116.8
Sultan Kudarat	0.0	0.0	1,028.4	0.0	1,028.4	154.3

Appendix 2–2

VARIOUS INDICATORS

Various Indicators (1)

	Topographical Classification	Arable Area Ratio (%)	Population Density (/km2)	Population / Arable Area (/km2)	Urban Population Ratio (%)	Population Growth Rate, (% p.a.)
All Philippines		44.4	191	430	41.0	2.46
NCR	Sea'd-Fl	30.9	11,538	37,362	100.0	2.99
Region I		42.7	188	440	27.5	1.94
Abra	Inl'd-Mt	23.6	46	196	16.9	1.98
Benguet	Inl'd-Mt	16.8	162	966	38.7	2.70
Ilocos Norte	Sea'd-Mt	42.6	129	304	28.6	1.76
Ilocos Sur	Sea'd-Mt	46.7	197	422	18.6	2.01
La Union	Sea'd-Mt	64.0	356	557	19.2	2.32
Mountain Province	Inl'd-Mt	10.0	54	539	4.3	1.28
Pangasinan	Sea'd-Fl	74.8	344	460	32.4	1.73
Region II		28.1	73	259	18.2	2.49
Batanes	Isl'd-Rd	26.7	64	240	27.6	1.55
Cagayan	Sea'd-Fl	37.2	92	248	16.1	2.17
Ifugao	Inl'd-Mt	10.0	51	507	10.5	1.95
Isabela	Inl'd-Fl	42.7	99	231	19.9	2.62
Kalinga-Apayao	Inl'd-Mt	10.3	31	304	13.5	2.53
Nueva Vizcaya	Inl'd-Mt	23.5	76	322	22.9	2.81
Quirino	Inl'd-Mt	12.4	35	284	22.6	3.58
Region III		56.1	314	559	48.9	2.46
Bataan	Sea'd-Mt	50.5	299	593	48.0	3.36
Bulacan	Sea'd-Fl	64.6	508	786	60.7	2.74
Nueva Ecija	Inl'd-Fl	62.6	236	376	29.3	2.13
Pampanga	Sea'd-Fl	73.5	649	882	65.7	2.52
Tarlac	Inl'd-Fl	59.5	257	432	19.3	1.85
Zambales	Sea'd-Mt	30.1	143	476	64.9	2.58
Region IV		42.0	159	379	41.1	2.82
Aurora	Sea'd-Mt	50.0	42	85	25.8	3.54
Batangas	Sea'd-Fl	66.2	433	654	18.9	2.32
Cavite	Sea'd-Fl	55.9	778	1,392	68.2	3.81
Laguna	Sea'd-Fl	62.0	689	1,112	67.9	3.17
Marinduque	Isl'd-Rd	76.9	207	270	15.0	2.04
Occidental Mindoro	Sea'd-Mt	26.2	46	175	16.6	2.70
Oriental Mindoro	Sea'd-Mt	50.9	125	245	14.4	2.64
Palawan	Isl'd-Nr	23.3	31	134	25.0	2.95
Quezon	Sea'd-Mt	48.2	155	321	30.1	2.33
Rizal	Sea'd-Fl	78.7	549	697	81.6	3.43
Romblon	Isl'd-Rd	73.2	158	216	13.7	1.56
Region V		68.5	233	339	24.9	2.34
Albay	Sea'd-Fl	80.7	370	458	25.0	2.18
Camarines Norte	Sea'd-Mt	62.4	175	281	31.4	2.60
Camarines Sur	Sea'd-Fl	68.6	248	362	26.3	2.47
Catanduanes	Isl'd-Rd	48.4	133	274	26.2	1.95
Masbate	Isl'd-Nr	65.0	169	260	17.7	2.22
Sorsogon	Sea'd-Fl	80.8	277	343	25.2	2.41
Region VI		67.6	263	389	30.8	2.29
Aklan	Sea'd-Mt	51.7	208	403	13.6	2.21
Antique	Sea'd-Mt	57.4	161	280	22.3	2.32
Capiz	Sea'd-Fl	61.9	222	359	15.2	2.46
Iloilo	Sea'd-Fl	71.9	312	433	30.2	2.09
Negros Occidental	Sea'd-Fl	73.5	289	393	39.6	2.40
Region VII		55.6	292	524	36.3	1.99
Bohol	Isl'd-Rd	75.2	218	291	16.2	1.60
Cebu	Isl'd-Nr	49.6	476	961	47.8	2.08
Negros Oriental	Sea'd-Mt	46.9	177	377	23.2	2.19
Siquijor	Isl'd-Rd	47.1	228	484	13.3	1.64
Region VIII		44.9	149	331	24.1	1.83
Leyte	Sea'd-Fl	64.0	236	368	27.0	1.79
Southern Leyte	Sea'd-Mt	69.4	202	291	16.9	2.44
Eastern Samar	Sea'd-Mt	31.2	86	276	27.7	2.19
Northern Samar	Sea'd-Mt	33.6	129	384	26.1	2.53
Samar	Sea'd-Mt	33.5	95	283	16.2	.75
Region IX		46.5	160	344	19.0	2.32
Basilan	Isl'd-Rd	57.1	182	318	16.5	2.57
Sulu	Isl'd-Rd	60.6	263	433	18.6	2.10
Tawi-Tawi	Isl'd-Nr	34.7	210	604	11.4	2.29
Zamboanga del Norte	Sea'd-Mt	41.9	113	270	18.5	2.11
Zamboanga del Sur	Sea'd-Mt	46.9	165	351	21.1	2.46
Region X		36.7	118	322	32.2	2.72
Agusan del Norte	Sea'd-Mt	23.9	171	715	38.7	2.68
Agusan del Sur	Inl'd-Fl	24.3	37	151	19.9	3.10
Bukidnon	Inl'd-Mt	38.5	92	240	17.6	2.79
Camiguin	Isl'd-Rd	31.4	269	857	30.8	.91
Misamis Occidental	Sea'd-Mt	64.0	233	364	18.0	2.12
Misamis Oriental	Sea'd-Mt	52.5	239	456	52.3	3.01
Surigao del Norte	Sea'd-Mt	44.0	161	367	35.5	2.70
Region XI		36.2	127	351	36.6	2.69
Davao del Norte	Sea'd-Fl	32.8	105	320	26.4	2.25
Davao del Sur	Sea'd-Mt	34.8	217	625	48.2	2.83
Davao Oriental	Sea'd-Mt	38.3	79	205	25.4	2.53
South Cotabato	Sea'd-Mt	44.1	124	281	35.6	2.56
Surigao del Sur	Sea'd-Mt	28.0	101	350	31.6	2.60
Region XII		40.5	117	290	22.8	2.62
Lanao del Norte	Sea'd-Mt	49.2	181	367	22.4	2.61
Lanao del Sur	Sea'd-Mt	30.9	120	388	18.8	2.28
Maguindanao	Sea'd-Fl	30.6	115	376	30.3	2.41
North Cotabato	Inl'd-Fl	42.9	106	246	17.4	2.75
Sultan Kudarat	Sea'd-Mt	61.6	89	173	25.9	3.18

Various Indicators (2)

	Per Capita GRDP (P)	GRDP/ Area (Tp/km2)	Per Capita Income (P)	Primary Sector Worker Ratio (%)	Secondary Sector Worker Ratio (%)	Tertiary Sector Worker Ratio (%)
All Philippines	10,875	2,077	5,593	51.4	16.3	32.1
NCR	25,210	290,868	10,797	5.8	29.9	62.8
Region I	6,814	1,281	3,734	57.8	13.4	27.8
Abra	6,255	289	4,198	73.4	6.7	19.1
Benguet	8,408	1,364	9,216	42.8	24.7	32.3
Ilocos Norte	6,530	846	6,448	63.6	8.9	25.4
Ilocos Sur	6,613	1,303	4,175	65.2	11.0	22.6
La Union	6,497	2,314	6,461	55.5	13.0	29.9
Mountain Province	8,283	446	5,019	82.1	4.8	12.5
Pangasinan	6,620	2,277	6,182	54.9	13.8	30.0
Region II	5,961	433	5,030	73.0	6.4	19.2
Batanes	6,568	420	6,091	56.1	1.5	20.8
Cagayan	5,932	546	4,632	70.4	6.7	20.6
Ifugao	7,835	398	4,537	86.0	5.2	8.4
Isabela	5,837	575	4,693	71.3	7.2	20.8
Kalinga-Apayao	5,680	179	5,796	83.8	2.6	13.0
Nueva Vizcaya	6,103	461	6,274	68.0	7.6	23.4
Quirino	5,293	186	6,927	79.5	5.3	15.0
Region III	10,244	3,214	6,808	40.1	21.4	36.9
Bataan	11,318	3,387	6,396	34.0	31.5	33.6
Bulacan	12,375	6,285	7,361	29.4	31.5	38.1
Nueva Ecija	8,054	1,898	5,014	62.3	8.0	26.3
Pampanga	10,367	6,724	7,483	30.2	25.8	42.6
Tarlac	9,449	2,428	4,931	52.2	13.0	33.4
Zambales	10,060	1,440	10,982	32.5	15.8	50.4
Region IV	12,332	1,965	5,514	47.4	20.9	30.7
Aurora	8,672	367	3,134	72.0	5.0	22.5
Batangas	13,666	5,915	5,431	44.8	21.7	32.8
Cavite	14,489	11,272	7,157	31.0	29.7	38.6
Laguna	14,226	9,805	7,396	32.7	27.9	38.6
Marinduque	10,357	2,149	3,505	59.0	15.4	23.5
Occidental Mindoro	8,903	407	6,935	73.0	6.0	20.7
Oriental Mindoro	8,498	1,062	4,049	68.2	6.8	21.7
Palawan	8,891	277	3,901	74.8	6.7	17.9
Quezon	10,418	1,611	3,763	64.4	11.4	23.5
Rizal	15,139	8,309	6,974	19.4	40.8	38.3
Romblon	11,325	1,791	3,056	59.8	17.6	22.2
Region V	5,131	1,194	3,447	66.2	9.8	23.0
Albay	5,780	2,138	3,868	55.3	16.8	28.3
Camarines Norte	5,231	916	3,454	60.5	11.8	26.9
Camarines Sur	4,984	1,238	3,604	67.3	8.0	23.8
Catanduanes	5,073	672	3,449	68.7	6.8	24.4
Masbate	4,682	792	3,018	79.7	4.2	15.7
Sorsogon	4,901	1,359	2,918	70.2	7.7	20.9
Region VI	8,463	2,225	4,294	60.5	9.6	28.6
Aklan	9,018	1,879	5,133	60.5	12.2	25.9
Antique	7,928	1,275	3,255	67.7	9.9	21.1
Capiz	7,781	1,730	3,802	67.2	7.9	24.6
Iloilo	8,464	2,637	4,765	58.6	9.2	30.4
Negros Occidental	8,840	2,494	4,122	59.0	9.9	30.1
Region VII	9,668	2,818	3,878	56.9	15.4	27.0
Bohol	8,333	1,820	3,151	63.6	14.8	20.5
Cebu	11,316	5,391	4,125	47.9	19.2	32.6
Negros Oriental	6,951	1,231	3,968	73.6	6.6	18.5
Siquijor	7,182	1,639	3,572	72.9	5.1	21.6
Region VIII	4,502	869	3,281	71.5	6.9	20.5
Leyte	4,741	1,118	3,456	68.0	8.0	22.7
Southern Leyte	4,210	852	3,363	72.7	5.6	20.7
Eastern Samar	4,128	356	3,236	75.1	5.3	19.2
Northern Samar	3,793	490	2,372	75.1	4.5	18.7
Samar	4,899	464	3,532	74.9	7.0	16.9
Region IX	7,108	1,152	4,110	73.1	5.6	20.1
Basilan	6,727	1,221	2,935	75.9	4.7	18.2
Sulu	7,187	1,889	3,836	77.0	7.8	14.6
Tawi-Tawi	5,627	1,180	4,681	82.3	3.6	13.5
Zamboanga del Norte	7,217	817	3,805	77.2	4.1	17.5
Zamboanga del Sur	7,526	1,238	4,547	68.1	6.1	24.3
Region X	9,520	1,125	4,873	65.0	8.6	25.0
Agusan del Norte	11,108	1,895	4,347	52.6	15.6	30.2
Agusan del Sur	7,004	257	4,191	80.8	3.5	14.7
Bukidnon	7,563	698	5,653	80.1	3.8	15.3
Camiguin	10,409	2,802	2,742	67.5	5.3	26.1
Misamis Occidental	10,588	2,463	2,909	62.7	7.8	28.4
Misamis Oriental	11,256	2,695	6,335	51.1	12.4	34.3
Surigao del Norte	8,625	1,392	4,083	70.8	7.7	20.5
Region XI	11,172	1,421	5,190	66.1	8.8	24.4
Davao del Norte	10,396	1,090	4,966	77.3	5.4	16.8
Davao del Sur	13,042	2,836	5,933	53.0	13.1	33.5
Davao Oriental	9,000	708	4,089	78.4	3.8	16.2
South Cotabato	10,442	1,293	5,429	70.2	6.8	22.3
Surigao del Sur	10,354	1,048	3,882	66.8	10.5	21.3
Region XII	8,397	984	4,089	70.8	8.0	20.4
Lanao del Norte	9,823	1,776	3,968	57.0	13.1	27.5
Lanao del Sur	8,961	1,076	5,158	62.1	14.4	23.9
Maguindanao	8,255	951	3,603	74.0	6.4	19.2
North Cotabato	7,689	812	3,603	79.7	3.1	16.7
Sultan Kudarat	7,146	638	4,645	81.5	3.7	14.5

Various Indicators (3)

	Un-employ-ment Ratio (%)	Under-employ-ment Ratio (%)	Un- & Under-employ't Ratio (%)	Elemen-tary Classroom /1,000 popul.	Hospital Bed /1,000 popul.	Social Facility Ratio	Incidence of Poverty (%)
All Philippines	8.3	11.6	19.9	4.44	1.52	1.00	59.3
NCR	17.2	3.4	20.6	1.31	3.73	1.38	44.1
Region I	6.8	12.6	19.4	6.15	1.53	1.20	52.3
Abra	4.8	8.8	13.6	7.45	2.43	1.64	66.6
Benguet	2.7	3.3	6.0	5.17	2.69	1.47	36.1
Ilocos Norte	7.8	19.3	27.1	6.29	2.88	1.54	54.6
Ilocos Sur	6.4	10.3	16.7	6.12	1.27	1.11	62.4
La Union	9.0	11.4	20.4	5.64	1.32	1.07	42.8
Mountain Province	4.3	.0	4.3	9.51	2.63	1.94	57.1
Pangasinan	7.4	15.7	23.1	6.40	.91	1.02	53.7
Region II	5.2	6.4	11.6	5.11	1.16	.96	54.6
Batanes	.0	.0	.0	15.23	7.46	4.17	74.2
Cagayan	7.0	9.3	16.3	5.13	1.24	.98	55.0
Ifugao	4.8	3.3	8.1	7.70	1.65	1.41	66.3
Isabela	2.9	3.4	6.3	4.49	.72	.74	51.7
Kalinga-Apayao	9.1	1.1	10.2	5.24	2.25	1.33	60.5
Nueva Vizcaya	6.6	16.8	23.4	5.08	1.12	.94	52.4
Quirino	6.7	2.4	9.1	6.42	1.49	1.21	53.7
Region III	9.6	7.5	17.1	4.48	1.00	.83	44.4
Bataan	17.4	.8	18.2	4.44	1.01	.83	47.2
Bulacan	10.7	8.7	19.4	4.32	1.10	.85	36.5
Nueva Ecija	6.9	11.4	18.3	4.29	.80	.75	55.1
Pampanga	8.8	6.3	15.1	4.41	1.07	.85	36.5
Tarlac	9.0	6.2	15.2	5.40	.94	.92	56.2
Zambales	8.8	3.5	12.3	4.17	1.15	.85	38.3
Region IV	8.4	12.9	21.3	4.42	1.00	.83	55.9
Aurora	5.5	2.0	7.5	5.49	.88	.91	82.0
Batangas	11.4	19.8	31.2	5.23	1.05	.94	52.4
Cavite	5.8	.3	6.1	4.34	.84	.77	31.4
Laguna	12.8	5.6	18.4	3.63	1.17	.80	38.8
Marinduque	14.7	12.3	27.0	7.64	.75	1.11	82.5
Occidental Mindoro	.0	1.8	1.8	5.11	.97	.89	81.8
Oriental Mindoro	7.7	18.5	26.2	4.41	.54	.67	70.5
Palawan	2.0	9.0	11.0	5.36	.58	.79	72.0
Quezon	7.2	18.1	25.3	3.67	1.25	.82	72.5
Rizal	7.3	8.2	15.5	3.12	.99	.68	49.7
Romblon	5.6	56.4	62.0	6.56	1.17	1.12	83.0
Region V	5.6	17.2	22.8	5.38	1.21	1.00	73.2
Albay	6.9	9.7	16.6	4.70	1.54	1.04	68.8
Camarines Norte	4.4	28.8	33.2	4.57	1.14	.89	69.6
Camarines Sur	6.0	21.9	27.9	5.58	1.23	1.03	71.5
Catanduanes	3.7	13.8	17.5	7.30	2.07	1.51	72.1
Masbate	3.5	9.2	12.7	5.18	.77	.84	78.9
Sorsogon	6.5	20.0	26.5	6.11	.88	.98	79.5
Region VI	7.3	19.8	27.1	5.38	.88	.90	73.1
Aklan	5.2	14.2	19.4	5.34	.86	.88	68.2
Antique	11.0	13.2	24.2	6.77	.64	.97	80.1
Capiz	6.6	12.0	18.6	6.33	.82	.98	74.0
Iloilo	6.4	31.0	37.4	4.88	1.15	.93	69.4
Negros Occidental	8.1	14.7	22.8	5.25	.75	.84	75.1
Region VII	6.7	7.5	13.2	4.31	1.42	.95	68.8
Bohol	3.5	1.2	4.7	5.57	1.33	1.08	74.8
Cebu	6.3	5.1	11.4	3.92	1.67	.99	66.2
Negros Oriental	6.2	18.3	24.5	3.62	.86	.69	68.5
Siquijor	.0	7.9	7.9	9.54	1.47	1.56	86.9
Region VIII	6.0	16.6	22.6	5.90	.94	.97	70.4
Leyte	5.5	17.3	22.8	5.62	1.02	.97	68.0
Southern Leyte	10.3	12.2	22.5	6.80	1.22	1.17	69.9
Eastern Samar	10.9	15.1	26.0	6.21	1.11	1.06	76.6
Northern Samar	2.3	11.5	13.8	3.76	.85	.70	74.9
Samar	5.3	22.9	28.2	7.68	.51	1.03	69.6
Region IX	5.2	4.6	9.8	4.12	1.03	.80	65.3
Basilan	4.3	.0	4.3	5.09	.97	.89	78.4
Sulu	4.3	.0	4.3	3.07	1.14	.72	63.0
Tawi-Tawi	2.3	11.6	13.9	3.00	.54	.51	66.0
Zamboanga del Norte	4.0	4.6	8.6	5.54	1.81	1.22	70.6
Zamboanga del Sur	6.7	5.2	11.9	3.74	.71	.66	60.9
Region X	7.6	12.3	19.9	5.04	1.50	1.06	66.2
Agusan del Norte	11.7	13.3	25.0	5.13	1.99	1.23	64.1
Agusan del Sur	4.8	3.6	8.4	5.14	.91	.88	68.7
Bukidnon	9.1	20.9	30.0	3.94	1.07	.80	51.6
Camiguin	4.3	4.5	8.8	9.29	2.26	1.79	88.3
Misamis Occidental	5.3	12.5	17.8	6.60	2.91	1.70	78.4
Misamis Oriental	8.2	10.5	18.7	4.57	1.10	.88	68.3
Surigao del Norte	4.3	6.3	10.6	5.49	1.45	1.10	71.6
Region XI	8.1	13.3	21.4	4.36	1.57	1.01	61.7
Davao del Norte	2.4	10.0	12.4	4.31	1.79	1.08	59.9
Davao del Sur	11.1	6.7	17.8	4.22	2.10	1.17	62.5
Davao Oriental	2.4	11.6	14.0	4.36	.87	.78	66.8
South Cotabato	10.8	25.1	35.9	4.16	.94	.78	57.1
Surigao del Sur	9.6	13.5	23.1	5.30	1.42	1.07	67.7
Region XII	4.7	20.4	25.1	4.73	1.39	.99	65.2
Lanao del Norte	9.1	27.8	36.9	5.24	1.07	.94	66.3
Lanao del Sur	3.5	1.5	5.0	7.88	.66	1.10	56.0
Maguindanao	3.8	4.9	8.7	2.87	.27	.41	68.4
North Cotabato	3.8	43.0	46.8	2.93	2.51	1.16	74.3
Sultan Kudarat	2.0	2.7	4.7	6.50	2.55	1.57	54.8

Various Indicators (4)

	Major Crop	Palay Yield (t/ha)	Corn Yield (t/ha)	SugarCane Yield (kg/ha)	Coconut Yield (nut/tree)	Unutilized Agric. Area Ratio (%)	Accessibility to MM/Cebu/Davao	Agric. Productivity (1) (%)	Agric. Productivity (2) (%)
All Philippines	Palay	2.16	1.15	48.0	32.3	39.1	.50	57.1	43.2
NCR	Palay	2.66	1.96	46.7	33.6	.0	.92	76.6	76.6
Region I	Palay	2.00	1.09	25.9	17.1	60.5	.47	58.8	34.2
Abra	Palay	1.61	1.65	1.4	10.9	75.1	.42	52.9	23.3
Benguet	Palay	1.64	1.00	-	122.1	7.0	.53	49.4	47.5
Ilocos Norte	Palay	2.88	1.05	19.0	15.6	72.7	.38	81.8	40.9
Ilocos Sur	Palay	1.95	.72	2.7	13.1	64.9	.46	55.4	29.9
La Union	Palay	2.50	.89	4.2	18.9	58.1	.51	73.3	43.0
Mountain Province	Palay	2.02	1.21	4.0	12.0	10.7	.46	58.7	55.6
Pangasinan	Palay	1.80	1.07	40.1	17.2	60.4	.60	53.4	27.9
Region II	Palay	2.18	1.08	14.3	23.3	71.9	.41	60.8	29.6
Batanes	Coconut	2.00	1.92	8.8	9.1	59.1	.24	47.7	35.3
Cagayan	Palay	1.89	1.08	15.2	23.4	77.7	.39	54.0	23.0
Ifugao	Palay	1.55	1.18	2.0	27.9	32.7	.49	48.3	39.0
Isabela	Palay	2.36	.99	12.5	32.6	75.3	.46	63.2	26.3
Kalinga-Apayao	Palay	2.27	1.69	5.6	18.8	45.3	.41	68.5	51.2
Nueva Vizcaya	Palay	2.55	1.16	.9	14.8	68.6	.55	72.8	33.2
Quirino	Palay	1.85	1.26	21.9	14.8	66.5	.55	55.2	28.5
Region III	Palay	2.60	1.46	8.6	17.2	56.9	.75	75.7	38.0
Bataan	Palay	2.65	1.29	4.7	10.4	71.9	.80	77.8	25.5
Bulacan	Palay	2.38	1.45	29.5	39.1	63.0	.86	71.9	29.3
Nueva Ecija	Palay	2.87	1.18	11.8	24.9	47.8	.69	86.4	53.1
Pampanga	Palay	2.69	2.43	7.6	15.9	57.9	.80	69.9	33.3
Tarlac	Palay	2.22	1.38	10.0	35.5	49.7	.69	62.6	37.3
Zambales	Palay	1.91	.86	7.9	12.8	75.9	.67	57.0	18.3
Region IV	Coconut	1.94	1.01	24.1	24.5	43.7	.53	46.5	32.9
Aurora	Palay	1.79	.73	.7	19.3	83.2	.60	47.6	12.0
Batangas	Palay	1.42	.84	19.4	33.2	40.2	.77	39.7	26.1
Cavite	Palay	2.82	1.90	58.5	36.2	34.6	.89	79.8	54.3
Laguna	Coconut	3.12	1.51	35.3	32.1	39.1	.80	67.9	44.8
Marinduque	Coconut	1.08	.62	.0	24.4	54.8	.48	35.7	22.6
Occidental Mindoro	Palay	2.41	.98	.5	15.5	39.9	.45	67.6	52.0
Oriental Mindoro	Palay	1.87	.99	.2	31.4	43.0	.45	53.5	39.8
Palawan	Palay	1.52	1.05	4.4	35.6	42.2	.26	48.0	40.3
Quezon	Coconut	1.61	1.03	1.5	21.8	24.9	.65	36.9	30.3
Rizal	Palay	2.04	1.44	18.5	10.6	73.2	.89	60.2	17.5
Romblon	Coconut	1.49	.59	6.0	17.1	51.8	.40	31.9	22.3
Region V	Coconut	1.95	.74	47.0	28.7	3.9	.41	47.9	47.1
Albay	Coconut	2.01	.89	44.8	37.4	3.7	.43	56.5	55.6
Camarines Norte	Coconut	2.55	.83	28.1	19.1	1.7	.55	38.7	38.4
Camarines Sur	Palay	2.13	.94	49.2	25.5	3.8	.47	52.8	51.8
Catanduanes	Palay	1.43	.89	15.4	18.4	14.3	.34	38.3	36.1
Masbate	Coconut	.84	.63	2.1	31.8	3.3	.33	36.1	35.7
Sorsogon	Coconut	2.28	.95	24.7	32.9	3.3	.39	56.7	56.0
Region VI	Palay	2.07	.68	66.3	26.0	30.4	.47	62.2	51.6
Aklan	Palay	1.88	.81	.2	32.5	39.6	.43	53.7	41.9
Antique	Palay	1.72	.31	25.5	22.6	40.0	.44	46.2	35.7
Capiz	Palay	2.53	.86	54.8	30.4	32.1	.47	72.2	59.0
Iloilo	Palay	1.98	.53	29.8	13.3	18.0	.49	53.4	48.2
Negros Occidental	Sugar	2.15	.79	73.7	23.7	34.3	.55	73.1	56.9
Region VII	Corn	1.52	.90	30.2	26.2	27.5	.60	40.8	33.2
Bohol	Palay	1.36	.71	9.0	29.1	49.1	.60	40.0	25.3
Cebu	Corn	1.40	.92	47.5	22.4	26.3	.89	39.5	30.0
Negros Oriental	Corn	2.21	.92	27.7	31.1	.9	.52	43.4	43.2
Siquijor	Corn	.74	.61	-	15.1	46.5	.51	25.5	17.7
Region VIII	Coconut	1.80	.99	54.1	30.5	29.9	.45	49.7	41.7
Leyte	Palay	1.88	.86	54.6	25.9	21.1	.52	47.3	42.0
Southern Leyte	Coconut	3.00	1.38	.7	39.8	41.6	.51	68.8	50.4
Eastern Samar	Coconut	1.45	.57	4.3	38.6	41.0	.43	54.7	42.2
Northern Samar	Coconut	1.40	1.43	18.1	27.5	16.5	.41	42.5	39.3
Samar	Coconut	1.67	1.39	.8	30.9	43.4	.44	50.4	37.8
Region IX	Coconut	1.91	.85	2.0	38.5	26.0	.33	50.1	44.9
Basilan	Coconut	1.76	1.56	5.9	46.9	27.0	.33	70.8	63.1
Sulu	Coconut	.72	.52	4.7	32.8	15.0	.29	43.4	41.3
Tawi-Tawi	Coconut	1.73	2.56	2.6	46.5	14.8	.24	70.2	67.3
Zamboanga del Norte	Coconut	1.47	.91	1.0	44.0	26.0	.42	51.4	44.8
Zamboanga del Sur	Corn	2.20	.82	.3	32.6	29.6	.45	47.5	39.9
Region X	Corn	1.82	1.13	59.5	38.5	31.2	.53	53.1	42.8
Agusan del Norte	Coconut	1.88	.87	.9	35.2	30.4	.53	49.4	40.1
Agusan del Sur	Corn	1.56	1.17	2.2	24.8	45.8	.63	48.8	31.8
Bukidnon	Corn	1.84	1.28	60.7	21.5	15.8	.67	56.3	50.1
Camiguin	Coconut	1.93	.96	-	26.4	37.1	.48	42.8	33.3
Misamis Occidental	Coconut	2.72	.77	11.1	30.1	43.2	.49	49.5	36.1
Misamis Oriental	Coconut	1.46	.73	21.2	45.8	31.6	.56	46.7	37.1
Surigao del Norte	Coconut	1.83	1.25	.5	45.5	36.0	.44	65.0	52.0
Region XI	Coconut	3.00	1.35	47.8	42.9	14.0	.69	67.7	60.9
Davao del Norte	Corn	2.82	1.21	17.4	53.7	7.3	.75	69.5	65.8
Davao del Sur	Coconut	3.75	1.47	48.5	37.6	10.0	.86	67.9	62.0
Davao Oriental	Coconut	2.33	.93	1.4	44.3	21.6	.69	57.9	48.7
South Cotabato	Corn	3.30	1.45	35.6	65.3	22.9	.69	75.1	62.4
Surigao del Sur	Coconut	1.82	1.03	.4	27.0	5.5	.53	47.2	45.7
Region XII	Corn	2.24	1.62	37.8	44.0	41.1	.65	68.9	47.4
Lanao del Norte	Coconut	1.76	1.21	1.7	46.4	37.8	.56	58.3	43.5
Lanao del Sur	Palay	1.98	1.56	.4	49.0	16.7	.62	65.1	57.9
Maguindanao	Corn	2.07	2.20	53.7	58.8	31.6	.63	83.9	64.9
North Cotabato	Palay	2.27	1.24	37.9	33.6	40.7	.80	61.0	39.4
Sultan Kudarat	Palay	2.78	1.79	37.1	20.4	64.4	.65	76.9	35.3

Various Indicators (5)

