

8.3 ECONOMIC FRAMEWORK

8.3.1 Agricultural Sector

The agricultural land expansion was projected in the previous section. Also there are opportunities for improvement in increasing yield and enhancing cropping intensity. To cope with the needs for increasing the agricultural production, efforts should be made;

- agriculture matching to the advantage of the area and the market
- proper and intense cultivation, increase cropping rotation per year
- proper cultivation activities on slope lands such as terracing, hedge row planting, agro-forestry
- proper irrigation maintenance and development
- development of better seeds or species and quality control
- utilization of low cost machinery
- improvement of distribution system and marketing
- market-oriented cropping and commercial crops

The agricultural GVA would be limited by the natural resources much more than the industries and services sectors.

The target crop production GVA was projected by the future agricultural land use, the land productivity by fallow and number of harvested seasons, the target yield by crop, the farmgate price by crop and the average GVA ratio, considering the proportion. The target yield was estimated with the potential yield by crop and the regional attainability. The farmgate price was assumed as constant without inflation factor.

$$CPV_{2016} = \sum_{\substack{\text{crop} \\ \text{province}}} HA_{1995} \times AE \times TY \times FP$$

$$C-GVA_{2016} = APV_{2016} \times R$$

where

CPV ₂₀₁₆	:	Crop Production Value in 2016 (peso)
HA ₁₉₉₅	:	Harvested Area in 1995 by crop by province (ha)
AE	:	Agricultural Land Expansion Rate
TY	:	Target Yield by crop by province (ton/ha)
FP	:	Farmgate Price by crop by province (peso/ton)
C-GVA ₂₀₁₆	:	Crop Production GVA in 2016
R	:	GVA ratio] ≈ 1.0

In this process, 3% growth rate was obtained for the GVA of crop production. Livestock and poultry and the other agricultural activities could expect same or a little more growth from the view point of increase in food consumption and supply of feed. Fishery relies on the limited natural resources and moderate growth was assumed for sustainable development. Forestry was assumed to decrease conserving the environment. Thus, the growth rate of 2.7% was set as an achievable target for the agriculture sector.

TABLE 8.3-1 AGRICULTURAL GVA PROJECTION (1995 constant price : million pesos)

	1995	%	2016	%	1995-2016 Growth rate
Crops	244,164	59.12%	452,900	62.64%	2.99%
Livestock / Poultry	76,606	18.55%	142,500	19.71%	3.00%
Other Activities	19,243	4.66%	37,100	5.13%	3.20%
Fishery	70,206	17.00%	90,200	12.48%	1.20%
Forestry	2,746	0.66%	300	0.04%	-10.00%
Total (million pesos in 1995 constant price)	412,965	100.00%	723,000	100.00%	2.70%

8.3.2 Industry and Service Sector

(1) Methodology

An econometric model suitable for long-term projection was proposed by L.R. Klein and R.F. Kosobud ("Some Econometrics of Growth: Great Ratios of Econometrics," Quarterly Journal of Economics, May, 1961). This model has quite simple structure and because of the simplicity, it is applicable for long-term economic projection. The basic concept of the model is that labor productivity will be determined by the level of capital-equipment ratio (capital accumulation per employee). The model is described as below:

Internal Variables:

Y	:	GDP
S	:	Gross Saving
K	:	Capital Stock
ΔK	:	Increase in Capital
I	:	Gross Investment
N	:	Total Employment
N_h	:	Annual Total Working Hours

External Variables:

P	:	Total Population
W_h	:	Average Daily Working Hours a Day
L_d	:	Annual Average Working Days per Person