	Road Density L/A (km/km2)	Road Density L/Aar (km/km2)	Road Density L'/A (km/km2)	Road Density L'/Aar (km/km2)	Road Density L"/A (km/km2)	Road Density L"/Aar (km/km2)	Road Density L/√P·A (km / √Tpop·km2)	Road Density L'/√P·A (km / √Tpop·km2)	Road Density L"/√P·A (km / √Tpop·km2)	Road Density L/I√P·A (km/Tp· √Tpop·km2)	Road Density L'/I√P·A (km/Tp· √Tpop·km2)	Road Density L"/I√P· (km/Tp √Tpop·km2
All Philippines	.526	1.183	.141	.317	.074	.166	1.203	.322	.168	.2150	.0576	.030
NCR	4.574	14.812	3.128	10.130	3.868	12.525	1.347	.921	1.139	.1247	.0853	.105
Region I	.787	1.842	.196	.459	.116	.271	1.815	.453	.267	.3166	.0790	.046
Abra	.561	1.375	.101	.427	.035	.147	2.611	.469	.161	.6219	.1117	.038
Benguet	.667	3.988	.195	1.162	.171	1.018	1.465	.486	.425	.1796	.0526	.046
Ilocos Norte	.904	2.120	.233	.546	.106	.249	2.512	.647	.295	.3695	.1003	.045
Ilocos Sur	1.090	2.334	.234	.501	.112	.241	2.456	.527	.253	.6882	.1282	.060
La Union	.823	1.286	.259	.406	.206	.320	1.379	.435	.343	.2134	.0673	.053
Mountain Province	.361	3.821	.094	.939	.031	.308	*1.643*	*.404*	*.132*	*.3274*	.0804	.026
Pangasinan	.943	1.262	.249	.333	.165	.220	1.608	.425	.281	.3103	.0819	.054
Region II	.354	1.258	.084	.301	.026	.093	1.311	.313	.097	.2607	.0623	.019
Batanes	1.324	4.966	.330	1.238	.174	.654	5.233	1.304	.689	.8591	.2141	.113
Cagayan	.384	1.033	.100	.270	.041	.112	1.265	.331	.137	.2732	.0714	.029
Ifugao	.391	3.902	.083	.832	.022	.216	1.734	.370	.096	.3821	.0815	.021
Isabela	.352	.824	.088	.206	.029	.069	1.120	.280	.093	.2387	.0596	.019
Kalinga-Apayao	.188	1.822	.038	.363	.004	.036	1.061	.212	.021	.1831	.0365	.003
Nueva Vizcaya	.616	2.621	.132	.563	.035	.149	2.239	.481	.127	.3569	.0767	.020
Quirino	.220	1.779	.057	.464	.005	.038	1.173	.306	.025	*.1694*	*.0442*	*.002*
Region III	.717	1.277	.221	.393	.144	.257	1.280	.394	.257	.1881	.0579	.037
Bataan	.783	1.550	.309	.611	.277	.549	1.431	.564	.506	.2237	.0882	.079
Bulacan	.969	1.500	.354	.549	.270	.418	1.360	.497	.379	.1848	.0678	.051
Nueva Ecija	.611	.976	.174	.279	.065	.104	1.269	.359	.134	.2510	.0717	.026
Pampanga	1.091	1.484	.318	.432	.213	.289	1.355	.394	.264	.1811	.0527	.035
Tarlac	.837	1.407	.213	.358	.120	.202	1.650	.420	.238	.3347	.0852	.048
Zambales	.348	1.155	.110	.366	.097	.323	.919	.291	.257	.0837	.0265	.023
Region IV	.391	.931	.118	.281	.074	.176	.980	.295	.185	.1777	.0536	.033
Aurora	.195	.390	.049	.098	.010	.021	.946	.237	.050	.3020	.0756	.016
Batangas	1.154	1.743	.345	.522	.310	.469	1.754	.525	.472	.3230	.0987	.086
Cavite	1.249	2.235	.449	.803	.425	.761	1.416	.509	.482	.1979	.0711	.067
Laguna.	.838	1.347	.385	.620	.372	.600	1.006	.463	.448	.1360	.0626	.060
Marinduque	*.693*	*.902*	*.206*	*.268*	*.113*	*.147*	*1.523*	*.452*	*.249*	*.4344*	*.1289*	*.071*
Occidental Mindoro	.273	1.043	.061	.232	.005	.020	1.276	.284	.024	.1842	.0409	.003
Oriental Mindoro	.303	.594	.093	.183	.035	.068	.856	.263	.099	.2113	.0650	.024
Palawan	.176	.755	.038	.163	.002	.009	.995	.214	.012	.2551	.0549	.003
Quezon	.243	.503	.084	.174	.048	.099	.817	.213	.121	.1641	.0567	.032
Rizal	.945	1.201	.355	.451	.313	.398	1.276	.479	.422	.1830	.0686	.060
Romblon	1.057	1.444	.293	.318	.070	.096	2.658	.585	.175	.8696	.1914	.057
Region V	.489	.713	.155	.226	.103	.151	1.013	.321	.214	.2939	.0932	.062
Albay	.642	.795	.234	.290	.191	.236	1.055	.385	.313	.2727	.0996	.081
Camarines Norte	*.344*	*.551*	*.142*	*.227*	*.131*	*.209*	*.822*	*.338*	*.312*	*.2379*	*.0980*	*.090*
Camarines Sur	.651	.949	.187	.272	.168	.157	1.307	.375	.216	.3625	.1040	.060
Catanduanes	.521	1.078	.138	.285	.043	.090	1.432	.378	.119	.4153	.1096	.034
Masbate	.249	.384	.064	.098	.027	.041	.606	.156	.065	.2008	.0515	.021
Sorsogon	.479	.592	.179	.222	.149	.184	.909	.340	.283	.3116	.1166	.096
Region VI	.691	1.022	.190	.281	.095	.141	1.348	.371	.186	.3140	.0863	.043
Aklan	.622	1.203	.166	.322	.066	.127	1.363	.364	.144	.2658	.0710	.028
Antique	.520	.905	.134	.233	.047	.082	1.295	.334	.118	.3980	.1026	.036
Capiz	.630	1.017	.164	.265	.069	.112	1.336	.349	.147	.3513	.0917	.038
Iloilo	.817	1.137	.236	.328	.113	.164	1.464	.422	.212	.3072	.0885	.044
Negros Occidental	.698	.949	.191	.260	.111	.150	1.298	.356	.205	.3149	.0864	.049
Region VII	.720	1.294	.192	.348	.108	.194	1.333	.355	.199	.3437	.0917	.051
Bohol	1.100	1.463	.250	.333	.090	.120	2.353	.535	.193	.7466	.1629	.061
Cebu	.742	1.496	.230	.463	.183	.328	1.075	.333	.236	.2607	.0807	.057
Negros Oriental	.388	.825	.104	.221	.068	.145	.922	.247	.162	.2323	.0622	.040
Siquijor	1.052	2.232	.317	.674	.126	.268	2.202	.665	.264	.5166	.1860	.074
Region VIII	.394	.877	.121	.269	.066	.147	1.021	.313	.171	.3112	.0955	.052
Leyte	.607	.948	.187	.293	.085	.133	1.250	.386	.176	.3617	.1117	.050
Southern Leyte	.783	1.128	.265	.381	.237	.342	1.741	.588	.527	.5178	.1749	.156
Eastern Samar	.372	1.190	.084	.269	.026	.083	1.256	.286	.089	.3913	.0885	.027
Northern Samar	.265	.756	.080	.237	.041	.121	.736	.222	.113	.3102	.0937	.047
Samar	.131	.392	.055	.166	.038	.114	.427	.180	.124	.1208	.0511	.035
Region IX	.509	1.095	.113	.242	.033	.071	1.272	.281	.083	.3095	.0684	.020
Basilan	.506	.886	.102	.179	.043	.075	1.187	.239	.100	.4044	.0815	.034
Sulu	.533	.879	.132	.218	.061	.100	1.040	.258	.118	.2711	.0674	.030
Tawi-Tawi	.306	.881	.065	.186	.014	.041	.668	.141	.031	.1427	.0302	.001
Zamboanga del Norte	.522	1.244	.115	.275	.020	.049	1.551	.343	.061	.4302	.0952	.018
Zamboanga del Sur	.522	1.111	.114	.244	.038	.080	1.286	.282	.093	.2828	.0820	.020
Region X	.522	1.425	.124	.339	.047	.130	1.520	.361	.138	.3119	.0742	.021
Agusan del Norte	*.464*	*1.945*	*.147*	*.617*	*.063*	*.265*	1.124	.357	.153	.2586	.0820	.035
Agusan del Sur	.187	.585	.046	.188	.021	.085	.870	.239	.108	.2077	.0570	.025
Bukidnon	.567	1.473	.111	.287	.019	.050	1.866	.364	.063	.3300	.0644	.011
Camiguin	1.506	4.792	.390	1.243	.310	.986	2.902	.753	.597	1.0583	.2745	.217
Misamis Occidental	1.053	1.647	.229	.359	.093	.145	2.184	.476	.193	.7507	.1635	.061
Misamis Oriental	.952	1.814	.240	.458	.131	.250	1.945	.491	.268	.3070	.0775	.043
Surigao del Norte	.590	1.341	.152	.346	.043	.097	1.468	.378	.106	.3596	.0927	.025
Region XI	.488	1.348	.106	.292	.025	.068	1.368	.296	.069	.2636	.0571	.013
Davao del Norte	.374	1.142	.095	.290	.024	.072	1.155	.294	.073	.2331	.0593	.015
Davao del Sur	*.625*	*1.797*	*.139*	*.460*	*.050*	*.163*	1.340	.298	.106	*.2252*	*.0502*	*.018*
Davao Oriental	.261	.681	.061	.159	.005	.012	.932	.217	.017	.2282	.0533	.004
South Cotabato	.744	1.687	.135	.306	.026	.060	2.113	.383	.075	.3892	.0705	.013
Surigao del Sur	.336	1.159	.081	.278	.011	.039	1.055	.253	.036	.2717	.0652	.009
Region XII	.512	1.265	.100	.248	.024	.059	1.496	.293	.070	.3658	.0716	.017
Lanao del Norte	.673	1.164	.143	.290	.045	.091	1.347	.335	.106	.3396	.0845	.027
Lanao del Sur	1.143	3.696	.186	.602	.018	.058	3.299	.538	.051	.6395	.1042	.010
Maguindanao	.327	1.067	.068	.221	.024	.079	.963	.200	.071	.2674	.0555	.019
North Cotabato	.309	.721	.071	.165	.026	.060	.952	.218	.079	.2643	.0605	.024
Sultan Kudarat	*.445*	*.863*	*.078*	*.152*	*.011*	*.021*	1.490	*.262*	*.036*	*.3208*	*.0564*	*.009*

Various Indicators (6)

	Road Density L'/√P·A (Nat'l)	Road Density L'/√P·A (Prov'l)	Road Density L'/√P·A (City)	Road Density L'/√P·A (Mun'l)	Road Density L'/√P·A (Bar'y)	Road Density L'/√P·A (Nat'l, Prov,City)	Road Density L'/√P·A (Mun'l, Bar'y)	Road Density L'/√P·A (All Roads)	L'/L Ratio (Nat'l, Prov,City)	L'/L Ratio (Mun'l, Bar'y)	L'/L Ratio (All Roads)
All Philippines	.104	.064	.017	.035	.102	.185	.136	.322	.41	.18	.27
NCR	.326	.000	.384	.195	.016	.710	.211	.921	.71	.81	.68
Region I	.138	.089	.016	.044	.165	.243	.210	.453	.41	.17	.25
Abra	.079	.112	.000	.048	.230	.191	.278	.469	.24	.15	.18
Benguet	.207	.067	.080	.002	.129	.354	.131	.485	.40	.17	.29
Ilocos Norte	.213	.082	.041	.079	.233	.335	.312	.647	.45	.18	.26
Ilocos Sur	.148	.069	.000	.063	.260	.204	.323	.527	.37	.17	.21
La Union	.156	.121	.000	.040	.117	.278	.157	.435	.53	.18	.32
Mountain Province	.220	.124	.000	.006	.053	.344	.060	.404	.28	.14	.25
Pangasinan	.103	.105	.006	.031	.159	.214	.210	.425	.49	.18	.26
Region II	.115	.054	.000	.031	.114	.168	.145	.313	.39	.17	.24
Batanes	.510	.142	.000	.303	.349	.652	.652	1.304	.27	.24	.25
Cagayan	.123	.068	.000	.022	.117	.191	.140	.331	.47	.16	.26
Ifugao	.199	.016	.000	.007	.148	.215	.155	.370	.30	.15	.21
Isabela	.082	.055	.000	.038	.104	.138	.142	.280	.46	.17	.26
Kalinga-Apayao	.097	.028	.000	.007	.080	.124	.088	.212	.27	.15	.20
Nueva Vizcaya	.152	.072	.000	.056	.201	.224	.257	.481	.35	.16	.21
Quirino	.152	.051	.000	.044	.068	.203	.103	.306	.32	.19	.26
Region III	.119	.094	.014	.046	.121	.227	.167	.394	.54	.20	.31
Bataan	.298	.122	.000	.039	.104	.420	.144	.564	.61	.20	.39
Bulacan	.113	.117	.000	.001	.176	.230	.267	.497	.71	.26	.37
Nueva Ecija	.116	.091	.008	.042	.102	.215	.144	.359	.47	.18	.29
Pampanga	.109	.084	.040	.031	.131	.233	.162	.394	.56	.17	.29
Tarlac	.099	.123	.000	.036	.161	.223	.197	.420	.45	.17	.25
Zambales	.098	.058	.034	.037	.064	.191	.101	.291	.51	.18	.33
Region IV	.103	.069	.008	.035	.081	.180	.116	.296	.41	.21	.30
Aurora	.108	.054	.000	.020	.054	.162	.075	.237	.32	.17	.25
Batangas	.141	.130	.011	.050	.194	.282	.244	.525	.50	.21	.30
Cavite	.173	.142	.042	.044	.109	.357	.152	.509	.49	.22	.36
Laguna	.159	.094	.029	.074	.107	.282	.181	.463	.61	.33	.46
Marinduque	.191	.128	.000	.085	.048	.320	.132	.452	.36	.21	.30
Occidental Mindoro	.089	.069	.000	.031	.095	.158	.126	.284	.29	.17	.22
Oriental Mindoro	.080	.145	.000	.015	.024	.225	.039	.263	.34	.19	.31
Palawan	.055	.053	.008	.009	.079	.126	.088	.214	.30	.16	.22
Quezon	.111	.030	.003	.032	.017	.144	.069	.213	.45	.23	.35
Rizal	.185	.021	.000	.104	.168	.207	.272	.479	.64	.28	.38
Romblon	.166	.113	.000	.080	.226	.279	.306	.585	.27	.19	.22
Region V	.132	.065	.013	.039	.073	.209	.112	.321	.45	.21	.32
Albay	.170	.080	.009	.047	.080	.259	.126	.385	.51	.23	.37
Camarines Norte	.154	.068	.000	.050	.056	.232	.106	.338	.64	.23	.41
Camarines Sur	.106	.087	.035	.038	.109	.228	.147	.375	.44	.19	.29
Catanduanes	.173	.091	.000	.048	.067	.263	.115	.378	.30	.20	.26
Masbate	.080	.016	.000	.020	.040	.096	.059	.156	.33	.19	.26
Sorsogon	.184	.055	.000	.049	.052	.239	.101	.340	.49	.24	.37
Region VI	.120	.075	.019	.034	.123	.214	.157	.371	.41	.19	.27
Aklan	.090	.112	.000	.050	.113	.202	.163	.364	.39	.19	.27
Antique	.139	.030	.000	.053	.112	.169	.165	.334	.37	.20	.26
Capiz	.124	.072	.015	.031	.106	.211	.137	.349	.37	.18	.26
Iloilo	.152	.087	.010	.044	.129	.249	.174	.422	.41	.20	.29
Negros Occidental	.099	.071	.035	.022	.129	.205	.151	.356	.44	.18	.27
Region VII	.101	.086	.023	.040	.106	.209	.146	.355	.39	.18	.27
Bohol	.131	.129	.020	.045	.210	.281	.255	.535	.34	.17	.23
Cebu	.095	.082	.032	.046	.079	.209	.124	.333	.42	.21	.31
Negros Oriental	.089	.042	.013	.030	.073	.144	.103	.247	.43	.18	.27
Siquijor	.187	.355	.000	.049	.073	.542	.122	.665	.34	.20	.30
Region VIII	.126	.061	.006	.042	.078	.193	.120	.313	.45	.20	.31
Leyte	.169	.058	.012	.053	.094	.239	.147	.386	.47	.20	.31
Southern Leyte	.161	.244	.000	.055	.127	.405	.182	.588	.51	.19	.34
Eastern Samar	.061	.049	.000	.062	.114	.111	.176	.286	.28	.20	.23
Northern Samar	.116	.025	.000	.029	.053	.141	.082	.222	.45	.19	.30
Samar	.103	.027	.005	.019	.026	.136	.045	.180	.62	.22	.42
Region IX	.058	.080	.009	.024	.109	.147	.134	.281	.34	.16	.22
Basilan	.058	.057	.000	.026	.088	.125	.114	.239	.24	.17	.20
Sulu	.069	.099	.000	.002	.088	.168	.090	.258	.39	.15	.25
Tawi-Tawi	.076	.009	.000	.001	.056	.085	.056	.141	.34	.13	.21
Zamboanga del Norte	.048	.122	.012	.036	.126	.182	.161	.343	.33	.16	.22
Zamboanga del Sur	.060	.065	.012	.027	.118	.137	.145	.282	.35	.16	.22
Region X	.124	.069	.011	.027	.130	.204	.157	.361	.38	.16	.24
Agusan del Norte	.142	.065	.032	.032	.085	.239	.117	.357	.50	.18	.32
Agusan del Sur	.125	.031	.000	.016	.067	.156	.083	.239	.47	.15	.27
Bukidnon	.087	.088	.000	.016	.173	.175	.189	.364	.31	.14	.20
Camiguin	.259	.178	.000	.105	.210	.437	.315	.753	.33	.20	.26
Misamis Occidental	.105	.131	.031	.038	.170	.268	.207	.476	.31	.16	.22
Misamis Oriental	.189	.060	.019	.030	.194	.268	.224	.491	.46	.16	.25
Surigao del Norte	.147	.074	.011	.051	.096	.231	.148	.378	.35	.18	.26
Region XI	.080	.060	.015	.025	.116	.154	.142	.296	.32	.16	.22
Davao del Norte	.087	.084	.000	.030	.094	.171	.123	.294	.41	.17	.25
Davao del Sur	.077	.038	.034	.022	.127	.149	.149	.298	.37	.16	.22
Davao Oriental	.071	.088	.000	.015	.043	.159	.058	.217	.27	.17	.23
South Cotabato	.087	.048	.025	.030	.193	.160	.223	.383	.25	.15	.18
Surigao del Sur	.077	.062	.000	.030	.084	.139	.115	.253	.33	.18	.24
Region XII	.083	.039	.008	.023	.139	.131	.162	.293	.29	.16	.20
Lanao del Norte	.101	.047	.024	.043	.121	.171	.164	.335	.46	.17	.25
Lanao del Sur	.085	.039	.009	.019	.386	.132	.405	.538	.24	.15	.16
Maguindanao	.083	.009	.011	.012	.086	.102	.098	.200	.30	.16	.21
North Cotabato	.089	.039	.000	.035	.055	.128	.090	.218	.27	.19	.23
Sultan Kudarat	.058	.078	.000	.005	.120	.136	.126	.262	.23	.14	.18

Appendix 2–3

CLASSIFICATION OF PROVINCES

Classification of Provinces According to Socio-Economic Development
(using Incidence of Poverty as a Representative Indicator)

Rank 1)		Incidence of Poverty (%)
	(4) Cavite	31.4
	(1) Benguet	36.1
	(3) Pampanga	36.5
	(3) Bulacan	36.5
	(3) Zambales	38.3
	(4) Laguna	38.8
A	(1) La Union	42.8
	(3) Bataan	47.2
	(4) Rizal	49.7
	(4) Occidental Mindoro	51.6
	(10) Bukidnon	51.6
	(2) Isabela	51.7
	(4) Batangas	52.4
	(2) Nueva Vizcaya	52.4
	(1) Pangasinan	53.7
	(2) Quirino	53.7
	(1) Ilocos Norte	54.6
	(12) Sultan Kudarat	54.8
	(2) Cagayan	55.0
	(3) Nueva Ecija	55.1
	(12) Lanao del Sur	56.0
B	(3) Tarlac	56.2
	(1) Mountain Province	57.1
	(11) South Cotabato	57.1
	(11) Davao del Norte	59.9
	(2) Kalinga-Apayao	60.5
	(9) Zamboanga del Sur	60.9
	(1) Ilocos Sur	62.4
	(11) Davao del Sur	62.5
	(9) Sulu	63.0
	(10) Agusan del Norte	64.1
	(12) Lanao del Norte	65.3
	(9) Tawi-Tawi	66.0
	(7) Cebu	66.2
	(2) Ifugao	66.3
	(1) Abra	66.6
C	(11) Davao Oriental	66.8
	(11) Surigao del Sur	67.7
	(8) Leyte	68.0
	(6) Aklan	68.2
	(10) Misamis Oriental	68.3
	(12) Maguindanao	68.4
	(7) Negros Oriental	68.5
	(10) Agusan del Sur	68.7
	(5) Albay	68.8
	(6) Iloilo	69.4
	(5) Camarines Norte	69.6
	(8) Samar	69.6
	(8) Southern Leyte	69.9
	(4) Oriental Mindoro	70.5
	(9) Zamboanga del Norte	70.6
D	(5) Camarines Sur	71.5
	(10) Surigao del Norte	71.6
	(4) Palawan	72.0
	(5) Catanduanes	72.1
	(4) Quezon	72.5
	(6) Capiz	74.0
	(2) Batanes	74.2
	(12) North Cotabato	74.3
	(7) Bohol	74.8
	(8) Northern Samar	74.9
	(6) Negros Occidental	75.1
	(8) Eastern Samar	76.6
	(9) Basilan	78.4
	(10) Misamis Occidental	78.4
E	(5) Masbate	78.9
	(5) Sorsogon	79.5
	(6) Antique	80.1
	(4) Aurora	82.0
	(4) Marinduque	82.5
	(4) Romblon	83.0
	(7) Siquijor	86.9
	(10) Camiguin	88.3

Note 1) Rank A : First 14 Provinces
B : Second 15 Provinces
C : Third 15 Provinces
D : Fourth 15 Provinces
E : Last 14 Provinces

Classification of Provinces According to Adequacy of Road
(using Road Density , $L'/\sqrt{PA}$ as a Representative Indicator)

Rank 1)		Road Density $L'/\sqrt{PA}$
A	(2) Batanes	1.304
	(10) Camiguin	.783
	(7) Siquijor	.665
	(1) Ilocos Norte	.647
	(8) Southern Leyte	.588
	(4) Romblon	.585
	(3) Bataan	.564
	(12) Lanao del Sur	.538
	(7) Bohol	.535
	(1) Ilocos Sur	.527
	(4) Batangas	.525
	(4) Cavite	.509
	(3) Bulacan	.497
	(10) Misamis Oriental	.491
B	(1) Benguet	.485
	(2) Nueva Vizcaya	.481
	(4) Rizal	.479
	(10) Misamis Occidental	.476
	(1) Abra	.469
	(4) Laguna	.463
	(4) Marinduque	.452
	(1) La Union	.435
	(1) Pangasinan	.425
	(6) Iloilo	.422
	(3) Tarlac	.420
	(1) Mountain Province	.404
	(3) Pampanga	.394
	(8) Leyte	.386
	(5) Albay	.385
C	(11) South Cotabato	.383
	(10) Surigao del Norte	.378
	(5) Catanduanes	.378
	(5) Camarines Sur	.375
	(2) Ifugao	.370
	(6) Aklan	.364
	(10) Bukidnon	.364
	(3) Nueva Ecija	.359
	(10) Agusan del Norte	.357
	(6) Negros Occidental	.356
	(6) Capiz	.349
	(9) Zamboanga del Norte	.343
	(5) Sorsogon	.340
	(5) Camarines Norte	.338
	(12) Lanao del Norte	.335
D	(6) Antique	.334
	(7) Cebu	.333
	(2) Cagayan	.331
	(2) Quirino	.306
	(11) Davao del Sur	.298
	(11) Davao del Norte	.294
	(3) Zambales	.291
	(8) Eastern Samar	.286
	(4) Occidental Mindoro	.284
	(9) Zamboanga del Sur	.282
	(2) Isabela	.280
	(4) Oriental Mindoro	.263
	(12) Sultan Kudarat	.262
	(9) Sulu	.258
	(11) Surigao del Sur	.253
E	(7) Negros Oriental	.247
	(9) Basilan	.239
	(10) Agusan del Sur	.239
	(4) Aurora	.237
	(8) Northern Samar	.222
	(12) North Cotabato	.218
	(11) Davao Oriental	.217
	(4) Palawan	.214
	(4) Quezon	.213
	(2) Kalinga-Apayao	.212
	(12) Maguindanao	.200
	(8) Samar	.180
	(5) Masbate	.156
	(9) Tawi-Tawi	.141

Note 1) Rank A : First 14 Provinces
B : Second 15 Provinces
C : Third 15 Provinces,
D : Fourth 15 Provinces
E : Last 14 Provinces

Subclassification of Provinces According to Adequacy of Road by Class of Road

[SL]

- Primary and Secondary Roads: Relatively Poor
- Feeder Roads: Relatively Good

(1) Pangasinan
(4) Rizal
(1) Ilocos Sur
(1) Abra
(12) Lanao del Norte
(6) Antique
(11) South Cotabato
(12) Lanao del Sur
(8) Eastern Samar

[LL]

- Primary and Secondary Roads: Relatively Good
- Feeder Roads: Relatively Good

(2) Batanes
(10) Camiguin
(8) Southern Leyte
(1) Ilocos Norte
(4) Laguna
(4) Batangas
(7) Bohol
(4) Romblon
(10) Misamis Oriental
(3) Bulacan
(2) Nueva Vizcaya

[MM]

- Primary and Secondary Roads: Average
- Feeder Roads: Average

(10) Misamis Occidental
(5) Albay
(6) Iloilo
(10) Agusan del Norte
(8) Leyte
(3) Pampanga
(10) Surigao del Norte
(5) Camarines Sur
(3) Tarlac
(3) Nueva Ecija
(2) Ifugao
(6) Capiz
(7) Cebu
(6) Negros Occidental
(6) Aklan
(2) Cagayan
(9) Zamboanga del Norte
(10) Bukidnon

[SS]

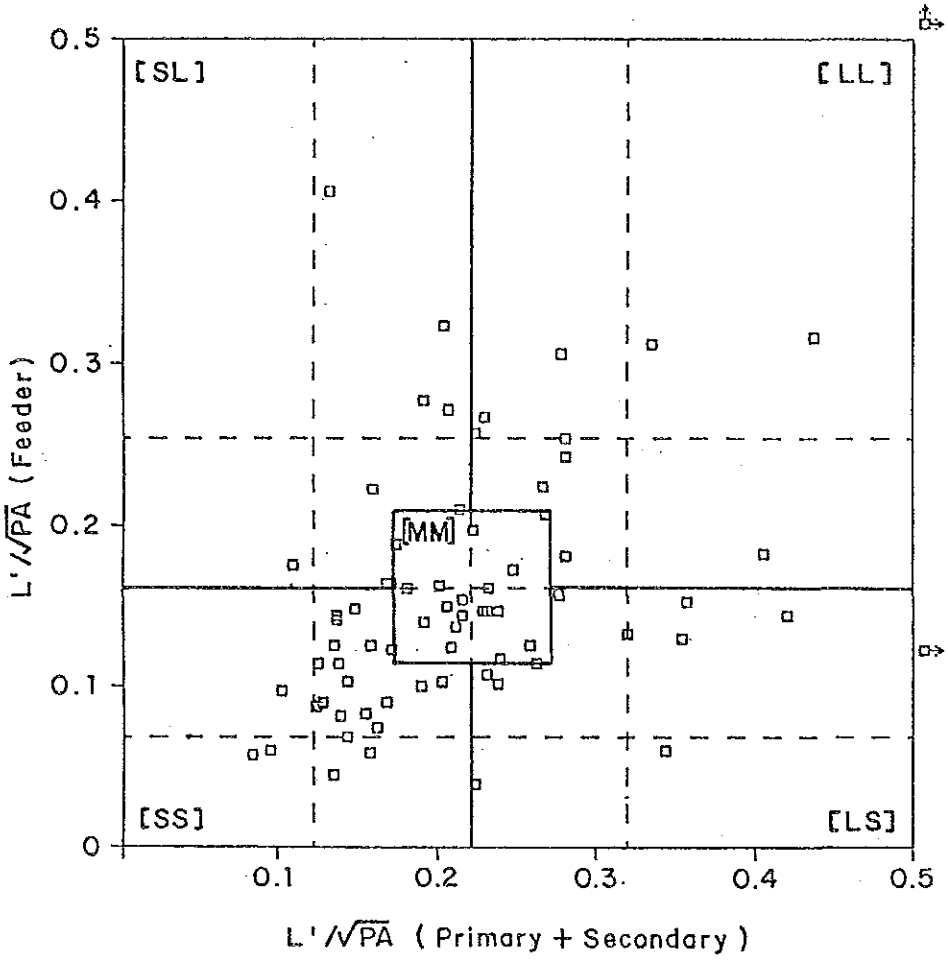
- Primary and Secondary Roads: Relatively Poor
- Feeder Roads: Relatively Poor

(2) Quirino
(3) Zambales
(11) Davao del Norte
(9) Sulu
(4) Aurora
(11) Davao Oriental
(4) Occidental Mindoro
(10) Agusan del Sur
(11) Davao del Sur
(4) Quezon
(7) Negros Oriental
(8) Northern Samar
(11) Surigao del Sur
(2) Isabela
(9) Zamboanga del Sur
(12) Sultan Kudarat
(8) Samar
(12) North Cotabato
(4) Palawan
(9) Basilan
(2) Kalinga-Apayao
(12) Maguindanao
(5) Masbate
(9) Tawi-Tawi

[LS]

- Primary and Secondary Roads: Relatively Good
- Feeder Roads: Relatively Poor

(7) Siquijor
(3) Bataan
(4) Cavite
(1) Benguet
(1) Mountain Province
(4) Marinduque
(1) La Union
(5) Catanduanes
(5) Sorsogon
(5) Camarines Norte
(4) Oriental Mindoro



Road Density by Class of Roads

Classification of Provinces According to
Geographical/Topographical Characteristics

Geographical/ Topographical Characteristics	Province
Inland Mountainous	(1) Abra
	(1) Benguet
	(1) Mountain Province
	(2) Ifugao
	(2) Kalinga-Apayao
	(2) Nueva Vizcaya
	(2) Quirino
	(10) Bukidnon
Inland Flat	(2) Isabela
	(3) Nueva Ecija
	(3) Tarlac
	(10) Agusan del Sur
	(12) North Cotabato
Seaside Mountainous	(1) Ilocos Norte
	(1) Ilocos Sur
	(1) La Union
	(3) Bataan
	(3) Zambales
	(4) Aurora
	(4) Occidental Mindoro
	(4) Oriental Mindoro
	(4) Quezon
	(5) Camarines Norte
	(6) Aklan
	(6) Antique
	(7) Negros Oriental
	(8) Southern Leyte
	(8) Eastern Samar
	(8) Northern Samar
	(8) Samar
	(9) Zamboanga del Norte
	(9) Zamboanga del Sur
	(10) Agusan del Norte
	(10) Misamis Occidental
	(10) Misamis Oriental
	(10) Surigao del Norte
	(11) Davao del Sur
	(11) Davao Oriental
	(11) South Cotabato
	(11) Surigao del Sur
	(12) Lanao del Norte
	(12) Lanao del Sur
	(12) Sultan Kudarat
Seaside Flat	(1) Pangasinan
	(2) Cagayan
	(3) Bulacan
	(3) Pampanga
	(4) Batangas
	(4) Cavite
	(4) Laguna
	(4) Rizal
	(5) Albay
	(5) Camarines Sur
	(5) Sorsogon
	(6) Capiz
	(6) Iloilo
	(6) Negros Occidental
	(8) Leyte
	(11) Davao del Norte
	(12) Maguindanao
Island Round	(2) Batanes
	(4) Marinduque
	(4) Romblon
	(5) Catanduanes
	(7) Bohol
	(7) Siquijor
	(9) Basilan
	(9) Sulu
	(10) Camiguin
Island Narrow	(4) Palawan
	(5) Masbate
	(7) Cebu
	(9) Tawi-Tawi

Appendix 2–4

ON–GOING/COMMITTED PROJECTS

ON-GOING/COMMITTED RURAL ROAD PROJECTS

- DPWH SUMMARY AND NATIONAL TOTAL -

	4th UNDP F/S	5th UNDP F/S	F/S of Roads in Visayas and Mindanao	Palawan Integrated Area Development Project	Highland Agricultural Development Project	Samar Integrated Area Development Project	9 Rural Infrastructure Fund	Sorsogon Integrated Area Development	Bicol Secondary and Feeder Road Project	Access Roads Improvement Along Rosario-Laoag - Allacapan Section	Tarlac Rural Roads Development Project	SUB-TOTAL (DPWH)	SUB-TOTAL (DLG)	TOTAL	Excluded from Candidate Provinces
Region I															
Abra													26	26	
Benguet					133							133	15	148	●
Ilocos Norte										150		150	50	200	●
Ilocos Sur										173		173	27	200	●
La Union										74		74		74	
Mt. Province					80							80	4	84	
Pangasinan	34		85									119	(TBI)	(TBI) 119	
Region II															
Batanes															▲
Cagayan	63		172							112		347	69	416	●
Ifugao													94	94	
Isabela	60		75									135	196	331	●
Kalinga-Apayao													6	6	
Nueva Vizcaya	33											33	83	116	
Quirino													86	86	
Region III															
Bataan															
Bulacan															
Nueva Ecija															
Pampanga															
Tarlac											190	190	39	229	●
Zambales			45									45	104	149	●
Region IV															
Aurora													56	56	
Batangas			154									154		154	●
Cavite			4									4	(TBI)+6	TBI 10	○
Laguna		109										109		109	
Marinduque		97										97	9	106	●
Occidental Mindoro															
Oriental Mindoro													(TBI)+14	TBI 14	
Palawan			90	276								366	39	405	●
Quezon			155				28					183	194	377	●
Rizal															
Roublon		127										127		127	
Region V															
Albay															
Camarines Norte													34	34	
Camarines Sur			45				29.5		468			542.5		542.5	●
Catanduanes			204									204	69	273	
Masbate		101						131				101	(TBI)	101 TBI	○
Sorsogon												131		131	●

Legend:
- ●: Province with road projects of more than 150 kms.
- ▲: Remote and small island province
- ○: Province selected in the Phase I Study

- DPWH SUMMARY AND NATIONAL TOTAL -

	4th UNDP F/S	5th UNDP F/S	F/S of Roads in Luzon, Visayas, and Mindanao	Palawan Integrated Area Development Project	Highland Agricultural Development Project	Samar Integrated Area Development Project	* Rural Infra-Structure Fund	* Sorsogon Integrated Area Development	Bicol Secondary and Feeder Road Project	Access Roads Improvement Along Rosario-Lacag - Allacapan Section	Yarlac Rural Roads Project	SUB-TOTAL (DPWH)	SUB-TOTAL (DLG)	TOTAL	Excluded from Candidate Provinces
Region VI															
Aklan	39						57.5					96.5	83	179.5	●
Antique			21									21	58	79	
Capiz													53	53	
Iloilo	94		46				41					140	326	466	●
Negros Occidental	105		26									131	137	268	●
Region VII															
Bohol			71									71	25	96	○
Cebu		132	20									152	131	283	●
Negros Oriental	106											106	188	294	●
Siquijor															▲
Region VIII															
Leyte			67									67		67	
Southern Leyte			42									42	12	54	
Eastern Samar						346						346		346	●
Northern Samar						226						226		226	●
Samar						44						46	64	110	
Region IX															
Basilan															▲
Sulu															▲
Tawi-tawi													(TBI)	(TBI)	▲
Zamboanga del Norte			105									105	85	190	●
Zamboanga del Sur		422	149									571		571	●
Region X															
Agusan del Norte													37	37	○
Agusan del Sur													111	111	
Bukidnon	110	32	196									338		338	●
Camiguin															▲
Misamis Occidental													65	65	
Misamis Oriental		30	64									94	(TBI)	94 TBI	
Surigao del Norte													14	14	
Region XI															
Davao del Norte			135									135		135	
Davao del Sur	240		65									305	90	395	●
Davao Oriental	87											87	(TBI) 12	99	
South Cotabato													20	20	
Surigao del Sur													19	19	
Region XII															
Lanao del Norte															
Lanao del Sur			36									36		36	
Maguindanao													(TBI)	(TBI)	
North Cotabato	37		115									152		152	●
Sultan Kudarat			212									212		212	●

- DLG SUMMARY -

	Rural Roads Improvement Project (RRIP), IBRD 1985 - Present As of May 1989 97% completed (Lone No. 1860-PH)	Second Rural Roads Improv. Project (SRRIP), IBRD 1987-Present Completion June 1992 (Lone No. 2716-PH)	Third Road Improvement Project (TRIP), ADB 1983-Present Completion 1990	Fourth Road Improv. Project (FRIP), ADB 1987-Present Completion Nov. 1989 Detailed Design	Upland Access Project (UAP) USAID Completion Sept. 1989 (?)	Projects of Department of Local Government -TOTAL- DLG TOTAL
Region I						
Abra		15.3			11	26
Benguet					15	15
Ilocos Norte		50.1				50
Ilocos Sur	27.1					27
La Union						
Mt. Province					4	4
Pangasinan		TBI				TBI
Region II						
Batanes						
Cagayan		69.3				69
Ifugao			44	50		94
Isabela				196		196
Kalinga-Apayao					6	6
Nueva Vizcaya			15	68		83
Quirino			74	12		86
Region III						
Bataan						
Bulacan						
Nueva Ecija						
Pampanga						
Tarlac				39		39
Zambales			62	14	28	104
Region IV						
Aurora			56			56
Batangas						
Cavite		TBI			6	(TBI) + 6
Laguna						
Marinduque		3.6				9
Occidental Mindoro						
Oriental Mindoro		TBI			14	(TBI) + 14
Palawan			35		4	39
Quezon	194					194
Rizal						
Romblon						
Region V						
Albay						
Camarines Norte	33.6					34
Camarines Sur						
Catanduanes		69.3				69
Masbate		TBI				(TBI)
Sorsogon						

TBI: To be identified

- DLG SUMMARY -

	Rural Roads Improvement Project (RRIP), IBRD 1985 - Present As of May 1989 97% completed (Lone No. 1860-PH)	Second Rural Roads Improv. Project (SRRIP), IBRD 1987-Present Completion June 1992 (Lone No. 2716-PH)	Third Road Improvement Project (TRIP), ADB 1983-Present Completion 1990	Fourth Road Improv. Project (FRIP), ADB 1987-Present Completion Nov. 1989 Detailed Design	Upland Access Project (UAP) USAID Completion Sept. 1989 (?)	Projects of Department of Local Government -TOTAL- DLG TOTAL
Region VI						
Aklan	75				8	83
Antique			21	37		58
Capiz				53		53
Iloilo	326					326
Negros Occidental			78	50	9	137
Region VII						
Bohol		24.5				25
Cebu	113.6				17	131
Negros Oriental			125	63		188
Siquijor						
Region VIII						
Leyte						
Southern Leyte		11.5				12
Eastern Samar						
Northern Samar						
Samar		63.9				64
Region IX						
Basilan		-				
Sulu						
Tawi-tawi		TBI				(TBI)
Zamboanga del Norte				63	22	85
Zamboanga del Sur						
Region X						
Agusan del Norte		37.3				37
Agusan del Sur		111.1				111
Bukidnon						
Camiguin						
Misamis Occidental				65		65
Misamis Oriental		TBI				(TBI)
Surigao del Norte		13.5				14
Region XI						
Davao del Norte						
Davao del Sur		90.1				90
Davao Oriental		TBI			12	(TBI) + 12
South Cotabato					20	20
Surigao del Sur		18.5				19
Region XII						
Lanao del Norte						
Lanao del Sur						
Maguindanao		TBI				(TBI)
North Cotabato						
Sultan Kudarat						

TBI: To be identified

Appendix 3–1

MINOR ROAD PRE–EVALUATION INDICATOR (MPI)

1. INTRODUCTION

Ojectives of Stage - 2 are:

i) to identify road projects
ii) to evaluate and screen identified road projects, and
iii) to select road projects for feasibility studies.

At this Stage, data collected for each road project is limited. This is particularly true for minor roads, because the studied roads were mostly these which were proposed by the local officials and data of each project were collected by interviewing local officials. One of the most important data to evaluate minor roads is cultivated area within the road influence area which, however, is not available at this Stage. Under such conditions, minor road projects must be roughly evaluated and screened.

The Study Team developed "Minor Road Pre-evaluation Indicator (MPI)" based on the Phase I Study. To be noted are:

a) MPI is developed to select all possibly feasible projects without fail. Thus, selected projects includes possibly unfeasible projects.

b) MPI is not used for the simplified evaluation method. More detailed analysis will be made to develop the simplified evaluation method in Stage-3.

2. DEVELOPMENT OF MPI

2-1. Analysis Method used to develop MPI

Method : Quantification Theory, Class 1
Criterion Variables : IRR
Predictor Variables :
- Surface Condition
- Terrain
- Population within road influence area (RIA)
- Link Value (population in RIA per km. of a road

Data used : Minor roads evaluation results conducted in Phase I Study (Provinces Cavite, Masbate, Bohol and Agusan del Norte)

2-2. Computation of MPI

1) Categorization of Predictor Variables

Categorization of predictor variablles is shown in Table - A

Table - A Categorization

Item	Category
a. Surface Condition	1. Good/Fair 2. Bad 3. Very Bad 4. Impassable
b. Terrain	1. Flat 2. Rolling 3. Mountainous
c. Population within RIA	1. 0 - 500 2. 501 - 1,000 3. 1,001 - 2,000 4. 2,001 - 4,000 5. 4,001 -
d. Link Value	1. 0 - 200 2. 201 - 400 3. 401 - 600 4. 600 - 1,000 5. 1,001 -

2) Formula

$$MPI = 6.747 + fa + fb + fc + fd$$

where : MPI = Minor road pre-evaluation indicator
fa, fb, fc, fd = category score for each category of items a, b, c and d. (Refer to Table-B)

Table - B Category Score

Item	Category Score				
	1	2	3	4	5
a. Surface Condition	-4.494	-1.181	0.883	2.551	-
b. Terrian	-1.551	0.289	2.103	-	-
c. Population	-2.611	-1.713	0.278	1.959	2.805
d. LInk Value	-2.701	-1.713	0.417	0.502	5.530

2-3 Screening of minor raod projects by MPI

1) Sceening Criteria by MPI

MPI< 7.5 : Possibility of the project being feasible is minimal.

MPI> 7.5 : Possibility of the project being feasible is high.

2) Verification of sreening by MPI

Relation between IRR and MPI computed by the proposed formula is shown in Figure-A and summarized in Table-C.

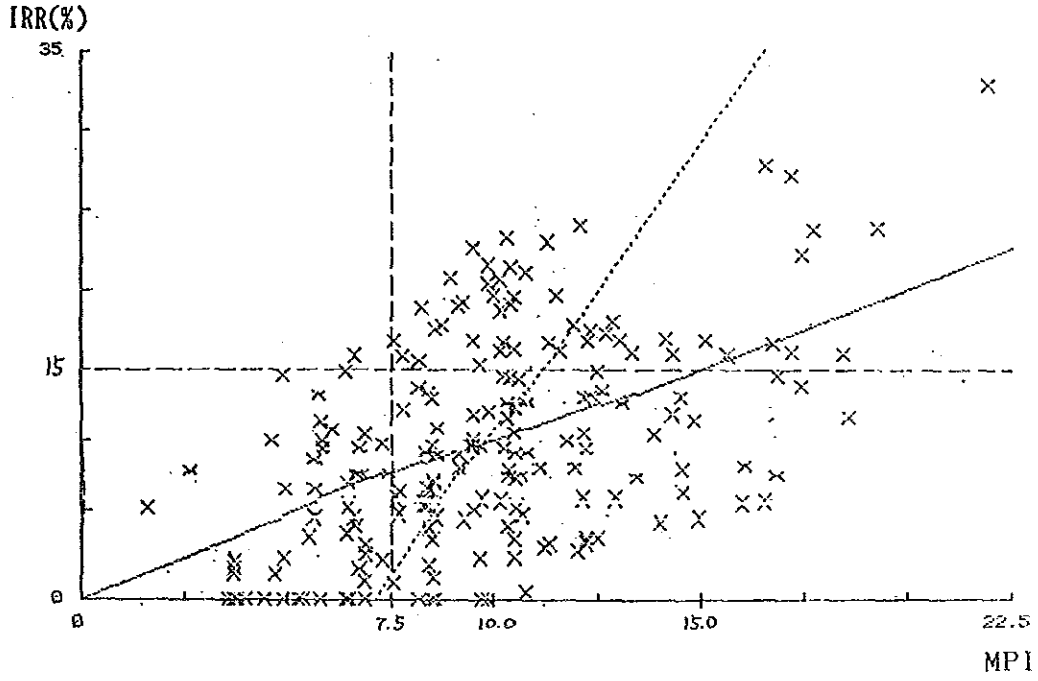


Figure A

Table-C IRR VS. MPI

	Unfeasible	Feasible
	IRR< 15%	IRR> 15 %
MPI < 7.5	53 projects	1 projects
MPI > 7.5	101 projects	58 projects
Total	154 projects	59 projects

When minor road projects of which MPI is 7.5 or more, are selected, possibility to fail to select feasible projects will be less than 2%. In other words, almost all feasible projects will be selected as shown in Table-C (58 out of 59 feasible projects are selected).

2-4 Interpretation of Category Score

Mean value and Standard deviation of benefit, cost and economic internal rate of return (EIRR) under each category are shown in Table-D.

Category score will be interpreted as follows :

1)Surface Condition

The worse a road surface condition is, the higher development potential is, thus the more development benefits are derived, resulting in high EIRR.

With reagrds to traffic benefits and cost, the worse a road surface condition is, the more traffic benefits and the higher cost are generally expected, however, these trends are not shown in Table-D. This is becuase the worse a road surface condition was, the lesser traffic volume was and accordingly the lower type of improvement was proposed.

2)Terrain

Constraints for developement are higher in the order of mountainous, rolling and flat, thus development benefits and EIRR are also higher in the same order. Costs are generally high in the same order, however, Table-D shows different tendency. This is because lower type of improvement was proposed in line with lower traffic volume in mountainous area.

3)Population within the road influence area (RIA)

The more population within RIA is, the more traffic is generated, thus the more traffic benefits are derived, resulting in higher EIRR. With an increase of traffic volume, the higher type of improvement is required resulting in higher costs, however this tendency is not so influential to EIRR.

No correlation between population within RIA and development benefits is observed.

8)Link Value

The same tendency as 3) above is observed.

Table - D

Mean Value and Standard Deviation of Benefit/Cost/EIRR of Road Projects under each Category

(Cost/Benefit : Discounted Total during the Analysis Period)

Item	Category	Score	No. of Data	Traffic Benefit (MP/km)		Development Benefit (MP/km)		Total Benefit (MP/km)		Cost (MP/km)		EIRR (%)	
				Ave.	S.D.	Ave.	S.D.	Ave.	S.D.	Ave.	S.D.	Ave.	S.D.
Surface Condition	1. Good/Fair	-4.494	7	.351	.284	.051	.054	.402	.293	.506	.206	8.7	7.3
	2. Bad	-1.181	97	.408	.422	.169	.076	.577	.435	.681	.337	9.2	7.9
	3. Very Bad	0.883	78	.379	.260	.241	.169	.620	.342	.626	.303	11.9	8.2
	4. Impassable	2.551	31	.281	.165	.346	.197	.627	.289	.554	.064	11.8	7.2
Terrain	1. Flat	-1.551	74	.340	.326	.159	.093	.500	.334	.603	.252	9.0	8.2
	2. Rolling	0.289	96	.395	.365	.241	.171	.636	.417	.662	.329	11.0	8.2
	3. Mountainous	2.103	43	.400	.287	.264	.164	.664	.340	.638	.303	12.4	6.9
Population	1. - 500	-2.611	26	.141	.104	.216	.176	.357	.262	.477	.073	6.3	5.7
	2. 501-1,000	-1.713	57	.226	.169	.210	.135	.435	.240	.554	.198	8.0	7.1
	3. 1,001-2,000	0.278	57	.348	.284	.218	.129	.565	.311	.581	.193	11.1	7.2
	4. 2,001-4,000	1.959	45	.520	.309	.217	.162	.737	.355	.733	.297	13.0	8.6
	5. 4,001-	2.805	28	.732	.474	.235	.190	.967	.499	.913	.496	15.0	8.7
Link Value	1. - 200	-2.701	24	.201	.153	.216	.200	.418	.302	.507	.085	7.6	6.9
	2. 201- 400	-0.730	70	.310	.247	.239	.146	.549	.305	.606	.226	9.6	6.6
	3. 401- 600	-0.417	54	.356	.327	.204	.129	.560	.370	.634	.244	9.6	7.3
	4. 601-1,000	0.502	38	.437	.288	.205	.115	.641	.308	.730	.423	11.3	7.9
	5. 1,001-	5.530	27	.663	.514	.207	.199	.870	.551	.706	.406	16.7	10.4

2.5 OTHER REFERENCES

In Phase I Study, a link value (popualtion within RIA per km. of a road) was used for screening minor road projects, then selected projects were subjected to the detailed feasibility study. Correlation between Link Values and IRRs was analized utilizing results of feasibility studies. Also, correlation between population within RIA and IRRs was examined. Results of analysis are shown below :

1) Correlation between Link Value (LV) and IRR

Province	Regression Model	No. of Samples	Correlation Coefficient
Cavite	IRR = 8.31 + 0.0037.LV	98	0.243
Masbate	IRR = 8.68 + 0.0077.LV	28	0.363
Bohol	IRR =11.76 + 0.0017.LV	48	0.052
Agusan del Norte	IRR = 1.98 + 0.0061.LV	37	0.481
Four Provinces	IRR = 8.00 + 0.0046.LV	211	0.259

As shown above, no correlation between Link Value and IRR was observed.

2) Correlation between Population within RIA and IRR

Province	Regression Model	No. of Data	Correlation Coefficient
Cavite	IRR = 8.94 + 0.00088.P	98	0.190
Masbate	IRR = 8.18 + 0.00195.P	28	0.549
Bohol	IRR = 9.11 + 0.00166.P	48	0.355
Agusan del Norte	IRR = 2.13 + 0.00166.P	37	0.587
Four Provinces	IRR = 7.59 + 0.00151.P	211	0.364

As shown above, no correlation between Population within RIA and IRR was observed.

Appendix 7–1

DEFINITION OF DISTRESS

APPENDIX 7 - 1

DEFINITION OF DISTRESS

A. Gravel Surfaced Road

(1) Surface Distress

1) Surface Cracks

They are hairline cracks, line cracks, and fine alligator cracks occuring locally and usually having a width of about 2 mm. Mostly these cracks occur as shrinkage cracks in dry climatic condition where surplus amount of silt-clay fines exist in gravel layer.

2) Deformation

a. Rutting

Rutting is the uneven surface condition in the transverse direction of the roads.

b. Longitudinal Unevenness

Longitudinal unevenness is the uneven surface condition in the longitudinal direction of the roads.

c. Corrugation

Corrugation is the uneven surface condition consisting of alternate crest and valley at close, regular intervals in the longitudinal direction of the roads.

Rutting, longitudinal unevenness and corrugation are mainly due to regular and irregular loss of aggregates in surface layer caused by ravelling and shear action of wheels.

3) Potholes

Potholes are bowl-shaped holes usually caused by weak surface layer materials.

The severity of abrasion and potholes are dependent on the materials quality (gravel, sand and silt-clay fines composition, and bearing strength), climate and traffic conditions.

(2) *Structural Distress*

1) Alligator Cracks

They are interconnected cracks like an alligator's skin caused by subgrade weakness, and is accompanied by depression of the surface.

2) Depressions

Depressions are road surface settlement and distortion caused by consolidation of weak subgrade.

B. BITUMINOUS PAVEMENT

(1) *Surface Distress*

1) Cracks

a. Transverse and Longitudinal Cracks

These cracks run either across the pavement in the direction of length, which were caused by base movement or subgrade movement, pavement shrinkage or by swelling of certain type of soils.

b. Shrinkage Cracks

They are interconnected cracks forming a series of polygon, usually with sharp corners or angles. Shrinkage cracks are caused by faults in the pavement mixtures, such as volume change from drying out, low asphalt content.

2) Deformations

a. Rutting

Rutting is the uneven pavement surface conditions in the transverse direction of the roads.

b. Longitudinal Unevenness

Longitudinal unevenness is the uneven pavement surface condition in the longitudinal direction on the roads.

c. Corrugations

Corrugations are undulations consisting of alternate crests and valleys at close, regular interval in the pavement.

Rutting, longitudinal unevenness and corrugations are caused by lack of stability in the surface layer. Excess or lean asphalt binder, improper aggregate size and gradation, and abrasion of pavement surface contributed to the uneven surface.

3) Abrasion

Abrasion is the progressive separation of aggregate particles in a pavement from the surface downward or from the edge inward. It may be caused by wear and tear of wheel action, by too little asphalt binder mixture. Loss of adhesion of asphalt binder to aggregate due to insufficient amount of binder film, or contaminated aggregate presence.

4) Potholes

Potholes are bowl-shaped holes usually caused by weak surface mixture or insufficient amount of asphalt binder sprayed surface course. Local abrasion is also the cause of potholes.

5) Bleeding

Bleeding is a film of asphalt binder on the pavement surface which creates a shiny, glass-like, reflecting surface that usually becomes sticky. Bleeding is caused by excessive amount of asphalt binder in the mix or binder sprayed layer.

(2) *Structural Distress*

1) Alligator Cracks

Alligator cracks are interconnected cracks forming a series of small polygons resembling an alligator's skin in most cases, alligator cracking is caused by unstable support due to base of subgrade weakness, and accompanied by depression of the surface.

2) Depressions

Depressions are road surface settlements and distortions caused by consolidation of weak base and subgrade. Depression may or may not be accompanied by cracking, but in either instance they usually created a low area.

Appendix 7–2

BENKELMAN BEAM DEFLECTION MEASUREMENT RESULTS

BENKELMAN BEAM DEFLECTION MEASUREMENT RESULTS
FOR SELECTED EACH PAVEMENT SECTION

Measurement No.		1	2	3	
Pavement	Type	GR	GR	GR	
	Surface Condition	Good to Fair	Good to Fair	Bad	
B.B. Deflection Value	Survey length	50 m.	50 m.	50 m.	
	n	12	12	24	
	Max. 0.01 mm	138	138	218	
	Min. 0.01 mm	56	76	76	
	x 0.01 mm	86.0	111.2	131.5	
	σ 0.01 mm	21.6	25.6	36.2	
	v %	25.2	22.8	27.5	
Pavement survey Road Section		Provincial Road Hagallanes to Maragondon (Experimental Pavement Construction Section No. 2)		Provincial Road Alfonso to Hagallanes (Experimental Pavement Construction Section No. 1)	
10 m. interval at IWP and OWP on both direction		0+300 to 0+350	0+350 to 0+400	0+400 to 0+450	

BENKELMAN BEAM DEFLECTION MEASUREMENT RESULTS
FOR SELECTED EACH PAVEMENT SECTION

Measurement No.		4	5	6	7
Pavement	Type	DBST	DBST	DBST	DBST
	Surface	Good	Good	Good to fair	Good to fair
B.B. Deflection Value	Survey length	50 m.	50 m.	50 m.	
	n	24	24	24	
	Max. 0.01 mm	126	86	138	118
	Min. 0.01 mm	38	54	70	60
	x 0.01 mm	63.6	74.1	84.6	83.3
	σ 0.01 mm	23.5	7.2	17.5	13.8
	v %	36.9	9.7	20.1	16.6
Pavement survey Road Section		Provincial Road Alfonso to Gen. Aguinaldo		Provincial Road Gen. Trias to Amadeo (Experimental Pavement Construction Section No. 3)	
10 m. interval at IWP and OWP on both direction		0+150 to 0+200	0+250 to 0+300	0+100 to 0+150	0+150 to 0+200

BENKELMAN BEAM DEFLECTION MEASUREMENT RESULTS
FOR SELECTED EACH PAVEMENT SECTION

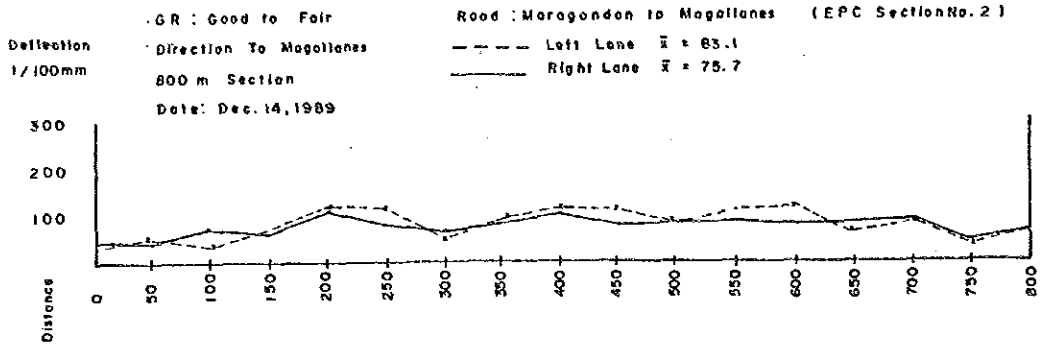
Measurement No.		8	9		
Pavement	Type	DBST	DBST		
	Surface Condition	Bad	Bad		
B.B. Deflection Value	Survey length	50 m.	50 m.		
	n	24	24		
	Max. 0.01 mm	208	204		
	Min. 0.01 mm	152	150		
	x 0.01 mm	179.8	162.4		
	σ 0.01 mm	16.8	31.5		
	v %	9.3	19.4		
Pavement survey Road Section		Provincial Road Gen. Trias to Amadeo (Experimental Pavement Construction Section No. 4)			
10 m. interval at LWP and OWP on both direction		0+350 to 0+400	0+400 to 0+450		

BENKELMAN BEAM DEFLECTION MEASUREMENT RESULTS
FOR SELECTED EACH PAVEMENT SECTION

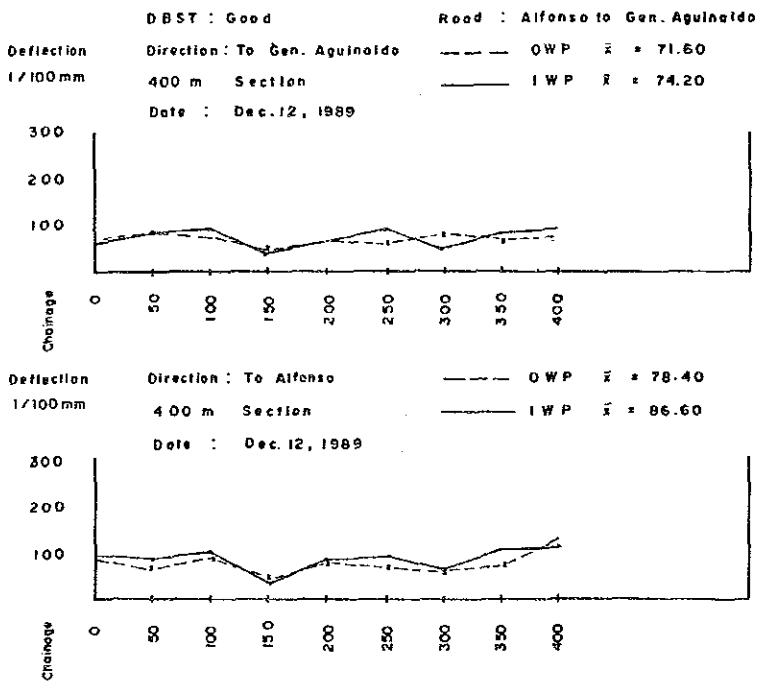
Measurement No.		10	11	12	
Pavement	Type	BHP	BPM	BHP	
	Surface Condition	Fair to Bad	Fair to Bad	Bad	
B.B. Deflection Value	Survey length	50 m.	50 m.	50 m.	
	n	24	24	24	
	Max. 0.01 mm	242	272	308	
	Min. 0.01 mm	78	78	180	
	x 0.01 mm	138.3	130.8	233.3	
	σ 0.01 mm	47.3	44.2	34.5	
	v %	34.2	33.8	14.8	
Pavement survey Road Section		Tagaytay to Mendez			
10 m. interval at LWP and OWP on both direction		0+950 to 1+ 00	1+ 00 to 1+ 50	0+250 to 0+300	

BENKELMAN BEAM DEFLECTION MEASUREMENT RESULTS
FOR SELECTED EACH PAVEMENT SECTION

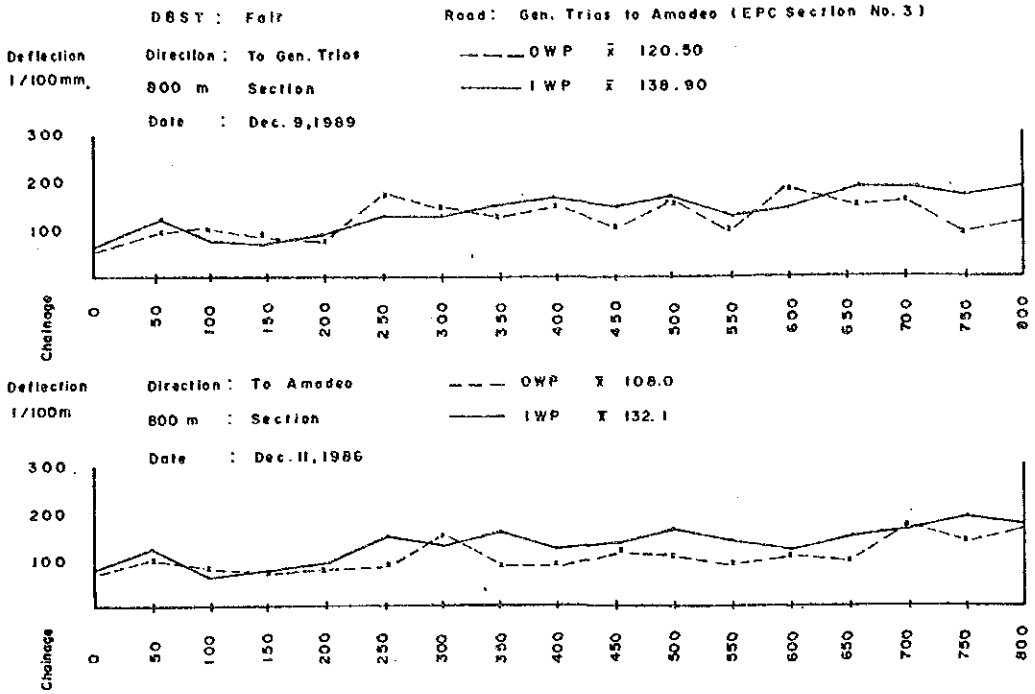
Measurement No.		13	14	15	
Pavement	Type	AC	AC	AC	
	Surface Condition	Very Good	Fair to Bad	Fairto Bad	
B.B. Deflection Value	Survey length	50 m.	50 m.	50 m.	
	n	24	24	24	
	Max. 0.01 mm	106	142	196	
	Min. 0.01 mm	52	94	72	
	x 0.01 mm	74.5	113.5	124.8	
	σ 0.01 mm	14.9	19.3	36.5	
	v %	19.9	17.0	29.2	
Pavement survey Road Section		National Rd. Ternate to Pueruto Azul	National Road Trece Martirez to G. M. Alverez		
10 m. interval at IWP and OWP on both direction		0+00 to 0+ 50	0+ 50 to 0+100	0+350 to 0+400	



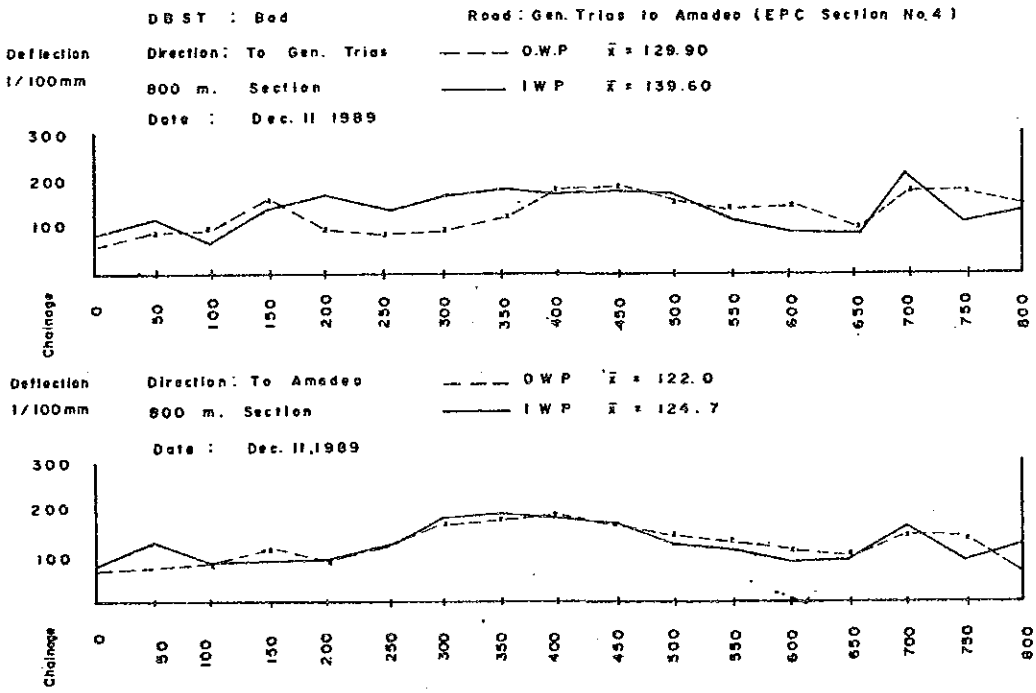
Benkelman Beam Deflection Profile No. 1



Benkelman Beam Deflection Profile No. 2



Benkelman Beam Deflection Profile No.3



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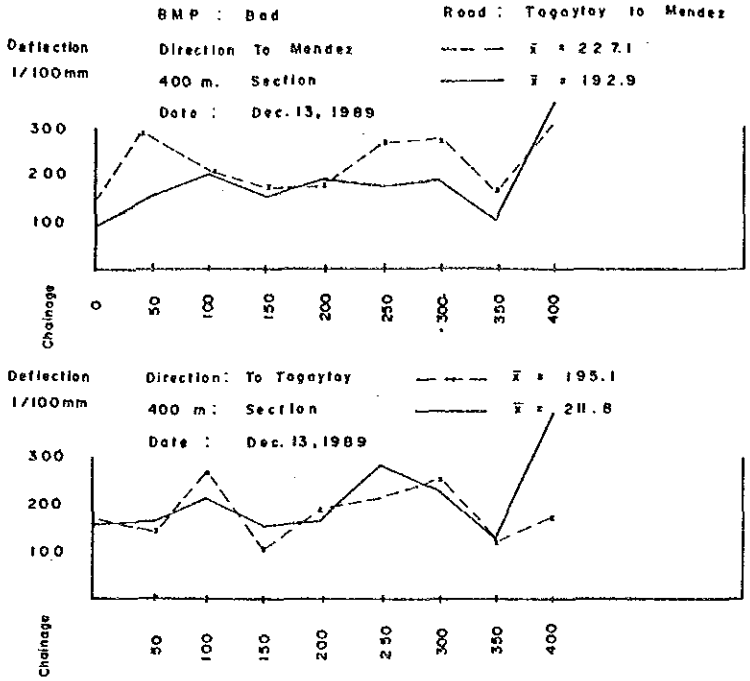
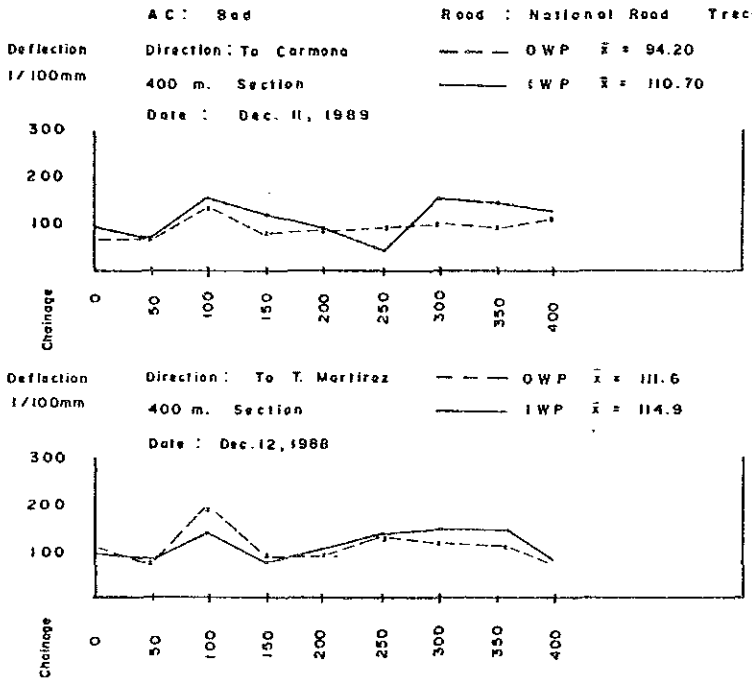


Benkelman Beam Deflection Profile No.5



Benkelman Beam Deflection Profile No.6

Appendix 7–3

PAVEMENT CONDITION AND DISTRESS MEASUREMENT RESULTS

PAVEMENT CONDITION AND DISTRESS MEASURMENT RECORD No. 1 Date Dec. 20, 89

Pavement Type : (GR) DBST, BMP, AC
Location: Road Magallanes to Maragondon (EPC Section No.1)
Survey Chainage : 0+300 ~ 0+350.

Pavement Condition Rating : VG, (G) (F) B, VB
Survey Length : 50 m. Pavement Width 6.0 m.
Survey Area : 300 m2

Type of Distress	Right Lane		Left Lane		Total	
	Area (m2)	%	Area (m2)	%	Area (m2)	%
Cracks						
Potholes						
Patching						
Abrasion						
Deformation						
Depression	12.0	8.0	15.8	10.5	25.8	8.6
Others						
Total						

longitudinal Roughness	Right Lane	Left Lane	Remarks
$\bar{X}$ mm	13.3	12.2	3 m. Straight Edge Measurement Method
σ mm	5.9	4.4	

PAVEMENT CONDITION AND DISTRESS MEASURMENT RECORD No. 2 Date Dec. 20, 89

Pavement Type : (GR) DBST, BMP, AC
Location: Road Magallanes to Maragondon (EPC Section No.1)
Survey Chainage : 0+350 - 0+400

Pavement Condition Rating : VG, (G) (F) B, VB
Survey Length : 50 m. Pavement Width 6.0 m.
Survey Area : 300 m2

Type of Distress	Right Lane		Left Lane		Total	
	Area (m2)	%	Area (m2)	%	Area (m2)	%
Cracks						
Potholes						
Patching						
Abrasion						
Deformation						
Depression	10.7	7.1	16.3	10.9	27.0	9.0
Others						
Total						

longitudinal Roughness	Right Lane	Left Lane	Remarks
$\bar{X}$ mm	15.5	15.9	3 m. Straight Edge Measurement Method
σ mm	9.7	9.0	

PAVEMENT CONDITION AND DISTRESS MEASURMENT RECORD No. 3 Date Dec. 20, 89

Pavement Type : (GR) DBST, BMP, AC
Location: Road Alfonso to Magallanes (EPC Section No.1)
Survey Chainage : 0+400 - 0+450

Pavement Condition Rating : VG, G, F, (B) VB
Survey Length : 50 m. Pavement Width 6.0 m.
Survey Area : 300 m2

Type of Distress	Right Lane		Left Lane		Total	
	Area (m2)	%	Area (m2)	%	Area (m2)	%
Cracks						
Potholes						
Patching						
Abrasion						
Deformation	41.4	27.6	67.6	100.9	100.9	33.6
Depression	76.8	51.2	45.0	30.3	121.8	40.3
Others						
Total						

Longitudinal Roughness	Right Lane	Left Lane	Remarks
$\bar{x}$ mm	22.8	24.4	3 m. Straight Edge Measurement Method
σ mm	13.7	14.1	

PAVEMENT CONDITION AND DISTRESS MEASURMENT RECORD No. 4 Date Dec. 19, 89

Pavement Type : GR, (DBST) BMP, AC
Location: Road Alfonso to Gen. Aguinaldo
Survey Chainage : 0+150 - 0+200

Pavement Condition Rating : VG, (G) F, B, VB
Survey Length : 50 m. Pavement Width 6.0 m.
Survey Area : 300 m2

Type of Distress	Right Lane		Left Lane		Total	
	Area (m2)	%	Area (m2)	%	Area (m2)	%
Cracks						
Potholes						
Patching						
Abrasion *	10.2	6.8	6.7	4.7		5.6
Deformation						
Depression						
Others						
Total						

* Streaking

Longitudinal Roughness	Right Lane	Left Lane	Remarks
$\bar{x}$ mm	6.6	4.9	3 m. Straight Edge Measurement Method
σ mm	2.9	1.9	

PAVEMENT CONDITION AND DISTRESS MEASURMENT RECORD No. 5 Date Dec. 19, 89

Pavement Type : GR, (DBST) BMP, AC
Location: Road Alfonso to Gen. Aguinaldo
Survey Chainage : 0+250 - 0+300

Pavement Condition Rating : VG, (G) F, B, VB
Survey Length : 50 m. Pavement Width 6.0 m.
Survey Area : 300 m2

Type of Distress	Right Lane		Left Lane		Total	
	Area (m2)	%	Area (m2)	%	Area (m2)	%
Cracks						
Potholes						
Patching						
Abrasion *	27.3	18.2	10.2	6.8	37.5	12.5
Deformation						
Depression						
Others						
Total						

* Streaking

Longitudinal Roughness	Right Lane	Left Lane	Remarks
$\bar{x}$ mm	6.2	5.6	3 m. Straight Edge Measurement Method
σ mm	1.4	1.7	

PAVEMENT CONDITION AND DISTRESS MEASURMENT RECORD No. 6 Date Dec. 15, 89

Pavement Type : GR, (DBST) BMP, AC
Location: Road Gen. Trias to Amadeo (EPC Section No.3)
Survey Chainage : 0+100 - 0+150

Pavement Condition Rating : VG, G, (F) (B) VB
Survey Length : 50 m. Pavement Width 6.0 m.
Survey Area : 300 m2

Type of Distress	Right Lane		Left Lane		Total	
	Area (m2)	%	Area (m2)	%	Area (m2)	%
Cracks	25.8	17.2	39.6	28.4	65.4	21.9
Potholes	0.6	0.4	0	0	0.6	0.2
Patching						
Abrasion *	19.5	13.0	0	0	19.5	6.5
Deformation						
Depression						
Others						
Total						

* Streaking and ravelling

Longitudinal Roughness	Right Lane	Left Lane	Remarks
$\bar{x}$ mm	6.6	7.2	3 m. Straight Edge Measurement Method
σ mm	4.5	3.3	

PAVEMENT CONDITION AND DISTRESS MEASURMENT RECORD No. 7 Date Dec. 15, 89

Pavement Type : GR , (DBST), BMP , AC
Location: Road Gen. Trias to Amadeo (EPC Section No.3)
Survey Chainage : 0+150 - 0+200

Pavement Condition Rating : VG , G , (F), (B), VB
Survey Length : 50 m. Pavement Width 6.0 m.
Survey Area : 300 m2

Type of Distress	Right Lane		Left Lane		Total	
	Area (m2)	%	Area (m2)	%	Area (m2)	%
Cracks	18.0	12.5	8.2	5.5	26.2	8.7
Potholes	0.1	0.1	0	0	0.1	0.1
Patching						
Abrasion *	46.9	31.3	14.0	9.3	19.5	20.3
Deformation						
Depression						
Others						
Total						

* Streaking and ravelling

Longitudinal Roughness	Right Lane	Left Lane	Remarks
$\bar{x}$ mm	5.4	6.0	3 m. Straight Edge Measurement Method
σ mm	2.8	2.8	

PAVEMENT CONDITION AND DISTRESS MEASURMENT RECORD No. 8 Date Dec. 16, 89

Pavement Type : GR , (DBST), BMP , AC
Location: Road Gen. Trias to Amadeo (EPC Section No. 4)
Survey Chainage : 0+350 - 0+400

Pavement Condition Rating : VG , G , F , (B), VB
Survey Length : 50 m. Pavement Width 6.0 m.
Survey Area : 300 m2

Type of Distress	Right Lane		Left Lane		Total	
	Area (m2)	%	Area (m2)	%	Area (m2)	%
Cracks	30.9	20.6	14.1	9.1	30.0	10.0
Potholes	2.3	1.5	1.8	1.2	4.1	1.4
Patching	5.7	3.8	6.4	4.2	12.1	4.0
Abrasion *	19.3	12.9	30.1	20.1	49.4	16.5
Deformation						
Depression	0	0	9.8	6.5	9.8	3.3
Others						
Total						

* Streaking and ravelling

Longitudinal Roughness	Right Lane	Left Lane	Remarks
$\bar{x}$ mm	5.9 *	7.3 *	3 m. Straight Edge Measurement Method
σ mm	3.3 *	2.2 *	

* Some Potholed and Depressed area are patched and roller compacted by using soil-rock fragment aggregates several days before.

PAVEMENT CONDITION AND DISTRESS MEASURMENT RECORD No. 9 Date Dec. 16, 89

Pavement Type : GR , (DBST), BHP , AC
Location: Road Gen. Trias to Amadeo (EPC Section No.4)
Survey Chainage : 0+400 - 0+450

Pavement Condition Rating : VG , G , F , (B), VB
Survey Length : 50 m. Pavement Width 6.0 m.
Survey Area : 300 m2

Type of Distress	Right Lane		Left Lane		Total	
	Area (m2)	%	Area (m2)	%	Area (m2)	%
Cracks	26.8	17.9	4.0	2.7	30.8	10.3
Potholes	2.6	1.7	1.7	1.7	4.3	1.4
Patching	6.4	4.3	5.4	3.4	11.8	3.9
Abrasion *	23.7	15.8	44.0	29.3	67.7	22.6
Deformation						
Depression	0	0	24.1	16.0	24.1	8.0
Others						
Total						

* Streaking and ravelling

Longitudinal Roughness	Right Lane	Left Lane	Remarks
$\bar{x}$ mm	7.0 *	9.1 *	3 m. Straight Edge Measurement Method
σ mm	3.2 *	4.0 *	

* Some Potholed and Depressed area are patched and roller compacted by using soil-rock fragment aggregates several days before. 1 1

PAVEMENT CONDITION AND DISTRESS MEASURMENT RECORD No. 10 DateDec. 16, 89

Pavement Type : GR , DBST , (BHP), AC
Location: Road Tagaytay to Mendez
Survey Chainage : 0+950 - 1+ 00

Pavement Condition Rating : VG , G , (F), B , VB
Survey Length : 50 m. Pavement Width 6.0 m.
Survey Area : 300 m2

Type of Distress	Right Lane		Left Lane		Total	
	Area (m2)	%	Area (m2)	%	Area (m2)	%
Cracks	11.7	7.8	5.8	3.9	17.6	5.9
Potholes						
Patching	13.6	4.5	8.2	5.5	21.8	7.3
Abrasion						
Deformation						
Depression *	11.1	4.9	21.7	16.0	22.8	7.6
Others						
Total						

* with cracks

Longitudinal Roughness	Right Lane	Left Lane	Remarks
$\bar{x}$ mm	10.7	10.7	3 m. Straight Edge Measurement Method
σ mm	4.5	4.2	

PAVEMENT CONDITION AND DISTRESS MEASURMENT RECORD No. 11 DateDec. 21, 89

Pavement Type : GR , DBST , (BMP), AC
location: Road Tagaytay to Mendez
Survey Chainage : 0+950 - 1+ 00

Pavement Condition Rating : VG , G , (F), B , VB
Survey Length : 50 m. Pavement Width 6.0 m.
Survey Area : 300 m2

Type of Distress	Right Lane		Left Lane		Total	
	Area (m2)	%	Area (m2)	%	Area (m2)	%
Cracks	3.3	0.2	6.6	4.4	13.9	4.6
Potholes						
Patching	7.1	4.7	5.1.2	3.4	12.1	4.0
Abrasion						
Deformation	7.2	4.8	6.4	4.3	13.6	4.5
Depression *	11.1	4.9	21.7	16.0	22.8	7.6
Others						
Total						

* with cracks

longitudinal Roughness	Right Lane	Left Lane	Remarks
$\bar{X}$ mm	15.3	9.6	3 m. Straight Edge Measurement Method
σ mm	7.2	4.2	

PAVEMENT CONDITION AND DISTRESS MEASURMENT RECORD No. 12 DateDec. 21, 89

Pavement Type : GR , DBST , (BMP), AC
location: Road Tagaytay to Mendez
Survey Chainage : 0+250-0+300

Pavement Condition Rating : VG , G , F , (B), VB
Survey Length : 50 m. Pavement Width 6.0 m.
Survey Area : 300 m2

Type of Distress	Right Lane		Left Lane		Total	
	Area (m2)	%	Area (m2)	%	Area (m2)	%
Cracks	16.5	11.0	13.7	9.1	31.6	10.52
Potholes						
Patching	53.4	35.6	16.7	11.1	60.1	23.4
Abrasion						
Deformation	5.6	3.7	6.7	4.5	12.3	4.1
Depression *	20.6	13.7	23.6	15.7	43.8	14.6
Others						
Total						

* with cracks

longitudinal Roughness	Right Lane	Left Lane	Remarks
$\bar{X}$ mm	14.0	12.9	3 m. Straight Edge Measurement Method
σ mm	4.8	6.4	

PAVEMENT CONDITION AND DISTRESS MEASURMENT RECORD No. 13 Date Dec. 20, 89

Pavement Type : GR , DBST , BMP , (AC)
Location: Road Ternate to Pueruto Azule
Survey Chainage : 0+ 00-0+ 50

Pavement Condition Rating : (VG), G , F , B , VB
Survey Length : 50 m. Pavement Width 6.0 m.
Survey Area : 300 m2

Type of Distress	Right Lane		Left Lane		Total	
	Area (m2)	%	Area (m2)	%	Area (m2)	%
Cracks						
Potholes						
Patching						
Abrasion						
Deformation						
Depression						
Others						
Total						

Longitudinal Roughness	Right Lane	Left Lane	Remarks
$\bar{x}$ mm	1.9	1.3	3 m. Straight Edge Measurement Method
σ mm	1.1	0.8	

PAVEMENT CONDITION AND DISTRESS MEASURMENT RECORD No. 14 Date Dec. 18, 89

Pavement Type : GR , DBST , BMP , (AC)
Location: Road Trece Martiez to G. M. Alvarez (EPC Section No. 5)
Survey Chainage : 0+ 50-0+100

Pavement Condition Rating : VG , G , F , (B), VB
Survey Length : 50 m. Pavement Width 6.0 m.
Survey Area : 300 m2

Type of Distress	Right Lane		Left Lane		Total	
	Area (m2)	%	Area (m2)	%	Area (m2)	%
Cracks	41.8	27.9	26.2	17.5	68.0	22.7
Potholes						
Patching	17.5	11.7	10.9	7.3	28.4	9.5
Abrasion						
Deformation						
Depression *	15.0	10.0	8.9	5.9	23.9	15.9
Others						
Total						

* with cracks

Longitudinal Roughness	Right Lane	Left Lane	Remarks
$\bar{x}$ mm	16.6	14.5	3 m. Straight Edge Measurement Method
σ mm	7.4	7.9	

PAVEMENT CONDITION AND DISTRESS MEASUREMENT RECORD No. 15 Date Dec. 18, 89

Pavement Type : GR , DBST , BHP , (AC)
location: Road Trece Martirez to G. M.Alvarez (FPC Section No. 5)
Survey Chainage : 0+350-0+400

Pavement Condition Rating : VG , G , F , (B), VB
Survey Length : 50 m. Pavement Width 6.0 m.
Survey Area : 300 m2

Type of Distress	Right Lane		Left Lane		Total	
	Area (m2)	%	Area (m2)	%	Area (m2)	%
Cracks	52.5	35.0	23.9	15.9	76.4	25.5
Potholes						
Patching	8.5	5.7	7.8	5.2	16.3	5.4
Abrasion						
Deformation						
Depression *	0	0	41.4	27.6	41.4	13.8
Others						
Total						

* with cracks

Longitudinal Roughness	Right Lane	Left Lane	Remarks
$\bar{x}$ mm	11.9	14.0	3 m. Straight Edge Measurement Method
σ mm	5.8	7.0	

Appendix 7–4

LOW–CLASS PAVEMENT CONDITION AND DISTRESS SURVEY REPORT SHEET

Low-Class Pavement Condition and Distress Survey Report Sheet : No. 1 Survey Date. Dec. 8-23, 1989

Pavement Type
- [x] GRAVEL
- [ ] SBST
- [ ] DBST
- [ ] BMP
- [ ] AC

Pavement Construction Year

Location
Province : Cavite
Provincial Road
Magallanes to Maragondon
(EPC Section No. 2)
Station. : 0+300–0+350

Traffic Data and Characteristics as of June 1989 . Nov. 1989

Both Direction		
ADT :	144	80
Trucks :	14	5
Buses :	–	–

Environmental condition : Flat area, rice field and grassy land

Drainage condition : Surface drainage : grassy side ditch
Underground water table : Did not noticed

Pavement Existing Condition Rating *
- [ ] Very Good
- [x] Good
- [x] Fair
- [ ] Bad
- [ ] Very Bad

* See, Rating Sheet

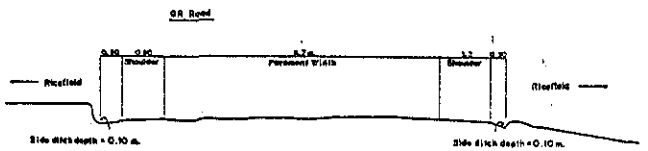
Type of distress, Severity
Well graded sandy gravel not contained cobble / boulder, tightly compacted rather bumpy .

Probable Cause of Distress
Partial weak subgrade containing silt–clay soil

Maintenance operation : Regrading and regravelling once a year or so .

Photo showing representative condition

Road Cross Section



Surface Condition

Roughness		R	L
$\bar{x}$	mm :	13.3	12.4
σ	mm :	5.9	4.4
Crack	% :	–	–
Patching	% :	–	–
Pothole	% :	–	–
Abrasion	% :	–	–
Depression	% :	15.8	8.6

Pavement Cross Section

Gravel surface ave. 10 cm

Subgrade Sands and silty fine sands .

Pavement Material Properties

Surface : Sandy gravel with silt, well graded from coarse gravel to sand and soil binder .

Base :
Material
W(n) % Max size mm 50 2.0mm. pass % 40
0.074mm pass %, PI, CBR 9 NP 29.1

Subbase : No Subbase
Material
W(n) %, Max Size mm 2.0 mm. pass %
0.074 mm pass %, PI CBR

Benkelman Beam Deflection (mm)

n	: 24
Range	: 138–56
x	: 86.0
s	: 21.6
v(%)	: 25.2

Subgrade Soil Properties

Soil Classification ML

W(n)	%	: 21.5
Max. size	mm	: 4.75
0.074 mm pass	%	: 45
	LL	: 41
	PL	: 29
	PI	: 13
	CBR	: 4

Evaluation

1. Serviceability Performance	1. Good to Fair : Good gravel aggregate surfacing , rather bumpy .
2. Design Adequacy	2. Subbase course will be necessary to maintain structural adequacy .
3. Materials Quality	3. Adequate : Well graded gravel surface materials
4. Construction Skills	5. Routine regrading and regravelling
5. Necessary Measures for Maintenance	Open ditch cleaning before and during rainy season

Low-Class Pavement Condition and Distress Survey Report Sheet : No. 2 Survey Date. Dec. 8-23, 1989

Pavement Type	Pavement Construction Year	Location
☑ GRAVEL ☐ SBST ☐ DBST ☐ BMP ☐ AC		Province : Cavite Provincial Road Magallanes to Maragondon (EPC Section No. 2) Station. : 0+350 – 0+400

Traffic Data and Characteristics as of June 1989 . Nov. 1988		
Both Direction		
ADT :	144	80
Trucks :	14	5
Buses :	–	–

Environmental condition : Flat , grassy and rice field area

Drainage condition : Surface drainage : grassy side ditch
Underground water level : Did not noticed

Pavement Existing Condition Rating * : ☐ Very Good ☑ Good ☑ Fair ☐ Bad ☐ Very Bad
* See, Rating Sheet

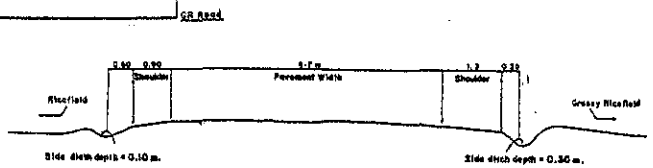
Type of distress, Severity : Well graded sandy gravel not contained cobble / boulder , rather tightly compacted .

Probable Cause of Distress : Partial weak subgrade containing silt-clay soil .

Maintenance operation : Regrading and regravelling once a year or so .

Photo showing representative condition

Road Cross Section



Surface Condition

Roughness		R	L
$\bar{X}$	mm :	15.5	15.9
σ	mm :	9.7	9.0
Crack	% :	–	–
Patching	% :	–	–
Pothole	% :	–	–
Abrasion	% :	–	–
Depression	% :	7.1	10.9

Pavement Cross Section

Gravel surface	ave. 12 cm
Subgrade	Sands and silty fine sands

Pavement Material Properties

Surface : Sandy gravel with silt rather fine graded, lack of coarse sand and gravel

Base :
Material
W(n) % Max size mm 50 2.0mm. pass % 61
0.074mm pass %, PI, CBR 17 NP 18.3

Subbase : No Subbase
Material
W(n) %, Max Size mm 2.0 mm. pass %
0.074 mm pass %, PI CBR

Benkelman Beam Deflection (mm)

n	:	12
Range	:	138-76
x	:	111.2
s	:	25.4
v(%)	:	22.8

Subgrade Soil Properties

Soil Classification ML

W(n)	%	: 9.1
Max. size	mm	: 19
0.074 mm pass	%	: 23
	LL	: 29
	PL	: 22
	PI	: 7
	CBR	: 6

Evaluation

1. Serviceability Performance : 1. Good to Fair : Good gravel aggregate surfacing , rather bumpy .
2. Design Adequacy : 2. Subbase course will be necessary for structural adequacy .
3. Materials Quality : 3. Gravel surface layer : Not adequate ; coarse aggregates, 2-50 mm size are lacking (lack of aggregate interlocking) .
4. Construction Skills : 5. Regravelling using good sandy gravel
5. Necessary Measures for Maintenance : Open ditch cleaning before and during rainy season

Low-Class Pavement Condition and Distress Survey Report Sheet : No. 3 Survey Date. Dec. 8-23, 1989

Pavement Type

- [x] GRAVEL
- [ ] SBST
- [ ] DBST
- [ ] BMP
- [ ] AC

Pavement Construction Year

Location

Province : Cavite
Provincial Road
Alfonso to Magallanes
(EPC Section No. 1)
Station. : 0+400 – 0+450

Traffic Data and Characteristics as of June 1988.

Both Direction
ADT : 268
Trucks : 11
Buses : 12

Environmental condition

The road is running on the ridge of highland area
Coconut , Pineapple , Coffee plantation area

Drainage condition

Surface drainage : grassy side ditch
Underground water drainage : Did not noticed

Pavement Existing Condition Rating *

- [ ] Very Good
- [ ] Good
- [ ] Fair
- [x] Bad
- [ ] Very Bad

* See, Rating Sheet

Type of distress, Severity

Mostly depressed and bumpy surface .
Maximum depression is 7 to 10 cm.

Probable Cause of Distress

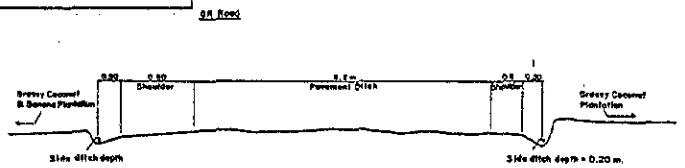
Much silt – clay gravel surface
Not good surface drainage :
Water stagnant in depressed area due to inadequate maintenance for road surface and side ditch cleaning .

Maintenance operation

Regrading and regravelling once a year .

Photo showing representative condition

Road Cross Section



Surface Condition

Roughness		R	L
$\bar{X}$	mm :	22.6	24.4
σ	mm :	13.7	14.1
Crack	% :	–	–
Patching	% :		
Pothole	% :	–	–
Abrasion	% :	–	–
Depression	% :	78.8	52.5

Pavement Cross Section

Gravel surface	ave. 10 cm.
Subgrade	Sands, silty fine sands or clayey fine sands

Pavement Material Properties

Surface : Cobble, gravel, silt and clay, fine graded and having excess amount of fines .

Base :
Material
W(n) % Max size mm 2.0 mm. pass % 50 54
0.074mm pass %, PI, CBR 22 NP 14.6

Subbase : No Subbase
Material
W(n) %, Max Size mm 2.0 mm. pass %
0.074 mm pass %, PI CBR

Benkelman Beam Deflection (mm)

n : 24
Range : 218–76
x : 131.5
s : 36.2
v(%) : 27.5

Subgrade Soil Properties

Soil Classification ML–MH

W(n)	%	: 45.2
Max. size	mm	: 4.75
0.074 mm pass	%	: 54
LL		: 50
PL		: 38
PI		: 12
CBR		: 4

Evaluation

1. Serviceability Performance
2. Design Adequacy
3. Materials Quality
4. Construction Skills
5. Necessary Measures for Maintenance

1. Bad : Depressed and irregular , bumpy surface .
2. More thicker surfacing , and subbase course would be necessary .
3. Aggregate surface material : Not adequate ; coarse aggregates , 2–50 mm size are lacking , and contains much amount of fines.
4. Remove cobble and boulder , Regravel and regrade using appropriate sandy gravel materials .

Low-Class Pavement Condition and Distress Survey Report Sheet :

No. 4 Survey Date. Dec. 8-23, 1989

Pavement Type

- ☐ GRAVEL
- ☐ SBST
- ☑ DBST
- ☐ BMP
- ☐ AC

Pavement Construction Year

October, 1983

Location

Province : Cavite
Provincial Road
Alfonso to Gen. Aguinaldo

Station. : 0+150 – 0+200

Traffic Data and Characteristics as of June 1988.

Both Direction
ADT : 268

Trucks : 12
Buses : 11

Environmental condition

Highland area
Both sides residential area

Drainage condition

Surface drainage : grassy side ditch
Underground water table : Did not noticed

Pavement Existing Condition Rating *

- ☐ Very Good
- ☑ Good
- ☐ Fair
- ☐ Bad
- ☐ Very Bad

* See, Rating Sheet

Type of distress, Severity

DBST with seal coat surface has good water tight texture and good flexibility .

Abrasion : Longitudinal streak ravelling of seal coat and DBST second layer (slightly ravelled surface).

Probable Cause of Distress

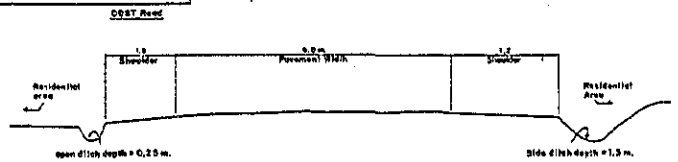
DBST second layer asphalt binder spray streaking (longitudinal) due to insufficient skill.

Maintenance operation

After DBST pavement had constructed maintenance has mostly not been needed .

Photo showing representative condition

Road Cross Section



Surface Condition

Roughness		R	L
$\bar{X}$	mm :	6.6	4.9
σ	mm :	2.9	1.9
Crack	% :	–	–
Patching	% :	–	–
Pothole	% :	–	–
Abrasion	% :	6.8	4.7
Depression	% :	–	–

Pavement Cross Section

	DBST with Seal Coat
15 cm Base	Well graded crushed stone and sand
14 cm Subbase	Medium to fine sand
Subgrade	Silty sands with pea gravel

Pavement Material Properties

Surface : Asphalt binder and cover aggregate application rates are adequate

1st layer cover aggr. 19–10 mm
2nd layer cover aggr. 10–3 mm

Base : Crushed stone, sand and silt
Material

W(n) % Max size mm 37.5 2.0mm. pass % 40

0.074mm pass %, PI, CBR
11 NP 106

Subbase :
Material. Medium to fine sand

W(n) %, Max Size mm 2.0 mm. pass % 67

0.074 mm pass %, PI CBR
14 NP 29

Benkelman Beam Deflection (mm)

n : 24
Range : 126–38
x : 63.3
s : 23.5
v(%) : 36.9

Subgrade Soil Properties

Soil Classification SM

W(n)	%	: 13.9
Max. size	mm	: 4.75
0.074 mm pass	%	: 15
	LL	: NP
	PL	: NP
	PI	: NP
	CBR	: 17

Evaluation

1. Serviceability Performance
2. Design Adequacy
3. Materials Quality
4. Construction Skills
5. Necessary Measures for Maintenance

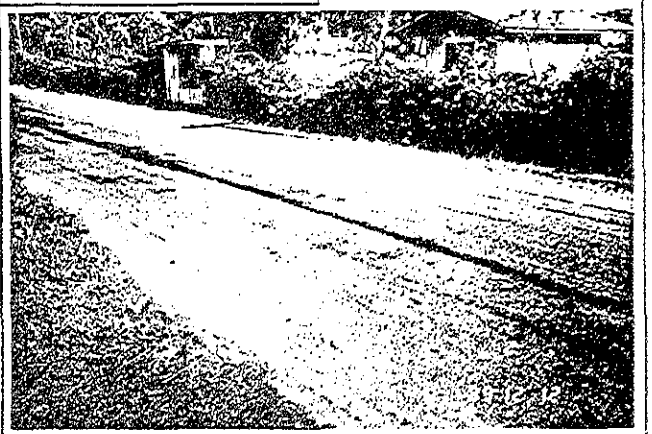
1. Good : Slightly ravelled surface, good comfortable riding surface, low Benkelman Beam Deflection value (high load bearing capacity).
2. Adequate for this road traffic condition .
3. Surface and base materials are adequate .
4. Mostly good skills for base and surface construction .
5. Seal coat for ravelled surface .

Low-Class Pavement Condition and Distress Survey Report Sheet : No. 5 Survey Date. Dec. 8-23, 1989

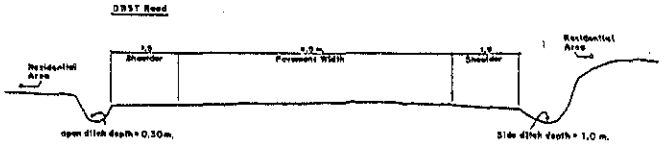
Pavement Type	Pavement Construction Year	Location	Traffic Data and Characteristics as of June 1988.	Environmental condition
☐ GRAVEL ☐ SBST ☑ DBST ☐ BMP ☐ AC	October, 1983	Province : Cavite Provincial Road Alfonso to Gen. Aguinaldo Station. : 0+250 – 0+300	Both Direction ADT : 268 Trucks : 12 Buses : 11	Highland area Both sides residential area
				Drainage condition : Surface drainage : grassy side ditch Underground water table : Did not noticed

Pavement Existing Condition Rating *	Type of distress, Severity	Probable Cause of Distress	Maintenance operation
☐ Very Good ☑ Good ☑ Fair ☐ Bad ☐ Very Bad * See, Rating Sheet	DBST with seal coat (not ravelled) has good water tight texture and good flexibility . Abrasion : Longitudinal streak ravelling of seal coat and DBST second layer due to asphalt binder spray streaking .	DBST second layer asphalt binder spray streaking (longitudinal) due to insufficient skill .	After DBST pavement had constructed maintenance has mostly not been needed .

Photo showing representative condition



Road Cross Section



Surface Condition	Roughness		R	L
	$\bar{X}$	mm :	6.2	5.6
	σ	mm :	1.4	1.7
	Crack	% :	–	–
	Patching	% :	–	–
	Pothole	% :		
	Abrasion	% :	18.2	6.8
	Depression	% :	–	–

Pavement Cross Section

DBST with Seal Coat	
25 cm Base	Crushed stone, sand and silt
7 cm Subbase	Fine graded crushed stone sand and silt
Subgrade	Silty sand with pea gravel

Pavement Material Properties

Surface : Asphalt binder and cover aggregate application rates are adequate .

Base :
Material
W(n) % Max size mm 2.0mm. pass %
0.074mm pass %, PI, CBR

Subbase :
Material
W(n) %, Max Size mm 2.0 mm. pass %
0.074 mm pass %, PI CBR

Subgrade Soil Properties

Soil Classification SM

W(n)	%	: 13.2
Max. size	mm	: 9.5
0.074 mm pass	%	: 13
	LL	: NP
	PL	: NP
	PI	: NP
	CBR	: 11

Benkelman Beam Deflection (mm)		
	n	: 24
	Range	: 86–54
	x	: 74.1
	s	: 7.2
	v(%)	: 9.7

Evaluation

1. Serviceability Performance	1. Good to Fair : Slight to medium ravelled surface, comfortable riding surface, low Benkelman Beam Deflection value (high load bearing capacity) .
2. Design Adequacy	2. Adequate for this road traffic condition .
3. Materials Quality	3. Surface and base materials are adequate .
4. Construction Skills	4. Not well trained skill for asphalt binder spraying in some portion .
5. Necessary Measures for Maintenance	5. Seal coat for ravelled surface .

Low-Class Pavement Condition and Distress Survey Report Sheet : No. 6 Survey Date. Dec. 8-23, 1989

Pavement Type

- [ ] GRAVEL
- [ ] SBST
- [x] DBST
- [ ] BMP
- [ ] AC

Pavement Construction Year

August 23, 1983

Location

Province : Cavite
Provincial Road
Gen. Trias to Amadeo
(EPC Section No. 3)
Station. : 0+100 – 0+150

Traffic Data and Characteristics as of Nov. 1989.

Both Direction
ADT : 654
Trucks : 37
Buses : 2

Environmental condition

Flat area
Along road : residential area
Hinterland : rice field

Drainage condition

Surface drainage : grassy side ditch
Underground water drainage : Did not noticed

Pavement Existing Condition Rating *

- [ ] Very Good
- [ ] Good
- [x] Fair
- [ ] Bad
- [ ] Very Bad

* See, Rating Sheet

Type of distress, Severity

Alligator cracks : Due to partially weak subgrade soil, however not seggregated.
Abrasion : Longitudinal streak ravelling of seal coat and DBST second layer.

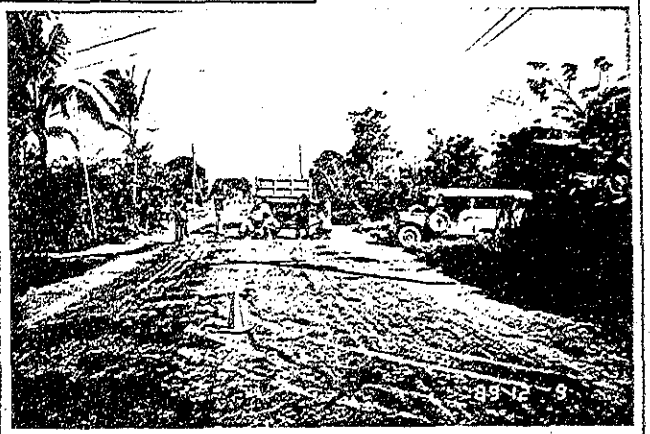
Probable Cause of Distress

Alligator cracks : Due to structural failure (partial weak subbase and/or weak subgrade).
Abrasion : Inadequate asphalt binder spraying and cover aggregate spreading.

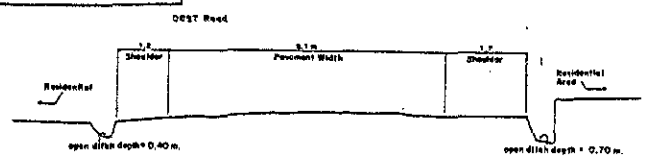
Maintenance operation

AC overlay work is scheduled, because of the development of surface distress on neighboring sections.

Photo showing representative condition



Road Cross Section



Surface Condition

Roughness		R	L
$\bar{X}$	mm :	6.6	7.2
σ	mm :	4.5	3.3
Crack	% :	17.2	28.4
Patching	% :	0.4	0.
Pothole	% :	–	–
Abrasion	% :	13.0	3.0
Depression	% :	–	–

Pavement Cross Section

DBST with Seal Coat
11 cm Base — Crushed stone, sand and silt
16 cm Subbase — Silty sand with pea gravel
Subgrade — Silty fine sands

Pavement Material Properties

Surface : Asphalt binder and cover aggregate application rates are adequate. In some portion, dirty cover aggregates were seen.

Base : Well graded coarse to fine aggregates
W(n) % Max size mm 37.5 — 2.0mm. pass % 27
0.074mm pass %, PI, CBR 7 NP 82

Subbase : Rather fine graded Material
W(n) %, Max Size mm 19 — 2.0 mm. pass % 42
0.074 mm pass %, PI CBR 12 NP 11.4

Benkelman Beam Deflection (mm)

n : 24
Range : 138–70
x : 84.6
s : 17.5
v(%) : 20.1

Subgrade Soil Properties

Soil Classification SM and ML

W(n) % : 19.2
Max. size mm : 4.75
0.074 mm pass % : 31
LL : NP
PL : NP
PI : NP
CBR : 8

Evaluation

1. Serviceability Performance
2. Design Adequacy
3. Materials Quality
4. Construction Skills
5. Necessary Measures for Maintenance

1. Fair : Not severely cracked and ravelled, not depressed surface comfort to bumpy riding.
2. If stage construction strategy was planned, the design would be adequate.
3. Good except some contaminated cover aggregate in some portion.
4. Not well trained skills for asphalt binder spraying and cover aggregate spreading.
5. Partial replacement of pavement, then AC overlay is necessary.

Low-Class Pavement Condition and Distress Survey Report Sheet : No. 7 Survey Date. Dec. 8-23, 1989

Pavement Type

- [ ] GRAVEL
- [ ] SBST
- [x] DBST
- [ ] BMP
- [ ] AC

Pavement Construction Year

August, 1983

Location

Province : Cavite
Provincial Road
Gen. Trias to Amadeo
(EPC Section No. 3)
Station. : 0+150 – 0+200

Traffic Data and Characteristics as of Nov 1989.

Both Direction
ADT : 654
Trucks : 37
Buses : 2

Environmental condition

Flat area
Along road : residential area
Hinterland : rice field

Drainage condition

Surface drainage : grassy side ditch
Underground water table : Did not noticed

Pavement Existing Condition Rating *

- [ ] Very Good
- [ ] Good
- [x] Fair
- [ ] Bad
- [ ] Very Bad

* See, Rating Sheet

Type of distress, Severity

Alligator cracks : Not seggregated .
Abrasion : Longitudinal streak ravelling of seal coat and DBST second layer .

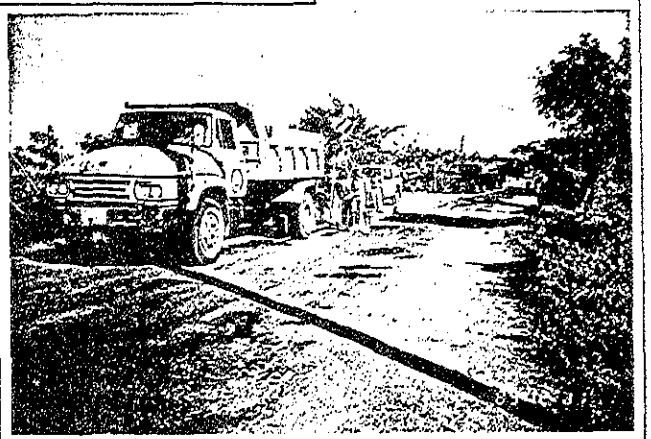
Probable Cause of Distress

Alligator cracks : Due to structural failure (partial weak subbase and/or weak subgrade).
Abrasion : Inadequate skills for asphalt binder spraying and cover aggregates spreading .

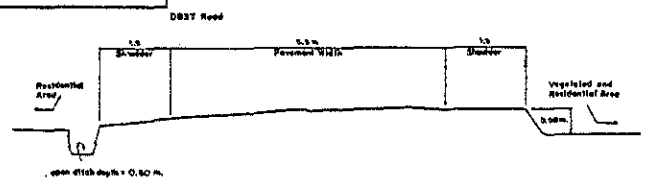
Maintenance operation

AC overlay work is scheduled for rehabilitation of this pavement road .

Photo showing representative condition



Road Cross Section



Surface Condition

Roughness		R	L
$\bar{X}$	mm :	5.4	6.0
σ	mm :	2.8	2.8
Crack	% :	12.0	26.4
Patching	% :	–	–
Pothole	% :	–	–
Abrasion	% :	31.3	9.3
Depression	% :	–	–

Pavement Cross Section

	DBST with Seal coat
13 cm Base	Crushed stone, sand and silt
8 cm Subbase	Silty sand with pea gravel
Subgrade	Silty fine sand

Pavement Material Properties

Surface : In some portion, under size and contaminated cover aggregates were used .

Base : Well graded aggregates
Material
W(n) % Max size mm 37.5 2.0 mm. pass % 32
0.074mm pass %, PI, CBR 8 NP 75

Subbase : Rather fine graded aggregates
Material
W(n) %, Max Size mm 19.0 2.0 mm. pass % 58
0.074 mm pass %, PI CBR 19 NP 16.9

Benkelman Beam Deflection (mm)

n : 24
Range : 118 – 60
x : 83.8
s : 13.8
v(%) : 16.6

Subgrade Soil Properties

Soil Classification SM and ML

W(n)	%	: 17.9
Max. size	mm	: 4.75
0.074 mm pass	%	: 23
	LL	: NP
	PL	: NP
	PI	: NP
	CBR	: 9

Evaluation

1. Serviceability Performance
2. Design Adequacy
3. Materials Quality
4. Construction Skills
5. Necessary Measures for Maintenance

1. Fair : Not severely cracked and ravelled, not depressed surface comfort to bumpy riding surface .
2. If stage construction strategy was planned in this road improvement program, this design would be adequate .
4. Not well trained skills for asphalt binder spraying and cover aggregate spreading .
5. Partial replacement of pavement, then AC overlay .

Low-Class Pavement Condition and Distress Survey Report Sheet : No. 8 Survey Date. Dec. 8-28, 1989

Pavement Type

- [ ] GRAVEL
- [ ] SBST
- [x] DBST
- [ ] BMP
- [ ] AC

Pavement Construction Year

August, 1983

Location

Province : Cavite
Provincial Road
Gen. Trias to Amadeo
(EPC Section No. 4)

Station. : 0+350 – 0+400

Traffic Data and Characteristics as of Nov. 1989

Both Direction
ADT : 654

Trucks : 37
Buses : 2

Environmental condition

Flat area
Both sides of road are rice field

Drainage condition

Surface drainage : grassy side ditch
Underground water table : Did not noticed

Pavement Existing Condition Rating *

- [ ] Very Good
- [ ] Good
- [ ] Fair
- [x] Bad
- [ ] Very Bad

* See, Rating Sheet

Type of distress, Severity

Alligator cracks : Mostly not segreggated, some are become potholed and patched .
Abrasion : Longitudinal streak ravelling of seal coat and DBST layers .

Probable Cause of Distress

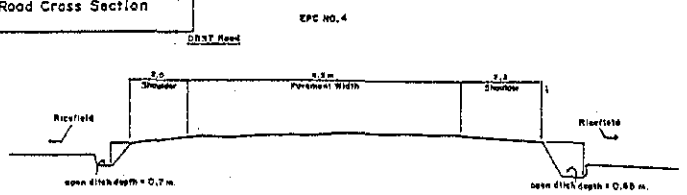
Alligator cracks : Mostly structural failure due to weak subgrade and weak subbase .
Abrasion : Inadequate skills for asphalt binder spraying and cover aggregate spreading .

Maintenance operation

Potholes patching *
AC overlay is scheduled for rehabilitation of this pavement road .

Photo showing representative condition

Road Cross Section



Surface Condition

Roughness		R	L
$\bar{X}$	mm :	5.9 *	7.3 *
σ	mm :	3.3	2.2
Crack	% :	20.6	9.4
Patching	% :	3.8	4.2
Pothole	% :	1.5	1.2
Abrasion	% :	12.9	20.1
Depression	% :	0	6.5

Pavement Cross Section

	DBST with Seal coat
15 cm Base	Crushed stone, sand and silt
10 cm Subbase	Silty sand with pea gravel
Subbase	Silty fine sands or clayey fine sands

Pavement Material Properties

Surface : In some portion, under size and contaminated aggregates were used

Base : Well graded aggregate Material
W(n) % Max size mm 37.5 2.0 mm. pass % 31
0.074 mm pass %, PI, CBR 10 NP 67

Subbase : Fine graded, lack of coarse aggregates Material
W(n) %, Max Size mm 19.0 2.0 mm. pass % 63
0.074 mm pass %, PI CBR 17 NP 17.9

Subgrade Soil Properties

Soil Classification ML or MH

W(n)	%	: 31.8
Max. size	mm	: 2.0
0.074 mm pass	%	: 54
	LL	: NP
	PL	: NP
	PI	: NP
	CBR	: 4

Benkelman Beam Deflection (mm)

n	:	24
Range	:	208–152
x	:	179.6
s	:	16.8
v(%)	:	9.3

Evaluation

1. Serviceability Performance
2. Design Adequacy
3. Materials Quality
4. Construction Skills
5. Necessary Measures for Maintenance

1. Bad : Rather severely cracked , some cracked portions are already become potholed and were patched . Bumpy riding
2. For high underground table, weak subgrade condition that is close to rice field section , more thicker pavement design would be required .
3.
4. Not well trained skills for asphalt binder spraying and cover aggregate spreading
5. Partial replacement of pavement , then AC overlay

* Some Potholes and Depressed area were patched and roller compacted by soil-rock fragments aggregates several day before .

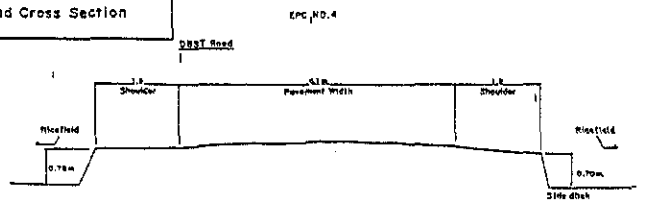
Low-Class Pavement Condition and Distress Survey Report Sheet : No. 9 Survey Date. Dec. 8-23, 1989

Pavement Type	Pavement Construction Year	Location	Traffic Data and Characteristics as of Nov 1988	Environmental condition
☐ GRAVEL ☐ SBST ☒ DBST ☐ BMP ☐ AC	August, 1983	Province : Cavite Provincial Road Gen. Trias to Amadeo (EPC Section No. 4) Station. : 0+400 – 0+450	Both Direction ADT : 654 Trucks : 37 Buses : 2	Flat area Both sides of road are rice field
				Drainage condition : Surface drainage : grassy side ditch Underground water table : Did not noticed

Pavement Existing Condition Rating *	Type of distress, Severity	Probable Cause of Distress	Maintenance operation
☐ Very Good ☐ Good ☐ Fair ☒ Bad ☐ Very Bad * See, Rating Sheet	Alligator cracks : Mostly not segregated, some are become potholed and patched . Abrasion : Longitudinal streak ravelling of seal coat and DBST layers .	Alligator cracks : Mostly partial structural failure due to weak subgrade and weak subbase . Abrasion : Inadequate skills for asphalt binder spraying and cover aggregate spreading .	Potholes patching * AC overlay is scheduled for rehabilitation of this pavement road .

Photo showing representative condition

Road Cross Section



Surface Condition	Roughness	R	L
	$\bar{X}$ mm :	7.0 *	9.1 *
	σ mm :	3.2	4.0
	Crack % :	2.7	10.3
	Patching % :	4.3	11.8
	Pothole % :	1.7	1.7
	Abrasion % :	15.3	29.3
	Depression % :	0	24.1

Pavement Cross Section

	DBST with Seal coat
16 cm Base	Crushed rock, sand, and silt
7 cm Subbase	Silty sand with pea gravel
Subgrade	Sandy and silty clay

Pavement Material Properties

Surface : In some portion, under size and contaminated cover aggregates were used .

Base : Well graded aggregate
Material
W(n) % Max size mm 37.5 2.0mm. pass % 38
0.074mm pass %, PI, CBR 9 NP 78

Subbase : Fine graded, lack of coarse aggregate
Material
W(n) %, Max Size mm 2.0 mm. pass % 20
0.074 mm pass %, PI CBR 18 NP 15

Benkelman Beam Deflection (mm)		
	n	: 24
	Range	: 202 – 150
	x	: 162.3
	s	: 31.5
	v(%)	: 19.4

Subgrade Soil Properties

Soil Classification ML or MH

W(n)	%	: 23.6
Max. size	mm	: 4.75
0.074 mm pass	%	: 43
	LL	: NP
	PL	: NP
	PI	: NP
	CBR	: 6

Evaluation

1. Serviceability Performance
2. Design Adequacy
3. Materials Quality
4. Construction Skills
5. Necessary Measures for Maintenance

1. Bad : Rather severely cracked, some cracked and depressed portions are already became potholed and were patched .
2. For high underground table and weak subgrade condition that is close to rice field section, more thicker pavement would required .
4. Not well trained skills for asphalt binder spraying and cover aggregate spreading .
5. Partial replacement of pavement, then AC overlay .

* Some Potholes and Depressed area were patched and roller compacted by soil-rock fragments aggregates several day before .

Low-Class Pavement Condition and Distress Survey Report Sheet : No. 10 Survey Date. Dec. 8-23, 1989

Pavement Type	Pavement Construction Year	Location	Traffic Data and Characteristics as of June 1989.	Environmental condition
☐ GRAVEL ☐ SBST ☐ DBST ☑ BMP ☐ AC	1981	Province : Cavite National Road Tagaytay to Mendez Station. : 0+950 – 1+000	Both Direction ADT : 668 Trucks : Buses : 98	Highland, grass and banana field

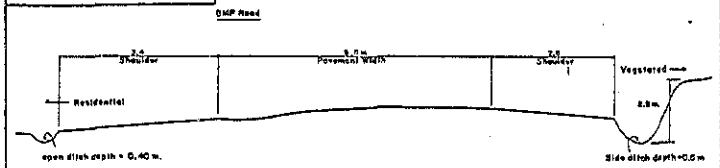
Drainage condition : Surface drainage : grassy side ditch

Underground water table : Did not noticed

Pavement Existing Condition Rating *	Type of distress, Severity	Probable Cause of Distress	Maintenance operation
☐ Very Good ☐ Good ☑ Fair ☐ Bad ☐ Very Bad * See, Rating Sheet	Partially depressed and deformed, however mostly water proofing and flexible surface .	Mostly due to partially weak subgrade soil condition.	Patching maintenance and repair operation is operating .

Photo showing representative condition

Road Cross Section



Surface Condition	Roughness		R	L
	$\bar{x}$	mm :	10.7	10.7
	σ	mm :	4.5	4.2
	Crack	% :	7.8	3.9
	Patching	% :	4.5	5.5
	Pothole	% :	–	–
	Abrasion	% :	–	–
	Depression	% :	4.9	16.0

Pavement Cross Section

4 cm BMP	
5 cm Macadam stone base	Max. size 50 mm
14 cm Subbase	Well compacted rock fragments, sand and silt
Subgrade	Sand and silt with pea gravel

Pavement Material Properties

Surface : Each layer crushed stone; 30–10 mm (base) 20–10 mm(key), 5–3 mm (cover) are hard and clean . Asphalt binder has still viscos and good binding power .

Base : Macadam base crushed stone

W(n) % Max size mm 50 2.0 mm. pass % 18

0.074mm pass %, PI, CBR 5 NP

Subbase : Rock fragments

Material

W(n) %, Max Size mm 2.0 mm. pass %

0.074 mm pass %, PI CBR 11 NP 20.6

Benkelman Beam Deflection (mm)		
	n	: 24
	Range	: 242–78
	x	: 138.3
	s	: 47.3
	v(%)	: 34.2

Subgrade Soil Properties

Soil Classification

W(n)	%	: 44.1
Max. size	mm	: 19
0.074 mm pass	%	: 30
	LL	: NP
	PL	: NP
	PI	: NP
	CBR	: 10

Evaluation

1. Serviceability Performance	1. Fair to Base : Still water proofing durable surface, however, slight bump surface .
2. Design Adequacy	2. Adequate if rehabilitation overlay was programed .
3. Materials Quality	3. Asphalt and aggregates quality and application rate for BMP are adequate .
4. Construction Skills	4. Adequate .
5. Necessary Measures for Maintenance	5. Only partial replacement of depressed area and AC overlay . Shoulder grass cutting for surface drainage .

Low-Class Pavement Condition and Distress Survey Report Sheet : No. 11 Survey Date. Dec. 8-23, 1989

Pavement Type	Pavement Construction Year	Location	Traffic Data and Characteristics as of June, 1989	Environmental condition
☐ GRAVEL ☐ SBST ☐ DBST ☑ BMP ☐ AC	1981	Province : Cavite National Road Tagaytay to Mendez Station. : 1+000 – 1+050	Both Direction ADT : 668 Trucks : 26 Buses : 98	Highland, grass and banana field

Drainage condition	Maintenance operation
Surface drainage : grassy side ditch Underground water table : Did not noticed	Patching maintenance and repair is operating.

Pavement Existing Condition Rating *

☐ Very Good
☐ Good
☑ Fair
☑ Bad
☐ Very Bad

* See, Rating Sheet

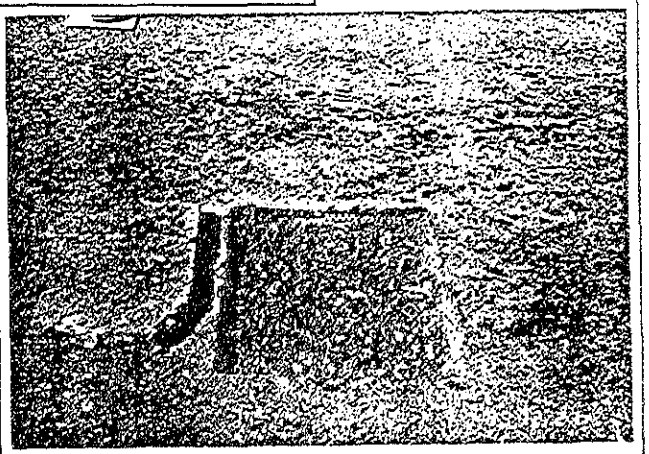
Type of distress, Severity

Surface deformation and depression, also potholes are rather severe.
Surface is bumpy.

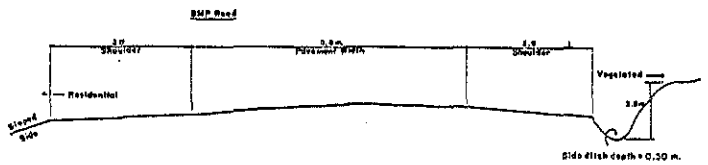
Probable Cause of Distress

Non uniform spraying of asphalt binder.

Photo showing representative condition



Road Cross Section



Surface Condition

Roughness		R	L
$\bar{X}$	mm :	15.3	9.6
σ	mm :	7.2	4.2
Crack	% :	0.2	4.4
Patching	% :	4.7	3.4
Pothole	% :	–	–
Abrasion	% :	–	–
Depression	% :	4.9	16.0
Deformation	:	4.8	4.6

Pavement Cross Section

3 cm BMP
8 cm Macadam stone base — Max. size 50 mm with rock fragments
Subgrade

Pavement Material Properties

Surface : In some part, asphalt binder (asphalt cement) has aged and lost its binding power.

Base : Macadam base stone
Material
W(n) % Max size mm 50 2.0 mm. pass % 18
0.074mm pass %, PI, CBR 4 NP

Subbase : No Subbase
Material
W(n) %, Max Size mm 2.0 mm. pass %
0.074 mm pass %, PI CBR

Benkelman Beam Deflection (mm)

n	:	24
Range	:	272–74
x	:	130.8
s	:	44.2
v(%)	:	33.8

Subgrade Soil Properties

Soil Classification

W(n)	%	: 44.1
Max. size	mm	: 4.75
0.074 mm pass	%	: 66
	LL	: NP
	PL	: NP
	PI	: NP
	CBR	: 7

Evaluation

1. Serviceability Performance : 1. Fair to bad : Still water proofing and durable surface, however, some portion is irregular and bumping.
2. Design Adequacy : 2. Subbase layer should have designed.
3. Materials Quality : 3. Asphalt and aggregate and their application rate are adequate.
4. Construction Skills : 4. Insufficient skill for asphalt spraying.
5. Necessary Measures for Maintenance : 5. Only partial replacement of depressed area and AC overlay.

Low-Class Pavement Condition and Distress Survey Report Sheet : No. 12 Survey Date. Dec. 8-23, 1989

Pavement Type	Pavement Construction Year	Location	Traffic Data and Characteristics as of	Environmental condition
☐ GRAVEL ☐ SBST ☐ DBST ☑ BMP ☐ AC	1981	Province : Cavite National Road Tagaytay to Mendez Station. : 0+250 - 0+300	Both Direction ADT : 668 Trucks : 26 Buses : 98	Highland flat, firm and residential area

Drainage condition

Surface drainage : grassy side ditch

Underground water table : Did not noticed

Pavement Existing Condition Rating *

☐ Very Good
☐ Good
☐ Fair
☑ Bad
☐ Very Bad

* See, Rating Sheet

Type of distress, Severity

Abrasion, depression and deformation are severe. Surface is badly bumpy.

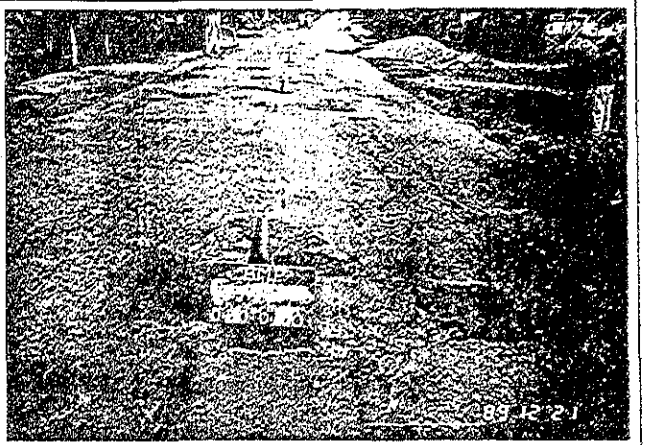
Probable Cause of Distress

Cracks due to loss of surface course flexibility (poor asphalt content).
Rainfall water penetrates into pavement body through craks.

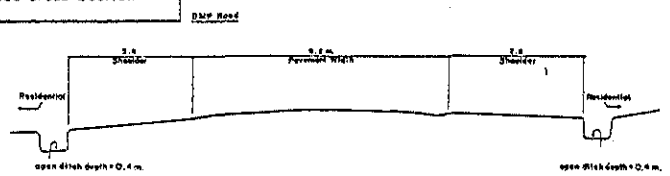
Maintenance operation

Patching maintenance and repair is operating throughout a year.

Photo showing representative condition



Road Cross Section



Surface Condition

Roughness		R	L
$\bar{X}$	mm :	16.2	12.9
σ	mm :	7.7	6.4
Crack	% :	0.2	4.4
Patching	% :	11.0	9.1
Pothole	% :	—	—
Abrasion	% :	35.6	11.1
Depression	% :	13.7	15.7
Deformation	:	3.7	4.5

Pavement Cross Section

4 cm BMP
10 cm Macadam stone base — Max. size 50 mm
Subgrade — Silty clay with rock fragments

Pavement Material Properties

Surface : Less amount asphalt sprayed penetration Macadam Britt asphalt macadam surface.

Base : Macadam base stone

Material

W(n) % Max size mm 50 2.0mm. pass % 2

0.074mm pass %, PI, CBR NP

Subbase : No Subbase

Material

W(n) %, Max Size mm 2.0 mm. pass %

0.074 mm pass %, PI CBR

Benkelman Beam Deflection (mm)

n : 24
Range : 308-180
x : 233.8
s : 34.5
v(%) : 14.8

Subgrade Soil Properties

Soil Classification

W(n)	%	: 20.1
Max. size	mm	: 19
0.074 mm pass	%	: 46
	LL	: NP
	PL	: NP
	PI	: NP
	CBR	: 5

Evaluation

1. Serviceability Performance
2. Design Adequacy
3. Materials Quality
4. Construction Skills
5. Necessary Measures for Maintenance

1. Bad : Severely cracked and depressed and bumpy riding surface.
2. Subbase layer should have designed.
3. Poor asphalt application rate portion was noticed.
4. Penetration macadam work skill was not adequate.
5. Reconstruction because of high surface deflection value.

Low-Class Pavement Condition and Distress Survey Report Sheet : No. 13 Survey Date. Dec. 8-23, 1989

Pavement Type

- [ ] GRAVEL
- [ ] SBST
- [ ] DBST
- [ ] BMP
- [x] AC

Pavement Construction Year: 1986

Location

Province : Cavite
National Road
Ternate to Puerto Azul

Station. : 0+000 - 04050

Traffic Data and Characteristics as of June 1989

Both Direction
ADT : 1338

Trucks : 179
Buses : 109

Environmental condition: Both side residential area

Drainage condition: Surface drainage : grassy side ditch
Underground water table : underground water level may not be so high.

Pavement Existing Condition Rating ※

- [x] Very Good
- [ ] Good
- [ ] Fair
- [ ] Bad
- [ ] Very Bad

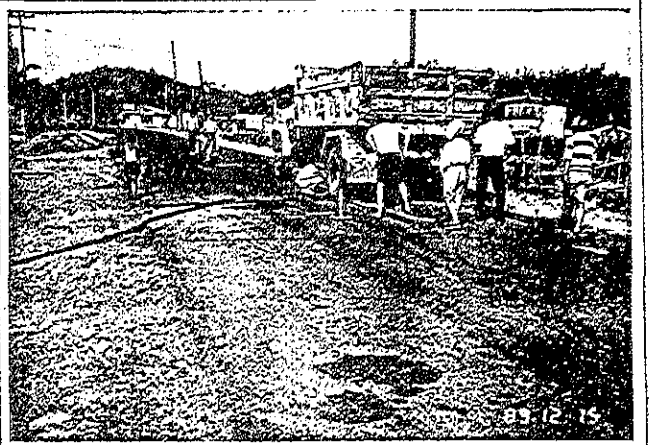
※ See, Rating Sheet

Type of distress, Severity: Well layed and compacted smooth AC surface with no deffect.

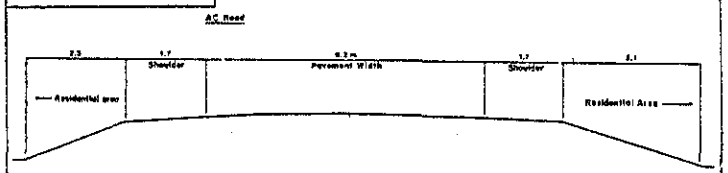
Probable Cause of Distress

Maintenance operation

Photo showing representative condition



Road Cross Section



Surface Condition

Roughness		R	L
$\bar{X}$	mm :	1.9	1.3
σ	mm :	1.1	0.8
Crack	% :	–	–
Patching	% :	–	–
Pothole	% :	–	–
Abrasion	% :	–	–
Depression	% :	–	–

Pavement Cross Section

6.5 cm Surface	Dense graded AC
13.5 cm Base	Crushed stone, sand, silt-clay
9 cm Subbase	Silty sand with some gravel
Subgrade	

Pavement Material Properties

Surface : Dense graded AC mix with adequate asphalt content.

Base : Rather fine grading Material
W(n) % Max size mm 50 2.0mm. pass % 47
0.074mm pass %, PI, CBR 16 NP 61.3

Subbase : Rather fine grading Material
W(n) %, Max Size mm 37.5 2.0 mm. pass % 41
0.074 mm pass %, PI CBR 11 NP 29.8

Subgrade Soil Properties

Soil Classification

W(n)	%	: 83
Max. size	mm	: 19
0.074 mm pass	%	: 31
	LL	: NP
	PL	: NP
	PI	: NP
	CBR	: 8

Benkelman Beam Deflection (mm)

n	: 24
Range	: 106-52
x	: 74.5
s	: 14.9
v(%)	: 19.9

Evaluation

1. Serviceability Performance : 1. Very Good : No distress and smooth comfortable riding surface.
2. Design Adequacy : 2. Adequate .
3. Materials Quality : 3. Adequate dense graded AC mixture .
4. Construction Skills : 4. Adequate .
5. Necessary Measures for Maintenance :

Low-Class Pavement Condition and Distress Survey Report Sheet : No. 14 Survey Date. Dec. 8-23, 1989

Pavement Type
- ☐ GRAVEL
- ☐ SBST
- ☐ DBST
- ☐ BMP
- ☑ AC

Pavement Construction Year: 1978

Location
Province : Cavite
National Road
Trece Martirez to G.M. Alvarez
(EPC Section No. 5)
Station. : 0+030 – 0+100

Traffic Data and Characteristics as of Nov 1989
Both Direction
ADT : 2068
Trucks : 222
Buses : 114

Environmental condition: Grassland area

Drainage condition: Surface drainage : grassy side ditch
Underground water table : Did not noticed

Pavement Existing Condition Rating *
- ☐ Very Good
- ☐ Good
- ☑ Fair
- ☑ Bad
- ☐ Very Bad

* See, Rating Sheet

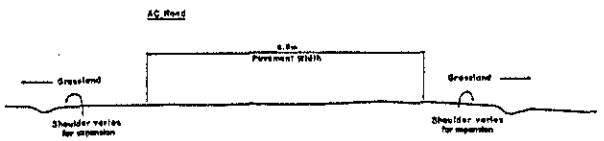
Type of distress, Severity
Cracks of aged surface course and structural failure.

Probable Cause of Distress
Fatigue due to heavy traffic repitition.
Structural thickness is insufficient for these day's heavy traffic.

Maintenance operation: Patching maintenance has almost been conducted and is continued.

Photo showing representative condition

Road Cross Section



Surface Condition

Roughness		R	L
$\bar{x}$	mm :	16.6	14.5
σ	mm :	27.9	17.5
Crack	% :	7.4	7.9
Patching	% :	11.7	7.3
Pothole	% :	–	–
Abrasion	% :	–	–
Depression / Deformation	% :	10.0	5.9
	:	–	–

Pavement Cross Section

	Dense graded
6.5 cm Surface	AC
7.5 cm Base	Crushed stone with silt and clay
11 cm Subbase	Silty sand gravel
Subgrade	Clay silt

Pavement Material Properties

Surface : Rather aged AC mixture because of oxidization of asphalt binder.

Base : Silt – clay contained crushed stone Material
W(n) % Max size mm 37.5 2.0 mm. pass % 43
0.074mm pass %, PI, CBR 14 NP 45.9

Subbase : Sand and silt with gravel Material
W(n) %, Max Size mm 37.5 2.0 mm. pass % 67
0.074 mm pass %, PI CBR 16 NP 11.6

Benkelman Beam Deflection (mm)

n	: 24
Range	: 200–76
x	: 121.4
s	: 34.6
v(%)	: 28.6

Subgrade Soil Properties

Soil Classification MH or CL

W(n)	%	: 32.1
Max. size	mm	: 4.75
0.074 mm pass	%	: 53
	LL	: NP
	PL	: NP
	PI	: NP
	CBR	: 6

Evaluation

1. Serviceability Performance	1. Fair to bad : Cracked and depressed, patched, bumpy riding surface.
2. Design Adequacy	2. Supposedly, the design was adequate at the time of construction.
3. Materials Quality	3. Not bad but not good.
4. Construction Skills	4. Supposedly standard skills at the time of construction.
5. Necessary Measures for Maintenance	5. Partial replacement of pavement, then AC overlay; total rehabilitation program is needed.

Low-Class Pavement Condition and Distress Survey Report Sheet : No. 15 Survey Date. Dec. 8-23, 1989

Pavement Type
- ☐ GRAVEL
- ☐ SBST
- ☐ DBST
- ☐ BMP
- ☑ AC

Pavement Construction Year: 1978

Location
Province : Cavite
National Road
Trece Martirez to G.M. Alvarez
Station. : 0+350 – 0+400

Traffic Data and Characteristics as of Nov. 1989
Both Direction
ADT : 2068
Trucks : 222
Buses : 114

Environmental condition: Grassland area

Drainage condition: Surface drainage : grassy side ditch
Underground water table : Did not noticed

Pavement Existing Condition Rating *
- ☐ Very Good
- ☐ Good
- ☑ Fair
- ☑ Bad
- ☐ Very Bad

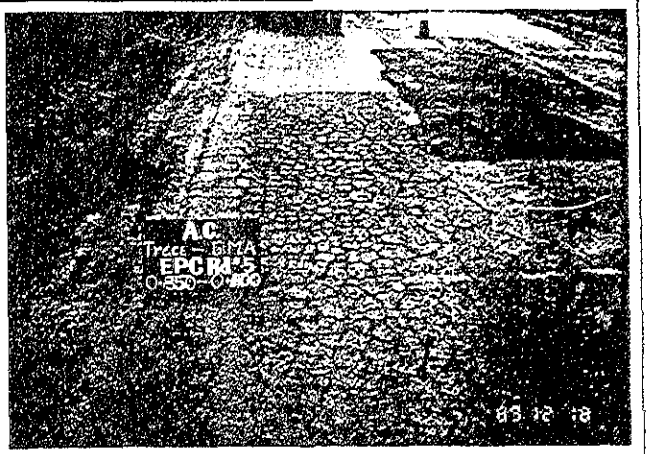
* See, Rating Sheet

Type of distress, Severity
Alligator cracks and depressions are severe, and patched. Bumpy riding surface.
Aged crack.

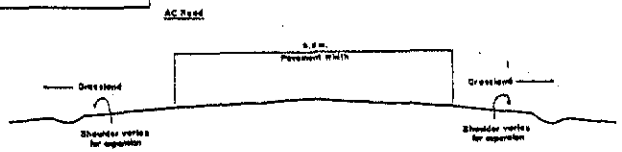
Probable Cause of Distress
Fatigue due to heavy traffic repitition.
Structural thickness is insufficient for these day's traffic condition.
Aged crack due to oxidation of asphalt binder.

Maintenance operation: Patching operation has almost been conducted and is continued.

Photo showing representative condition



Road Cross Section



Surface Condition

Roughness		R	L
$\bar{X}$	mm :	11.9	14.0
σ	mm :	5.8	7.0
Crack	% :	35.0	15.9
Patching	% :	5.7	5.2
Pothole	% :	–	–
Abrasion	% :	–	–
Depression	% :	0	27.6

Pavement Cross Section

8 cm Surface	Dense graded AC
10cm Base	Rock fragment, sand and silt
Subgrade	Sand and silt with pea gravel

Pavement Material Properties
Surface : Rather aged and brittle surface course mixture.

Base : Rather fine grading Material
W(n) % Max size mm 37.5 2.0mm. pass % 47
0.074mm pass %, PI, CBR 16 NP 37.0

Subbase. : Fine grading. Material
W(n) %, Max Size mm 19 2.0 mm. pass % 80
0.074 mm pass %, PI 14 NP CBR 19.6

Benkelman Beam Deflection (mm)
n : 24
Range : 196 – 72
x : 124.8
s : 36.5
v(%) : 29.2

Subgrade Soil Properties
Soil Classification MH or CL
W(n) % : 31.6
Max. size mm : 2.00
0.074 mm pass % : 71
LL : 42
PL : 30
PI : 12
CBR : 5

Evaluation
1. Serviceability Performance
2. Design Adequacy
3. Materials Quality
4. Construction Skills
5. Necessary Measures for Maintenance

1. Fair to Bad: Cracked and depressed, Patched, bumpy riding.
2. Supposedly, the design was adequate at the time of construction.
3. Not bad but not good.
4. Supposedly standard skills at the time of construction.
5. Partial replacement of pavement, then AC overlay ; total rehabilitation program is necessary.

Appendix 8–1

ROAD CONDITION SURVEY RECORDS

Sheet No. 1/8

ROAD CONDITION SURVEY RECORD

Location : JCT. ALFONSO TO MAGALLANES

Province : Cavite Road Classification : Provincial

Experimental Pavement :

Section No. 1 Boring No. 1

Pavement Type

- [ ] Earth
- [x] Gravel
- [ ] DBST
- [ ] BMP
- [ ] AC

Pavement Existing Condition Rating (Visual)

- [ ] Very Good
- [ ] Good
- [ ] Fair
- [x] Bad
- [ ] Very Bad

Gravel surface condition generally bad due to deformation & irregularities of surfacing using soil.

Traffic Data and Characteristics

as of November 1989

AADT 106

Trucks 7

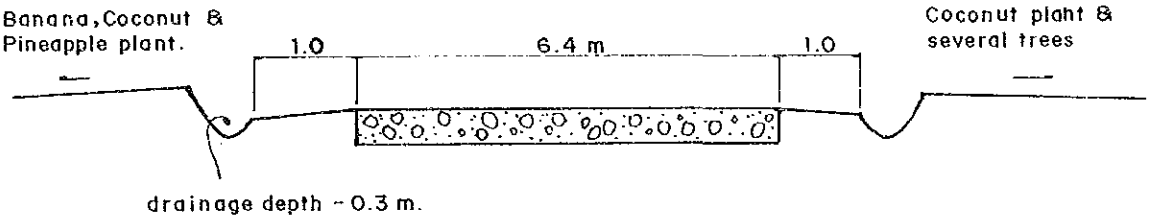
Buses 0

Construction Year

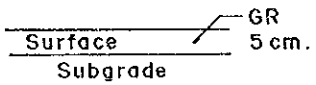
Maintenance History / Operation

Once a year grading operation

Road Cross-Section



Pavement Cross-Section



Environmental Condition

Coconut , Pineapple , Banana plantation & some other different trees.

Drainage Condition

Bad due to insufficient drainage System and grassy side ditch is no longer effective

Subgrade Soil

Soil Classification

W (n)

Max. size	mm	=	37.5
0.075 mm pass	%	=	36
	LL	=	NP
	PL	=	—
	PI	=	NP
Soaked CBR		=	12

Water Table

Did not noticed

Remarks

ROAD CONDITION SURVEY RECORD

Location : JCT. ALFONSO TO MAGALLANES
Province : Cavite Road Classification : Provincial

Experimental Pavement :
Section No. 1 Boring No. 2

Pavement Type

- ☐ Earth
- ☒ Gravel
- ☐ DBST
- ☐ BMP
- ☐ AC

Pavement Existing Condition Rating (Visual)

- ☐ Very Good
- ☐ Good
- ☐ Fair
- ☒ Bad
- ☐ Very Bad

Gravel surface condition bad due to some deformation and irregularities of surfacing

Traffic Data and Characteristics

as of November 1989

AADT 106

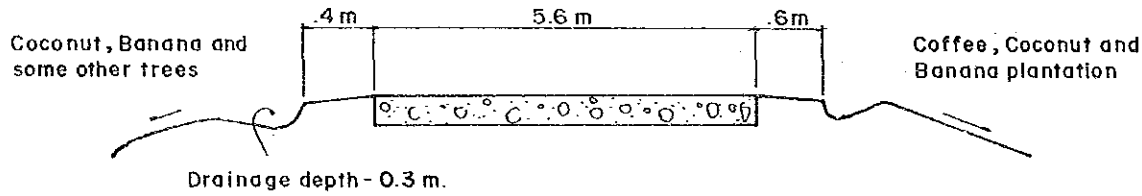
Trucks 7
Buses 0

Construction Year

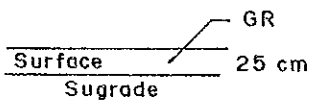
Maintenance History / Operation

Once a year grading operation

Road Cross-Section



Pavement Cross-Section



Environmental Condition

Coffee , Banana & Coconut plantation and some other different trees .
Generally running top of the hill

Drainage Condition

Bad due to no permanent drainage system and grassy.
Side ditch is no longer effective

Subgrade Soil

Soil Classification

W (n)

Max. size	mm	=	12.5
0.075 mm pass	%	=	77
	LL	=	44
	PL	=	33
	PI	=	11
Soaked CBR		=	5

Water Table

Did not noticed

Remarks

ROAD CONDITION SURVEY RECORD

Location : JCT. ALFONSO TO MAGALLANES

Province : Cavite Road Classification : Provincial

Experimental Pavement :

Section No. 1 Boring No. 3

Pavement Type

- ☐ Earth
- ☒ Gravel
- ☐ DBST
- ☐ BMP
- ☐ AC

Pavement Existing Condition Rating (Visual)

- ☐ Very Good
- ☐ Good
- ☐ Fair
- ☒ Bad
- ☐ Very Bad

Surface generally deformed & irregularities of surfacing

Traffic Data and Characteristics

as of November 1989

AADT 106

Trucks 7

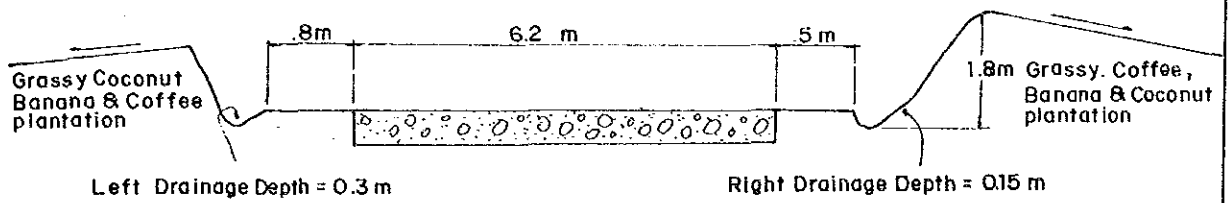
Buses 0

Construction Year

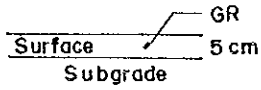
Maintenance History / Operation

Once a year grading operation

Road Cross-Section



Pavement Cross-Section



Environmental Condition

Grassy Coffee, Banana, Coconut plantation, there are also some trees around.

Drainage Condition

Bad due to insuficient drainage system and grassy side ditch is no longer effective

Subgrade Soil

Soil Classification

W(n)

Max. size	mm	= 37.5
0.075 mm pass	%	= 26
	LL	= NP
	PL	= –
	PI	= NP
Soaked CBR		= 19

Water Table

Did not noticed

Remarks

ROAD CONDITION SURVEY RECORD

Location : JCT. ALFONSO TO MAGALLANES

Province : Cavite Road Classification : Provincial

Experimental Pavement :

Section No. 1 Boring No. 4

Pavement Type

- ☐ Earth
- ☒ Gravel
- ☐ DBST
- ☐ BMP
- ☐ AC

Pavement Existing Condition Rating (Visual)

- ☐ Very Good
- ☐ Good
- ☐ Fair
- ☒ Bad
- ☐ Very Bad

Surface condition generally deformed & irregularities in pavement surface

Traffic Data and Characteristics

as of _____

AADT

Trucks

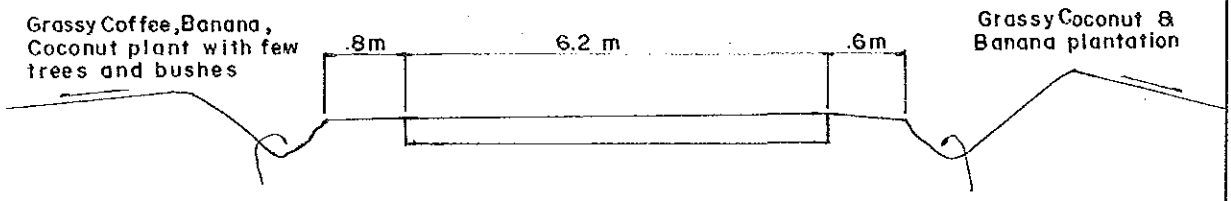
Buses

Construction Year

Maintenance History / Operation

Once a year grading operation

Road Cross-Section



Left Drainage Depth = 0.3 m

Right Drainage Depth = 0.2 m

Pavement Cross-Section

GR

Surface 20 cm

Subgrade

Environmental Condition

Grassy Coffee, Coconut plantation with several trees and bushy areas.

Drainage Condition

Bad due to no permanent drainage system and grassy side ditch is no longer effective

Subgrade Soil

Soil Classification

W (n)

Max. size	mm	=	12.5
0.075 mm pass	%	=	86
	LL	=	64
	PL	=	48
	PI	=	16
Soaked CBR		=	3

Water Table

Did not noticed

Remarks

ROAD CONDITION SURVEY RECORD

Location : JCT. ALFONSO TO MAGALLANES

Province : Cavite Road Classification : Provincial

Experimental Pavement :

Section No. 1 Boring No. 5

Pavement Type

- [ ] Earth
- [X] Gravel
- [ ] DBST
- [ ] BMP
- [ ] AC

Pavement Existing Condition Rating (Visual)

- [ ] Very Good
- [ ] Good
- [ ] Fair
- [X] Bad
- [ ] Very Bad

Surface condition generally deformed & irregularities of surfacing

Traffic Data and Characteristics

as of November 1989

AADT 106

Trucks 7

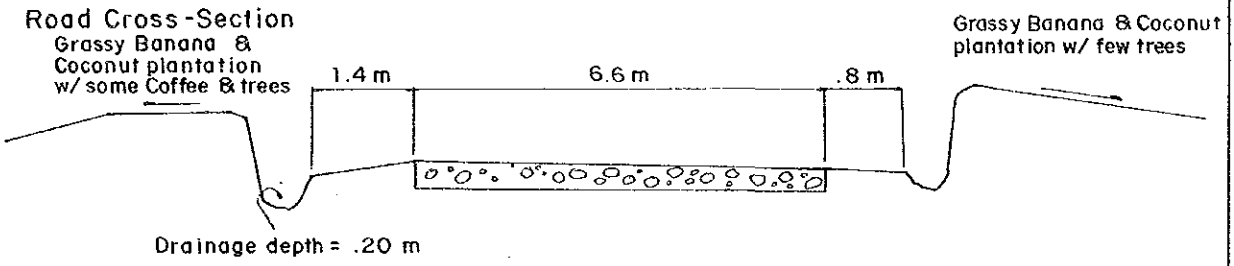
Buses 0

Construction Year

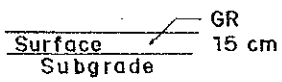
Maintenance History / Operation

Once a year grading operation

Road Cross-Section



Pavement Cross-Section



Environmental Condition

Grassy Banana and Coconut plantation with some trees and bushes.

Drainage Condition

Bad due to no permanent drainage system and grassy side ditch

Subgrade Soil

Soil Classification

W (n)

Max. size	mm	= 37.5
0.075 mm pass	%	= 30
	LL	= NP
	PL	= -
	PI	= NP
Soaked CBR		= 9

Water Table

Did not noticed

Remarks

ROAD CONDITION SURVEY RECORD

Location : JCT. ALFONSO TO MAGALLANES
Province : Cavite Road Classification : Provincial
Experimental Pavement :
Section No. 1 Boring No. 6

Pavement Type

- [ ] Earth
- [X] Gravel
- [ ] DBST
- [ ] BMP
- [ ] AC

Pavement Existing Condition Rating (Visual)

- [ ] Very Good
- [ ] Good
- [ ] Fair
- [X] Bad
- [ ] Very Bad

Surface generally deformed and irregularities of surfacing

Traffic Data and Characteristics

as of November 1989

AADT 106

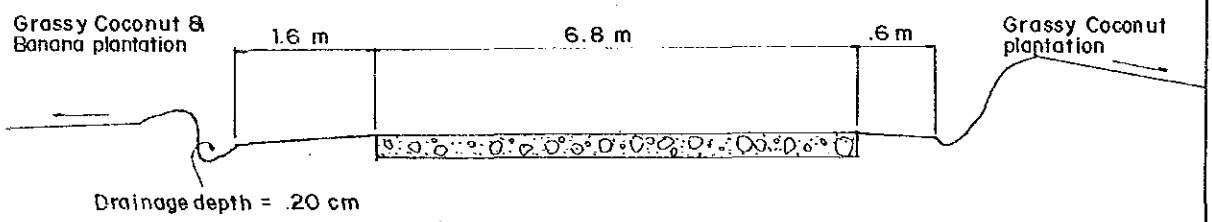
Trucks 7
Buses 0

Construction Year

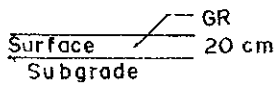
Maintenance History / Operation

Once a year grading operation

Road Cross-Section



Pavement Cross-Section



Environmental Condition

Grassy Coconut & Banana plantation

Drainage Condition

Bad due to insufficient drainage system and grassy side ditch

Subgrade Soil

Soil Classification

W (n)

Max. size	mm	=	9.5
0.075 mm pass	%	=	92
	LL	=	73
	PL	=	48
	PI	=	25
Soaked CBR		=	7

Water Table

Did not noticed

Remarks

ROAD CONDITION SURVEY RECORD

Location : JCT. ALFONSO TO MAGALLANES

Province : Cavite Road Classification : Provincial

Experimental Pavement :

Section No. 1 Boring No. 7

Pavement Type

- ☐ Earth
- ☒ Gravel
- ☐ DBST
- ☐ BMP
- ☐ AC

Pavement Existing Condition Rating (Visual)

- ☐ Very Good
- ☐ Good
- ☐ Fair
- ☒ Bad
- ☐ Very Bad

Surface generally deformed and irregularities of surfacing

Traffic Data and Characteristics

as of November 1989

AADT 106

Trucks 7

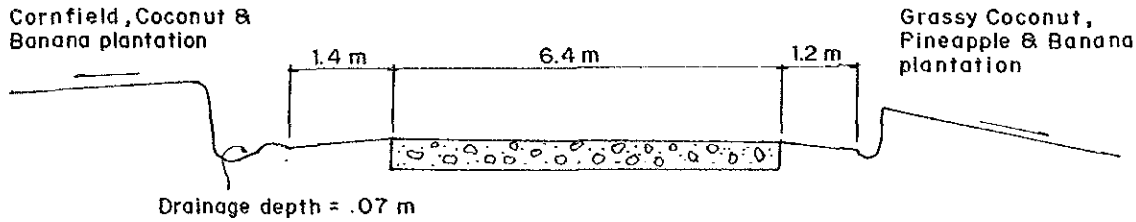
Buses 0

Construction Year

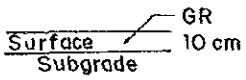
Maintenance History / Operation

Once a year grading operation

Road Cross-Section



Pavement Cross-Section



Environmental Condition

Cornfield & Grassy Banana, and Coconut plantation

Drainage Condition

Bad due to no permanent drainage system and grassy side dicth

Subgrade Soil

Soil Classification

W(n)

Max. size	mm	= 19
0.075 mm pass	%	= 81
	LL	= 73
	PL	= 42
	PI	= 31
Soaked CBR		= 6

Water Table

Did not noticed

Remarks

ROAD CONDITION SURVEY RECORD

Location : JCT. ALFONSO TO MAGALLANES

Province : Cavite Road Classification : Provincial

Experimental Pavement :

Section No. 1 Boring No. 8

Pavement Type

- ☐ Earth
- ☒ Gravel
- ☐ DBST
- ☐ BMP
- ☐ AC

Pavement Existing Condition Rating (Visual)

- ☐ Very Good
- ☐ Good
- ☐ Fair
- ☒ Bad
- ☐ Very Bad

Surface condition generally deformed & irregularities of surfacing

Traffic Data and Characteristics

as of November 1989

AADT 106

Trucks 7

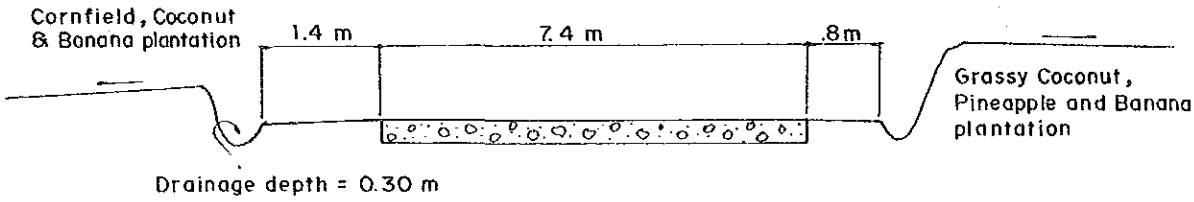
Buses 0

Construction Year

Maintenance History / Operation

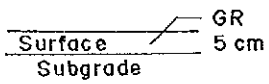
Once a year grading operation

Road Cross-Section



Drainage depth = 0.30 m

Pavement Cross-Section



Environmental Condition

Grassy, bushy Pineapple, Coconut and Banana plantation

Drainage Condition

Bad due to insufficient drainage system and grassy side dicth

Subgrade Soil

Soil Classification

W (n)

Max. size	mm	= 19
0.075 mm pass	%	= 92
	LL	= 76
	PL	= 42
	PI	= 24
Soaked CBR		= 5

Water Table

Did not noticed

Remarks

ROAD CONDITION SURVEY RECORD

Location : MARAGONDON TO MAGALLANES
Province : Cavite Road Classification : Provincial
Experimental Pavement :
Section No. 2 Boring No. 1

Pavement Type

- [ ] Earth
- [x] Gravel
- [ ] DBST
- [ ] BMP
- [ ] AC

Pavement Existing Condition Rating (Visual)

- [ ] Very Good
- [ ] Good
- [x] Fair
- [x] Bad
- [ ] Very Bad

Gravel surface condition generally deformed and irregularities of surfacing using cobbles

Traffic Data and Characteristics

as of November 1989

AADT 80

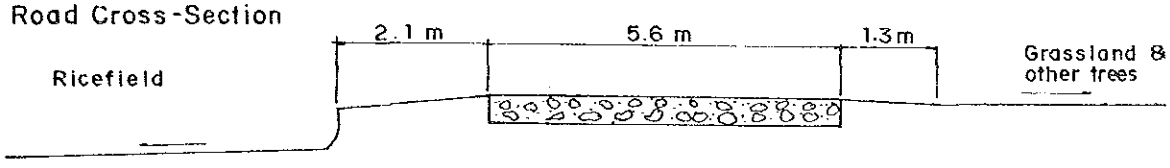
Trucks 5
Buses 0

Construction Year

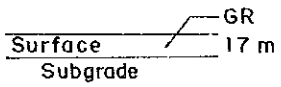
Maintenance History / Operation

Once a year grading operation

Road Cross-Section



Pavement Cross-Section



Environmental Condition

Ricefield at left side
Grassland at right side w/ some different trees like mango

Drainage Condition

Bad due to no permanent drainage system

Subgrade Soil

Soil Classification

W (n)

Max. size	mm	= 25
0.075 mm pass	%	= 64
	LL	= 52
	PL	= 32
	PI	= 20
Soaked CBR		= 4

Water Table

Did not noticed

Remarks

ROAD CONDITION SURVEY RECORD

Location : MARAGONDON TO MAGALLANES

Province : Cavite Road Classification : Provincial

Experimental Pavement :

Section No. 2 Boring No. 2

Pavement Type

- ☐ Earth
- ☒ Gravel
- ☐ DBST
- ☐ BMP
- ☐ AC

Pavement Existing Condition Rating (Visual)

- ☐ Very Good
- ☐ Good
- ☐ Fair
- ☒ Bad to Fair
- ☐ Very Bad

Gravel surface condition generally in good condition

Traffic Data and Characteristics

as of November 1989

AADT 80

Trucks 5

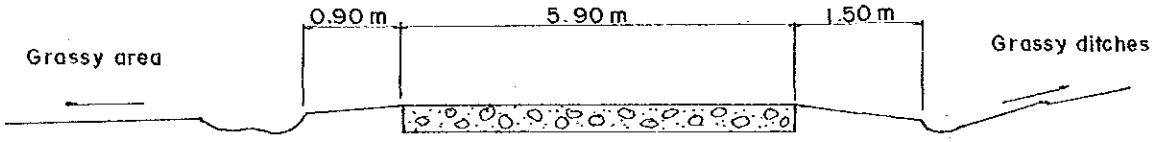
Buses 0

Construction Year

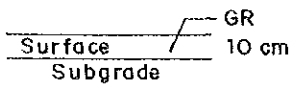
Maintenance History / Operation

Once a year grading operation

Road Cross-Section



Pavement Cross-Section



Environmental Condition

Grassland @ both side w/ Mango trees & other trees like young Coconut

Drainage Condition

Bad due to grassy side ditch is no longer effective

Subgrade Soil

Soil Classification

W (n)

Max. size	mm	=	19
0.075 mm pass	%	=	24
	LL	=	NP
	PL	=	–
	PI	=	NP
Soaked CBR		=	15

Water Table

Did not noticed

Remarks

ROAD CONDITION SURVEY RECORD

Location : MARAGONDON TO MAGALLANES

Province : Cavite Road Classification : Provincial

Experimental Pavement :

Section No. 2 Boring No. 3

Pavement Type

- ☐ Earth
- ☒ Gravel
- ☐ DBST
- ☐ BMP
- ☐ AC

Pavement Existing Condition Rating (Visual)

- ☐ Very Good
- ☒ Good
- ☐ Fair
- ☐ Bad
- ☐ Very Bad

Gravel surface condition generally in good condition

Traffic Data and Characteristics

as of November 1989

AADT 80

Trucks 5

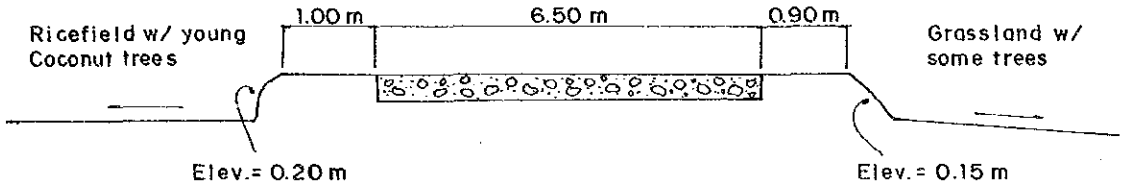
Buses 0

Construction Year

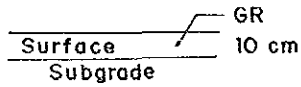
Maintenance History / Operation

Once a year grading operation

Road Cross-Section



Pavement Cross-Section



Environmental Condition

Grassland & Ricefield w/ some young Coconut trees

Drainage Condition

Bad due to no permanent drainage system

Subgrade Soil

Soil Classification

W(n)

Max. size	mm	= 19
0.075 mm pass	%	= 75
	LL	= 58
	PL	= 32
	PI	= 26
Soaked CBR		= 2

Water Table

Did not noticed

Remarks

ROAD CONDITION SURVEY RECORD

Location : MARAGONDON TO MAGALLANES

Province : Cavite Road Classification : Provincial

Experimental Pavement :

Section No. 2 Boring No. 4

Pavement Type

- [ ] Earth
- [X] Gravel
- [ ] DBST
- [ ] BMP
- [ ] AC

Pavement Existing Condition Rating (Visual)

- [ ] Very Good
- [ ] Good
- [X] Fair
- [X] Bad
- [ ] Very Bad

Gravel surface condition has already some potholes

Traffic Data and Characteristics

as of November 1989

AADT 80

Trucks 5

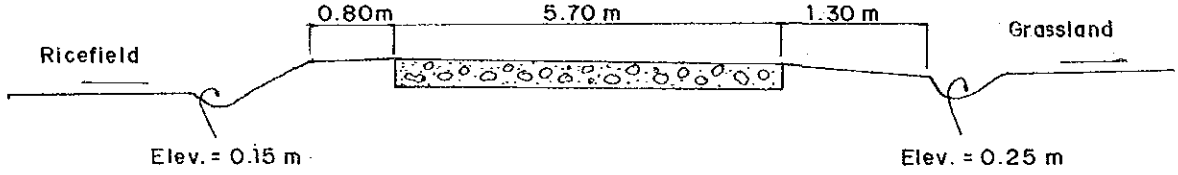
Buses 0

Construction Year

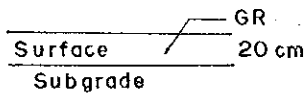
Maintenance History / Operation

Once a year grading operation

Road Cross-Section



Pavement Cross-Section



Environmental Condition

Grassland w/ some Mango, Bamboo & Banana trees

Drainage Condition

No permanent drainage sytem

Bad

Subgrade Soil

Soil Classification

W (n)

Max. size	mm	= 19
0.075 mm pass	%	= 65
	LL	= 47
	PL	= 30
	PI	= 17
Soaked CBR		= 10

Water Table

Did not noticed

Remarks

ROAD CONDITION SURVEY RECORD

Location : MARAGONDON TO MAGALLANES

Province : Cavite Road Classification : Provincial

Experimental Pavement :

Section No. 2 Boring No. 5

Pavement Type

- ☐ Earth
- ☐ Gravel
- ☐ DBST
- ☐ BMP
- ☐ AC

Pavement Existing Condition Rating (Visual)

- ☐ Very Good
- ☐ Good
- ☒ Fair
- ☒ Bad
- ☐ Very Bad

Deformation on some portion of pavement

Traffic Data and Characteristics

as of November 1989

AADT 80

Trucks 5

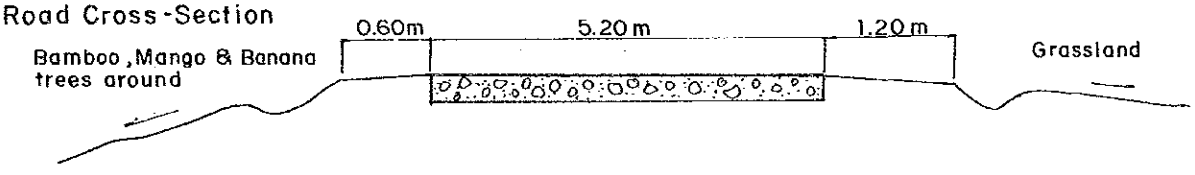
Buses 0

Construction Year

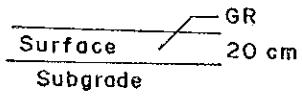
Maintenance History / Operation

Once a year grading operation

Road Cross-Section



Pavement Cross-Section



Environmental Condition

Grassland w/ some trees like Mango, Bamboo & Banana

Drainage Condition

No permanent drainage system

Bad

Subgrade Soil

Soil Classification

W (n)

Max. size	mm	=	12.5
0.075 mm pass	%	=	71
	LL	=	42
	PL	=	28
	PI	=	14
Soaked CBR		=	11

Water Table

Did not noticed

Remarks

ROAD CONDITION SURVEY RECORD

Location : MARAGONDON TO MAGALLANES

Province : Cavite Road Classification : Provincial

Experimental Pavement :

Section No. 2 Boring No. 6

Pavement Type

- ☐ Earth
- ☒ Gravel
- ☐ DBST
- ☐ BMP
- ☐ AC

Pavement Existing Condition Rating (Visual)

- ☐ Very Good
- ☐ Good
- ☐ Fair
- ☒ Bad
- ☐ Very Bad

Some deppression & deformation observed

Traffic Data and Characteristics

as of November 1989

AADT 80

Trucks 5

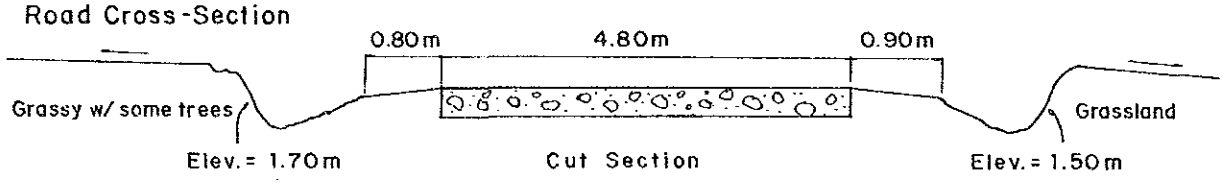
Buses 0

Construction Year

Maintenance History / Operation

Once a year grading operation

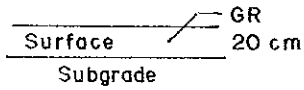
Road Cross-Section



Left drainage elev. = 0.30 m

Right drainage elev. = 0.25 m

Pavement Cross-Section



Environmental Condition

Grassland w/ some trees like Bamboo, Mango etc

Drainage Condition

Bad, no permanent drainage system and grassy side ditch

Subgrade Soil

Soil Classification

W (n)

Max. size	mm	=	12.5
0.075 mm pass	%	=	67
	LL	=	42
	PL	=	26
	PI	=	16
Soaked CBR		=	3

Water Table

Did not noticed

Remarks

ROAD CONDITION SURVEY RECORD

Location : MARAGONDON TO MAGALLANES

Province : Cavite Road Classification : Provincial

Experimental Pavement :

Section No. 2 Boring No. 7

Pavement Type

- [ ] Earth
- [X] Gravel
- [ ] DBST
- [ ] BMP
- [ ] AC

Pavement Existing Condition Rating (Visual)

- [ ] Very Good
- [ ] Good
- [ ] Fair
- [X] Bad
- [ ] Very Bad

Gravel surface condition generally bad due to deformation and irregularities of surfacing using cobbles.

Traffic Data and Characteristics

as of November 1989

AADT 80

Trucks 5

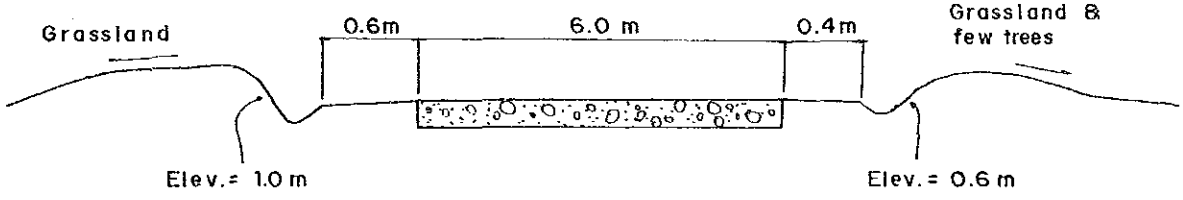
Buses 0

Construction Year

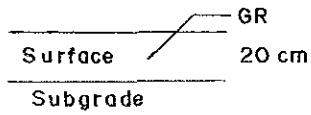
Maintenance History / Operation

Once a year grading operation

Road Cross-Section



Pavement Cross-Section



Environmental Condition

- Both side is idle grassy land with few trees
- Cut Section

Drainage Condition

- Bad due to insufficient drainage system and grassy side ditch

Subgrade Soil

Soil Classification

W(n)

Max. size	mm	= 19
0.075 mm pass	%	= 53
	LL	= 56
	PL	= 36
	PI	= 20
Soaked CBR		= 10

Water Table

Noticed 1.1 m depth

Remarks

110 cm depth may be a sign of water table

ROAD CONDITION SURVEY RECORD

Location : MARAGONDON TO MAGALLANES
Province : Cavite Road Classification : Provincial
Experimental Pavement :
Section No. 2 Boring No. 8

Pavement Type

- [ ] Earth
- [x] Gravel
- [ ] DBST
- [ ] BMP
- [ ] AC

Pavement Existing Condition Rating (Visual)

- [ ] Very Good
- [ ] Good
- [ ] Fair
- [x] Bad
- [ ] Very Bad

Gravel surface condition - observed some deformation & irregularities of surfacing using cobbles

Traffic Data and Characteristics

as of November 1989

AADT 80

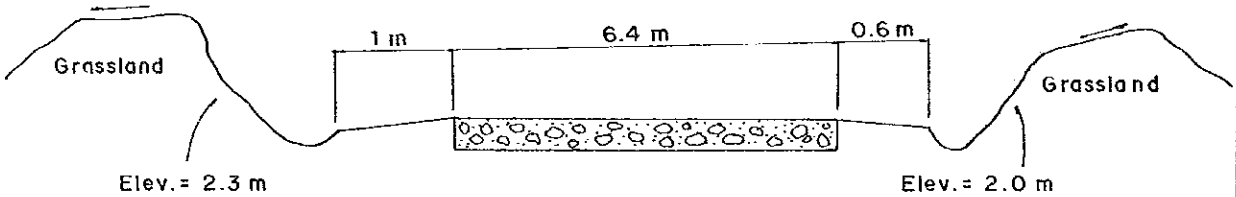
Trucks 5
Buses 0

Construction Year

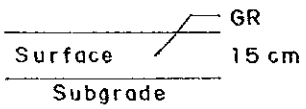
Maintenance History / Operation

Once a year grading operation

Road Cross-Section



Pavement Cross-Section



Environmental Condition

Both side is idle grassland with few trees.
Cut Section

Drainage Condition

Bad due to insufficient drainage system and grassy side ditch

Subgrade Soil

Soil Classification

W (n)

Max. size	mm	=	19
0.075 mm pass	%	=	66
	LL	=	NP
	PL	=	—
	PI	=	NP
Soaked CBR		=	2

Water Table

Remarks

ROAD CONDITION SURVEY RECORD

Location : GEN. TRIAS TO AMADEO

Province : Cavite Road Classification : Provincial

Experimental Pavement :

Section No. 3 Boring No. 1

Pavement Type

- [ ] Earth
- [ ] Gravel
- [X] DBST
- [ ] BMP
- [ ] AC

Pavement Existing Condition Rating (Visual)

- [ ] Very Good
- [ ] Good
- [X] Fair
- [X] Bad
- [ ] Very Bad

Surface condition has some alligator cracks, ravelling and potholes due to structural failure

Traffic Data and Characteristics

as of November 1989

AADT 654

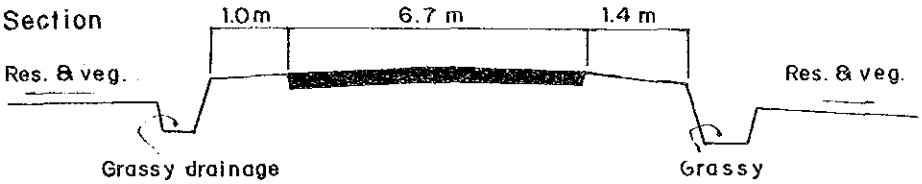
Trucks 37

Buses 2

Construction Year

Maintenance History / Operation

Road Cross-Section



Left Drainage Depth = 0.70 m

Right Drainage Depth = 0.75 m

Pavement Cross-Section

Surface — DBST 16 mm

Base — 25 cm

Subgrade

Environmental Condition

Both side residential and vegetated ; Fill section

Drainage Condition

Bad due to grassy side ditch is no longer effective

Subgrade Soil

Soil Classification

W(n)

Max. size	mm	=	37.5
0.075 mm pass	%	=	53
	LL	=	51
	PL	=	39
	PI	=	12
Soaked CBR		=	3

Water Table

Did not noticed

Remarks

ROAD CONDITION SURVEY RECORD

Location : GEN. TRIAS TO AMADEO

Province : Cavite Road Classification : Provincial

Experimental Pavement :

Section No. 3 Boring No. 2

Pavement Type

- ☐ Earth
- ☐ Gravel
- ☒ DBST
- ☐ BMP
- ☐ AC

Pavement Existing Condition Rating (Visual)

- ☐ Very Good
- ☐ Good
- ☒ Fair
- ☐ Bad
- ☐ Very Bad

Surface condition has some aligator cracks , ravelling and potholes due structural failure

Traffic Data and Characteristics

as of November 1989

AADT 654

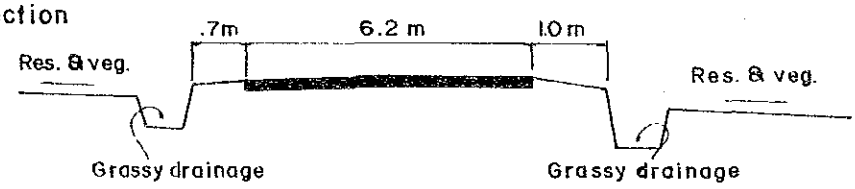
Trucks 37

Buses 2

Construction Year

Maintenance History / Operation

Road Cross-Section



Left Drainage Depth = 0.40 m

Right Drainage Depth = 0.50 m

Pavement Cross-Section

Surface — DBST 16 mm

Base 25 cm

Subgrade

Environmental Condition

Both sides residential and vegetated

Drainage Condition

Bad due to grassy side ditch is no longer effective

Subgrade Soil

Soil Classification

W (n)

Max. size	mm	= 37.5
0.075 mm pass	%	= 43
	LL	= NP
	PL	= -
	PI	= NP
Soaked CBR		= 8

Water Table

Did not noticed

Remarks

ROAD CONDITION SURVEY RECORD

Location : GEN. TRIAS TO AMADEO

Province : Cavite Road Classification : Provincial

Experimental Pavement :

Section No. 3 Boring No. 3

Pavement Type

- ☐ Earth
- ☐ Gravel
- ☒ DBST
- ☐ BMP
- ☐ AC

Pavement Existing Condition Rating (Visual)

- ☐ Very Good
- ☐ Good
- ☒ Fair
- ☐ Bad
- ☐ Very Bad

Surface condition has some ravelling and potholes

Traffic Data and Characteristics

as of November 1989

AADT 654

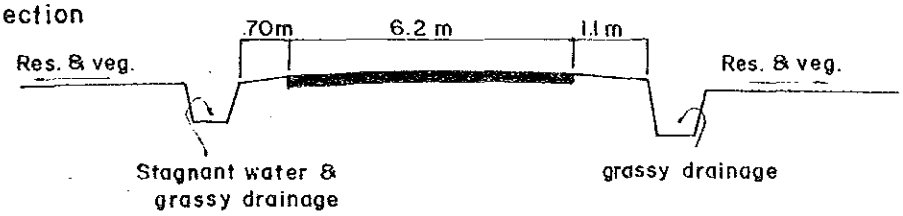
Trucks 37

Buses 2

Construction Year

Maintenance History / Operation

Road Cross-Section



Left Drainage Depth = 0.30

Right Drainage Depth = 0.50 m

Pavement Cross-Section

Surface — DBST 16 mm

Base 30 cm

Subgrade

Environmental Condition

Both sides residential and vegetated ; Fill section

Drainage Condition

Bad due to stagnant water and poor grassy open ditch is no longer effective

Subgrade Soil

Soil Classification

W (n)

Max. size	mm	=	37.5
0.075 mm pass	%	=	30
	LL	=	NP
	PL	=	-
	PI	=	NP
Soaked CBR		=	4

Water Table

Did not noticed

Remarks

ROAD CONDITION SURVEY RECORD

Location : GEN. TRIAS TO AMADEO

Province : Cavite Road Classification : Provincial

Experimental Pavement :

Section No. 3 Boring No. 4

Pavement Type

- ☐ Earth
- ☐ Gravel
- ☒ DBST
- ☐ BMP
- ☐ AC

Pavement Existing Condition Rating (Visual)

- ☐ Very Good
- ☐ Good
- ☒ Fair
- ☐ Bad
- ☐ Very Bad

Surface condition has some aligator cracks, ravelling and potholes due to structural failure

Traffic Data and Characteristics

as of November 1989

AADT 654

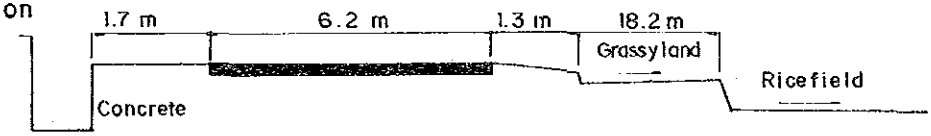
Trucks 37

Buses 2

Construction Year

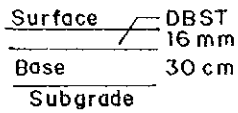
Maintenance History / Operation

Road Cross-Section



Left Drainage Depth = 0.70 m

Pavement Cross-Section



Environmental Condition

Ricefield is on Right side and Left side is elementary school

Fill section

Drainage Condition

Fair due to effective drainage system

Water Table

Did not noticed

Remarks

Subgrade Soil

Soil Classification

W(n)

Max. size	mm	=	37.5
0.075 mm pass	%	=	44
	LL	=	52
	PL	=	31
	PI	=	21
Soaked CBR		=	4

ROAD CONDITION SURVEY RECORD

Location : GEN. TRIAS TO AMADEO

Province : Cavite Road Classification : Provincial

Experimental Pavement :

Section No. 3 Boring No. 5

Pavement Type

- ☐ Earth
- ☐ Gravel
- ☒ DBST
- ☐ BMP
- ☐ AC

Pavement Existing Condition Rating (Visual)

- ☐ Very Good
- ☐ Good
- ☒ Fair
- ☐ Bad
- ☐ Very Bad

Surface condition distress due to asphalt spray streaking

Traffic Data and Characteristics

as of November 1989

AADT 654

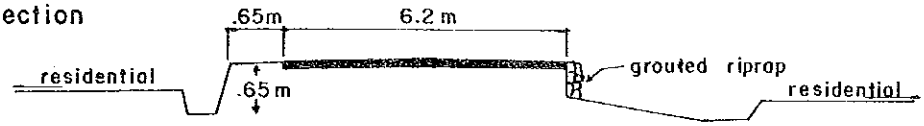
Trucks 37

Buses 2

Construction Year

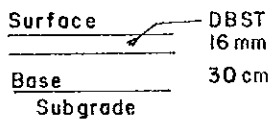
Maintenance History / Operation

Road Cross-Section



Left Drainage Depth = 0.65 m

Pavement Cross-Section



Environmental Condition

Both sides residential ;
Fill section

Drainage Condition

Fair due to effective drainage system

Subgrade Soil

Soil Classification

W (n)

Max. size	mm	= 19
0.075 mm pass	%	= 59
	LL	= 44
	PL	= 30
	PI	= 14
Soaked CBR		= 10

Water Table

Did not noticed

Remarks

Sheet No. 6/8

ROAD CONDITION SURVEY RECORD

Location : GEN. TRIAS TO AMADEO

Province : Cavite Road Classification : Provincial

Experimental Pavement :

Section No. 3 Boring No. 6

Pavement Type

- [ ] Earth
- [ ] Gravel
- [x] DBST
- [ ] BMP
- [ ] AC

Pavement Existing Condition Rating (Visual)

- [ ] Very Good
- [ ] Good
- [x] Fair
- [ ] Bad
- [ ] Very Bad

Surface condition distness due to asphalt spray streaking

Traffic Data and Characteristics

as of November 1989

AADT 654

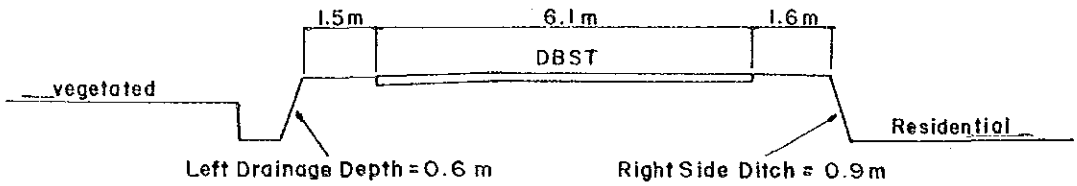
Trucks 37

Buses 2

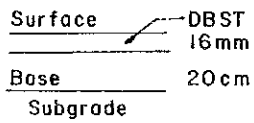
Construction Year

Maintenance History / Operation

Road Cross-Section



Pavement Cross-Section



Environmental Condition

Both sides residential & vegetated

Drainage Condition

Fair due to effective drainage system

Subgrade Soil

Soil Classification

W(n)

Max. size	mm	= 37.5
0.075 mm pass	%	= 24
	LL	= NP
	PL	= —
	PI	= NP
Soaked CBR		= 7

Water Table

Did not noticed

Remarks

ROAD CONDITION SURVEY RECORD

Location : GEN. TRIAS TO AMADEO

Province : Cavite Road Classification : Provincial

Experimental Pavement :

Section No. 3 Boring No. 7

Pavement Type

- ☐ Earth
- ☐ Gravel
- ☒ DBST
- ☐ BMP
- ☐ AC

Pavement Existing Condition Rating (Visual)

- ☐ Very Good
- ☐ Good
- ☒ Fair
- ☐ Bad
- ☐ Very Bad

Surface condition distness due to asphalt spray streaking

Traffic Data and Characteristics

as of November 1989

AADT 654

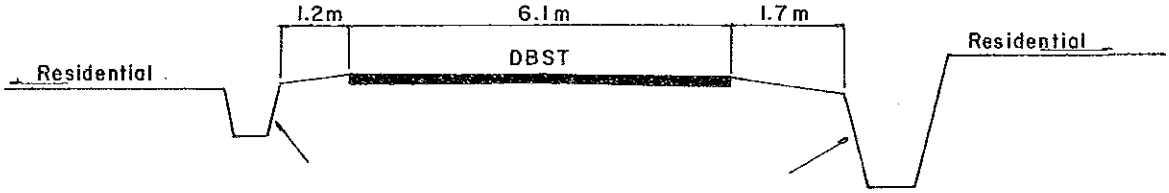
Trucks 37

Buses 2

Construction Year

Maintenance History / Operation

Road Cross-Section



Left Drainage Depth = .33 m

Right Drainage Depth = 1.5 m

Pavement Cross-Section

Surface — DBST 16mm

Base — 25 cm

Subgrade

Environmental Condition

Both sides residential;
Fill section; Flat terrain

Drainage Condition

Fair due to effective drainage system

Subgrade Soil

Soil Classification

W(n)

Max. size	mm	= 37.5
0.075 mm pass	%	= 22
	LL	= NP
	PL	= —
	PI	= NP
Soaked CBR		= 68

Water Table

Did not noticed

Remarks

ROAD CONDITION SURVEY RECORD

Location : GEN. TRIAS TO AMADEO

Province : Cavite Road Classification : Provincial

Experimental Pavement :

Section No. 3 Boring No. 8

Pavement Type

- [ ] Earth
- [ ] Gravel
- [X] DBST
- [ ] BMP
- [ ] AC

Pavement Existing Condition Rating (Visual)

- [ ] Very Good
- [ ] Good
- [X] Fair
- [X] Bad
- [ ] Very Bad

Surface condition has some aligator cracks

Traffic Data and Characteristics

as of November 1989

AADT 654

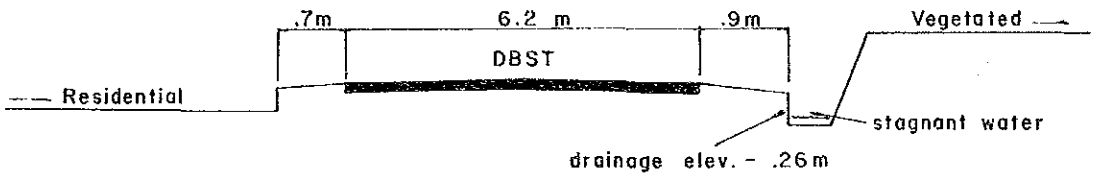
Trucks 37

Buses 2

Construction Year

Maintenance History / Operation

Road Cross-Section



Pavement Cross-Section

Surface — DBST 16 mm

Base — 25 mm

Subgrade

Environmental Condition

Left side toward Jct. T. Martires — residential

Right side — vegetated

Drainage Condition

Bad due to stagnant water and grassy open ditch is no longer effective

Subgrade Soil

Soil Classification

W (n)

Max. size	mm	= 37.5
0.075 mm pass	%	= 29
	LL	= NP
	PL	= —
	PI	= NP
Soaked CBR		= 17

Water Table

Did not noticed

Remarks

ROAD CONDITION SURVEY RECORD

Location : GEN. TRIAS TO AMADEO

Province : Cavite Road Classification : Provincial

Experimental Pavement :

Section No. 4 Boring No. 1

Pavement Type

- ☐ Earth
- ☐ Gravel
- ☒ DBST
- ☐ BMP
- ☐ AC

Pavement Existing Condition Rating (Visual)

- ☐ Very Good
- ☐ Good
- ☒ Fair
- ☐ Bad
- ☐ Very Bad

Surface condition has some potholes and aligator cracks and ravelling

Traffic Data and Characteristics

as of November 1989

AADT 654

Trucks 37

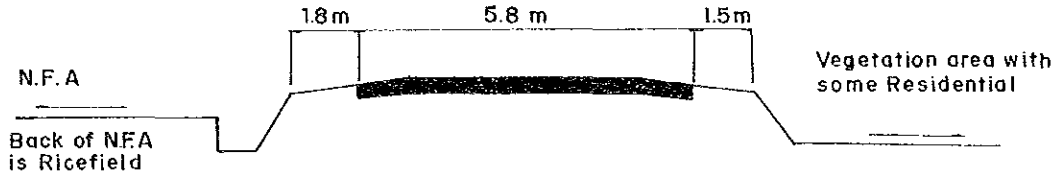
Buses 2

Construction Year

Maintenance History / Operation

Pothole patching of crushed aggregate

Road Cross-Section



Pavement Cross-Section

Surface — DBST 16 mm

Base 20 cm

Subgrade

Environmental Condition

Left side - N.F.A

Right side - Vegetated with some Residential

Drainage Condition

Bad due to grassy side ditch is no longer effective

Subgrade Soil

Soil Classification

W (n)

Max. size	mm	=	37.5
0.075 mm pass	%	=	28
	LL	=	NP
	PL	=	—
	PI	=	NP
Soaked CBR		=	12

Water Table

Did not noticed

Remarks

ROAD CONDITION SURVEY RECORD

Location : GEN.TRIAS TO AMADEO

Province : Cavite Road Classification : Provincial

Experimental Pavement :

Section No. 4 Boring No. 2

Pavement Type

- [ ] Earth
- [ ] Gravel
- [x] DBST
- [ ] BMP
- [ ] AC

Pavement Existing Condition Rating (Visual)

- [ ] Very Good
- [ ] Good
- [x] Fair
- [ ] Bad
- [ ] Very Bad

Surface condition has some potholes, aligator cracks and ravelling

Traffic Data and Characteristics

as of November 1989

AADT 654

Trucks 37

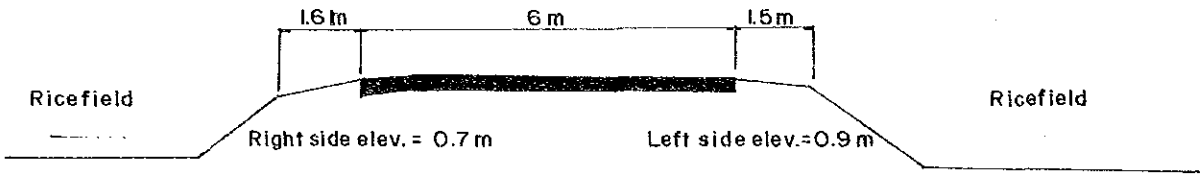
Buses 2

Construction Year

Maintenance History / Operation

Pothole patching of crushed aggregate

Road Cross-Section



Pavement Cross-Section

Surface — DBST 16 mm

Base — 12 cm

Subgrade

Environmental Condition

Ricefield both side
Fill section

Drainage Condition

Bad due to grassy side ditch is no longer effective

Subgrade Soil

Soil Classification

W (n)

Max. size	mm	=	19
0.075 mm pass	%	=	43
	LL	=	NP
	PL	=	—
	PI	=	NP
Soaked CBR		=	11

Water Table

Did not noticed

Remarks

Water at ricefield rise about 40 cm during rainy season

ROAD CONDITION SURVEY RECORD

Location : GEN. TRIAS TO AMADEO

Province : Cavite Road Classification : Provincial

Experimental Pavement :

Section No. 4 Boring No. 3

Pavement Type

- ☐ Earth
- ☐ Gravel
- ☒ DBST
- ☐ BMP
- ☐ AC

Pavement Existing Condition Rating (Visual)

- ☐ Very Good
- ☐ Good
- ☒ Fair
- ☐ Bad
- ☐ Very Bad

Surface condition has some aligator cracks and ravelling

Traffic Data and Characteristics

as of November 1989

AADT 654

Trucks 37

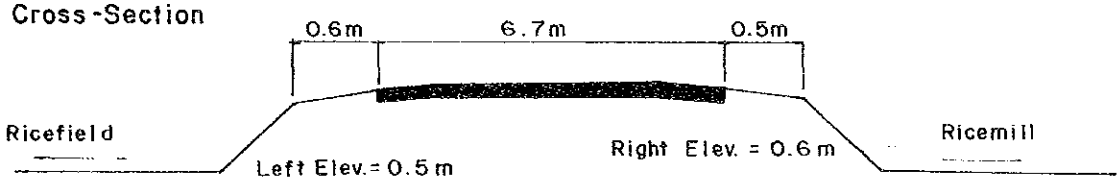
Buses 2

Construction Year

Maintenance History / Operation

Pathole patching of crushed aggregate

Road Cross-Section



Pavement Cross-Section

Surface — DBST 16 mm

Base — 12 cm

Subgrade

Environmental Condition

Ricefield at the left side & Ricemill at the right side with several trees around

Drainage Condition

Bad due to grassy side ditch is no longer effective also ricefield almost level to the subbase

Subgrade Soil

Soil Classification

W(n)

Max. size	mm	= 37.5
0.075 mm pass	%	= 44
	LL	= 40
	PL	= .25
	PI	= 15
Soaked CBR		= 8

Water Table

Did not noticed

Remarks

ROAD CONDITION SURVEY RECORD

Location : GEN. TRIAS TO AMADEO

Province : Cavite Road Classification : Provincial

Experimental Pavement :

Section No. 4 Boring No. 4

Pavement Type

- ☐ Earth
- ☐ Gravel
- ☒ DBST
- ☐ BMP
- ☐ AC

Pavement Existing Condition Rating (Visual)

- ☐ Very Good
- ☐ Good
- ☒ Fair
- ☒ Bad
- ☐ Very Bad

Surface condition has some aligator cracks due to structural failure.

Traffic Data and Characteristics

as of November 1989

AADT 654

Trucks 37

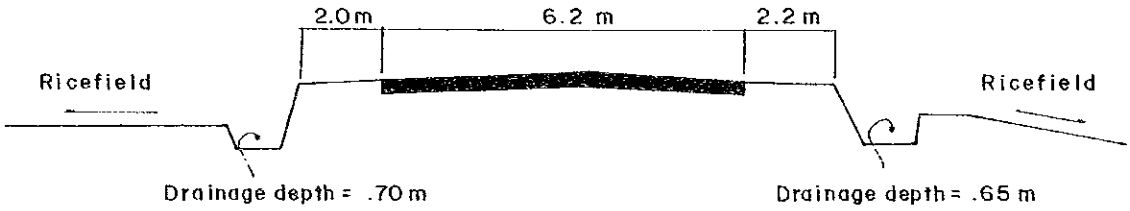
Buses 2

Construction Year

Maintenance History / Operation

Pothole patching of crushed aggregate

Road Cross-Section



Pavement Cross-Section

Surface — DBST 16 mm

Base — 40 cm

Subgrade

Environmental Condition

Both side ricefield

Areas : Flat terrain

Drainage Condition

- Bad due to grassy side ditch is nolonger effective also
- ricefield almost level to the surface

Subgrade Soil

Soil Classification

W (n)

Max. size	mm	= 19
0.075 mm pass	%	= 60
	LL	= 51
	PL	= 30
	PI	= 21
Soaked CBR		= 5

Water Table

- Did not noticed

Remarks

Surfacing is already deteriorated

ROAD CONDITION SURVEY RECORD

Location : GEN. TRIAS TO AMADEO

Province : Cavite Road Classification : Provincial

Experimental Pavement :

Section No. 4 Boring No. 5

Pavement Type

- ☐ Earth
- ☐ Gravel
- ☒ DBST
- ☐ BMP
- ☐ AC

Pavement Existing Condition Rating (Visual)

- ☐ Very Good
- ☐ Good
- ☒ Fair
- ☒ Bad
- ☐ Very Bad

Surface condition has some aligator cracks and deformation due to structural failure ; Deflection are observed when trucks and loaded jeepneys are passes by.

Traffic Data and Characteristics

as of November 1989

AADT 654

Trucks 37

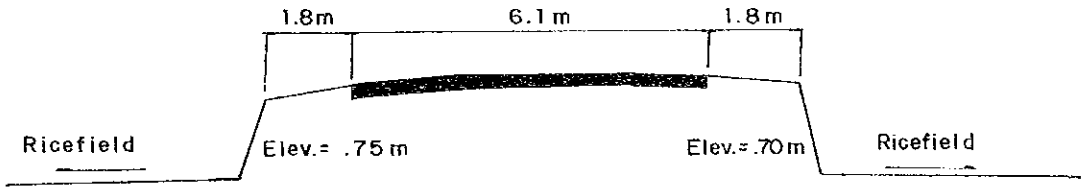
Buses 2

Construction Year

Maintenance History / Operation

Pothole patching of crushed aggregate

Road Cross-Section



Pavement Cross-Section

Surface	DBST 16 mm
Base	20 cm
Subgrade	

Environmental Condition

Both side ricefield
Flat terrain ; Fill section

Drainage Condition

Bad due to grassy side ditch is no longer effective

Subgrade Soil

Soil Classification

W(n)

Max. size	mm	= 19
0.075 mm pass	%	= 36
	LL	= NP
	PL	= -
	PI	= NP
Soaked CBR		= 3

Water Table

Did not noticed

Remarks

ROAD CONDITION SURVEY RECORD

Location : GEN. TRIAS TO AMADEO
Province : Cavite Road Classification : Provincial
Experimental Pavement :
Section No. 4 Boring No. 6

Pavement Type

- ☐ Earth
- ☐ Gravel
- ☒ DBST
- ☐ BMP
- ☐ AC

Pavement Existing Condition Rating (Visual)

- ☐ Very Good
- ☐ Good
- ☐ Fair
- ☒ Bad
- ☐ Very Bad

Surface condition has some cracks and potholes due to structural failure

Traffic Data and Characteristics

as of November 1989

AADT 654

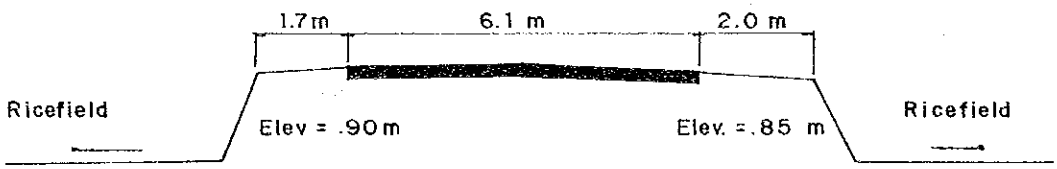
Trucks 37
Buses 2

Construction Year

Maintenance History / Operation

Pothole patching of crushed aggregates

Road Cross-Section



Pavement Cross-Section

Surface	DBST
	16 mm
Base	25 cm
Subgrade	

Environmental Condition

Both side ricefield
Flat terrain ; Fill section

Drainage Condition

Bad due to grassy side ditch is no longer effective

Subgrade Soil

Soil Classification

W(n)

Max. size	mm	= 37.5
0.075 mm pass	%	= 26
	LL	= NP
	PL	= —
	PI	= NP
Soaked CBR		= 14

Water Table

Did not noticed

Remarks

ROAD CONDITION SURVEY RECORD

Location : GEN. TRIAS TO AMADEO

Province : Cavite Road Classification : Provincial

Experimental Pavement :

Section No. 4 Boring No. 7

Pavement Type

- ☐ Earth
- ☐ Gravel
- ☒ DBST
- ☐ BMP
- ☐ AC

Pavement Existing Condition Rating (Visual)

- ☐ Very Good
- ☐ Good
- ☐ Fair
- ☒ Bad
- ☐ Very Bad

Surface condition has some aligator cracks, potholes and deformation due to structural failure.

Traffic Data and Characteristics

as of November 1989

AADT 654

Trucks 37

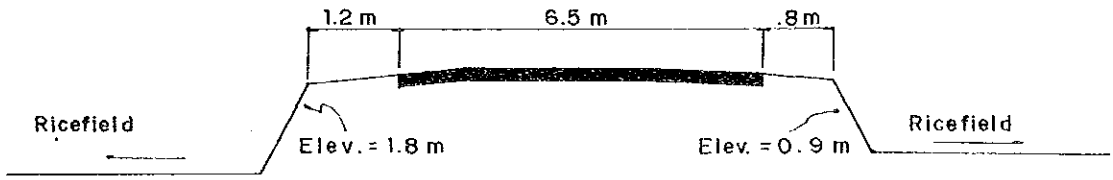
Buses 2

Construction Year

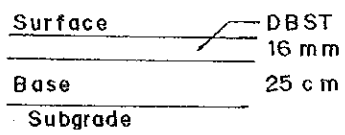
Maintenance History / Operation

Pothole patching of crushed aggregate

Road Cross-Section



Pavement Cross-Section



Environmental Condition

Both side ricefield
Filled section; Flat terrain

Drainage Condition

Bad due to grassy side ditch is no longer effective

Subgrade Soil

Soil Classification

W(n)

Max. size	mm	= 19
0.075 mm pass	%	= 59
	LL	= 42
	PL	= 27
	PI	= 15
Soaked CBR		= 5

Water Table

Did not noticed

Remarks

ROAD CONDITION SURVEY RECORD

Location : GEN. TRIAS TO AMADEO
Province : Cavite Road Classification : Provincial
Experimental Pavement :
Section No. 4 Boring No. 8

Pavement Type

- ☐ Earth
- ☐ Gravel
- ☒ DBST
- ☐ BMP
- ☐ AC

Pavement Existing Condition Rating (Visual)

- ☐ Very Good
- ☐ Good
- ☐ Fair
- ☒ Bad
- ☐ Very Bad

Surface condition has some alligator cracks, potholes and deformation due to structural failure.

Traffic Data and Characteristics

as of November 1989

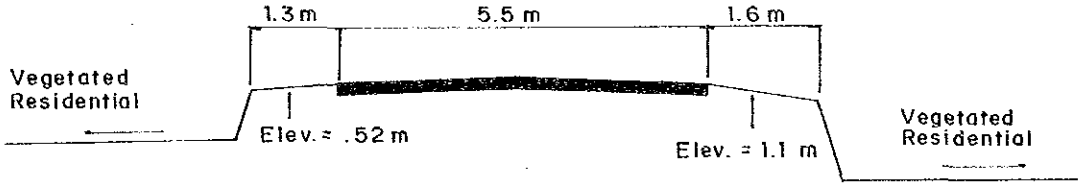
AADT 654

Trucks 37
Buses 2

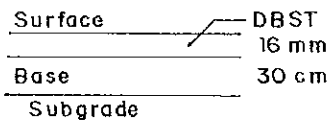
Construction Year

Maintenance History / Operation

Road Cross-Section



Pavement Cross-Section



Environmental Condition

Both side ; Vegetated residential

Drainage Condition

Bad due to grassy side ditch is no longer effective

Subgrade Soil

Soil Classification

W(n)

Max. size	mm	=	37.5
0.075 mm pass	%	=	51
	LL	=	41
	PL	=	26
	PI	=	15
Soaked CBR		=	5

Water Table

Did not noticed

Remarks

Sheet No. 1/4

ROAD CONDITION SURVEY RECORD

Location : TRECE MARTIRES - G.M. ALVARES

Province : Cavite Road Classification : National

Experimental Pavement :

Section No. 5 Boring No. 1

Pavement Type

- ☐ Earth
- ☐ Gravel
- ☐ DBST
- ☐ BMP
- ☒ AC

Pavement Existing Condition Rating (Visual)

- ☐ Very Good
- ☐ Good
- ☒ Fair
- ☒ Bad
- ☐ Very Bad

Surface condition has some aligator cracks due to structural failure ; slightly deformation was observed.

Traffic Data and Characteristics

as of November 1989

AADT 2068

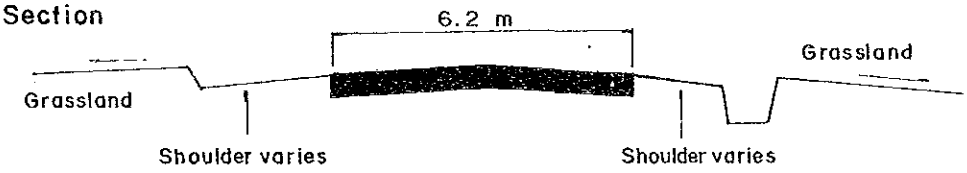
Trucks 220

Buses 114

Construction Year

Maintenance History / Operation

Road Cross-Section



Pavement Cross-Section

Surface — AC — 80 mm

Base — 12 cm

Subgrade

Environmental Condition

Both side is grassy pasture land ; Hilly terrain

Drainage Condition

Good due to underground water level is low

Subgrade Soil

Soil Classification

W(n)

Max. size	mm	= 37.5
0.075 mm pass	%	= 59
	LL	= 54
	PL	= 38
	PI	= 16
Soaked CBR		= 4

Water Table

Did not noticed

Remarks

ROAD CONDITION SURVEY RECORD

Location : TRECE MARTIRES - G.M. ALVARES
Province : Cavite Road Classification : National
Experimental Pavement :
Section No. 5 Boring No. 2

Pavement Type

- ☐ Earth
- ☐ Gravel
- ☐ DBST
- ☐ BMP
- ☒ AC

Pavement Existing Condition Rating (Visual)

- ☐ Very Good
- ☐ Good
- ☐ Fair
- ☒ Bad
- ☐ Very Bad

Surface condition has some aligator cracks , slightly deformation was observed due to structural failure.

Traffic Data and Characteristics

as of November 1989

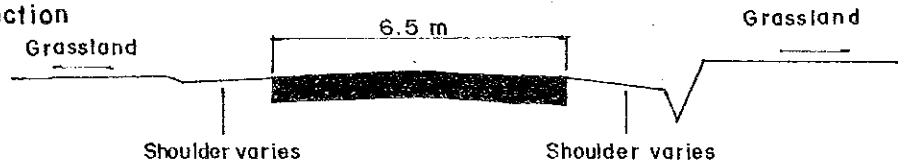
AADT 2068

Trucks 220
Buses 114

Construction Year

Maintenance History / Operation

Road Cross-Section



Pavement Cross-Section

Surface	AC 100 mm
Base	12 cm
Sub-base	15 cm
Subgrade	

Environmental Condition

Both side grassy pasture land ; Hilly terrain

Drainage Condition

Good due to underground water level is low

Subgrade Soil

Soil Classification

W (n)

Max. size	mm	=	37.5
0.075 mm pass	%	=	28
	LL	=	38
	PL	=	25
	PI	=	13
Soaked CBR		=	19

Water Table

Did not noticed

Remarks

ROAD CONDITION SURVEY RECORD

Location : TRECE MARTIRES - G.M. ALVARES

Province : Cavite Road Classification : National

Experimental Pavement :

Section No. 5 Boring No. 3

Pavement Type

- ☐ Earth
- ☐ Gravel
- ☐ DBST
- ☐ BMP
- ☒ AC

Pavement Existing Condition Rating (Visual)

- ☐ Very Good
- ☐ Good
- ☒ Fair
- ☐ Bad
- ☐ Very Bad

Surface condition has some aligator cracks but considered fair

Traffic Data and Characteristics

as of November 1989

AADT 2068

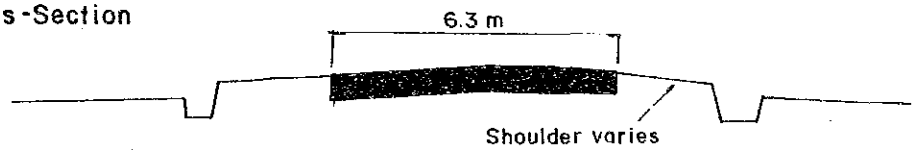
Trucks 220

Buses 114

Construction Year

Maintenance History / Operation

Road Cross-Section



Pavement Cross-Section

Surface	AC / OL 120 mm
Base	10 cm
Sub-base	18 cm
Subgrade	

Environmental Condition

Both side grassy pasture land ; Hilly terrain

Drainage Condition

Good due to underground water level is low

Subgrade Soil

Soil Classification

W(n)

Max. size	mm	= 37.5
0.075 mm pass	%	= 33
	LL	= 29
	PL	= 21
	PI	= 8
Soaked CBR		= 7

Water Table

Did not noticed

Remarks

ROAD CONDITION SURVEY RECORD

Location : TRECE MARTIRES - G.M. ALVARES
Province : Cavite Road Classification : NATIONAL
Experimental Pavement :
Section No. 5 Boring No. 4

Pavement Type

- ☐ Earth
- ☐ Gravel
- ☐ DBST
- ☐ BMP
- ☒ AC

Pavement Existing Condition Rating (Visual)

- ☐ Very Good
- ☐ Good
- ☐ Fair
- ☒ Bad
- ☐ Very Bad

Surface condition has some aligator cracks; patching deformation due to structural failure

Traffic Data and Characteristics

as of November 1989

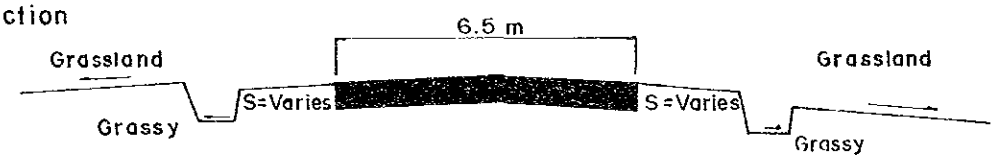
AADT 2068

Trucks 220
Buses 114

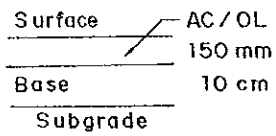
Construction Year

Maintenance History / Operation

Road Cross-Section



Pavement Cross-Section



Environmental Condition

Both side grassy pasture land ; Hilly terrain

Drainage Condition

Good due to underground water level is low

Subgrade Soil

Soil Classification

W (n)

Max. size	mm	=	19
0.075 mm pass	%	=	71
	LL	=	50
	PL	=	33
	PI	=	17
Soaked CBR		=	8

Water Table

Did not noticed

Remarks