Klein-Kosobud Model:

$$(1) \quad \frac{S(t)}{Y(t)} = f \left[\frac{Y(t)}{P(t)} \right]$$

$$(2) \quad \frac{Y(t)}{N_h(t)} = g \left[\frac{K(t-1)}{N(t)} \right]$$

$$(3) \quad \Delta K(t) = f [I(t)]$$

$$(4) \quad K(t) = k(t-1) + \Delta K(t)$$

$$(5) \quad S(t) = I(t)$$

$$(6) \quad N(t) = \alpha(t) \cdot P(t)$$

$$(7) \quad N_h(t) = W_h(t) \cdot L_d(t) \cdot N(t)$$

Formula (1) shows that gross saving ratio is affected by the change of GDP per capita. Formula (2) is the most important one in this model, insisting that labor productivity is determined by capital-equipment ratio. Here, one year is assumed for the gestation period of capital. Formula (3) presents the relation between increment in capital stock and gross investment which includes investment for replacement and rehabilitation. Formulae (4) to (7) are easily deducted by the definition of variables or the definition itself.

Although the model structure is very simple and clear, applicability of the model to the Philippine economy is not apparent. For example, the saving ratio has been fluctuated in spite of almost no change in the level of GDP per capita. Moreover, investment is not fully explained by domestic savings in the Philippines, because a fairly large portion of investment comes from abroad in the forms of direct investment and loan.

Therefore, some modifications and further simplification would be needed when applying the model to the Philippine economy. Some intrepid assumptions would be also needed. However, the basic concept of the model represented by the formula (2) could be pursued to project the future economic growth of the Philippines.

(2) Input Data

Table 8.3-2 shows actual data of the main variables in the model since 1970. All the monetary data are expressed in million pesos at 1985 prices. Data sources are the Statistical Yearbook, 1985 and 1996.

Aside from the data in the Table, capital accumulation in 1969 was assumed to be 300,000 million pesos at 1985 prices. This amount is almost equivalent to the sum of gross capital formation during a decade of 1960s and if taking account of consumed capital by being worn out or becoming out of date, the said amount would correspond the total capital formation since the end of World War II.

As for the annual working days and daily working hours, no change was assumed since 1970 until today and also in the future, as no reliable data was available.

TABLE 8.3-2 INPUT DATA FOR THE KLEIN-KOSOBUD MODEL

(1000 persons)

Year	(1000 persons)							
	Population (1000)	Labor Force			Employment			Total
		Participation Rate(%)	Unemployment Rate (%)	Employment	Primary	Secondary	Tertiary	
1970	36,684	49.6	7.7	12,300	6,100	1,876	3,198	11,174
1971	37,703	50.2	5.3	13,241	6,321	1,967	4,228	12,516
1972	38,751	48.4	5.4	13,249	6,863	1,835	3,879	12,577
1973	39,827	50.4	4.8	14,559	7,766	1,834	4,235	13,835
1974	40,934	49.7	3.2	14,283	7,684	1,909	4,205	13,798
1975	42,071	51.0	4.2	15,161	7,768	2,207	4,504	14,479
1976	43,213	60.5	5.2	15,017	7,659	2,159	4,418	14,236
1977	44,385	58.2	4.5	15,002	7,474	2,093	4,672	14,239
1978	45,590	62.5	4.1	16,792	8,403	2,370	5,297	16,070
1979	46,827	61.4	4.0	16,945	8,428	2,460	5,359	16,247
1980	48,098	59.8	5.0	17,308	8,453	2,554	5,421	16,428
1981	49,231	61.7	5.3	18,423	8,928	2,545	5,974	17,447
1982	50,390	60.1	9.4	18,467	8,919	2,473	5,979	17,371
1983	51,577	63.6	7.9	20,130	9,880	2,764	6,568	19,212
1984	52,791	63.5	10.6	20,756	9,733	2,899	7,041	19,673
1985	54,034	63.3	11.1	20,811	9,757	3,001	7,318	20,076
1986	55,307	63.8	11.1	21,573	9,780	3,107	7,605	20,493
1987	56,609	65.7	9.1	22,880	9,804	3,216	7,904	20,925
1988	57,942	65.4	8.3	23,451	9,828	3,330	8,215	21,373
1989	59,306	64.6	8.4	23,858	9,852	3,447	8,538	21,837
1990	60,703	64.5	8.1	24,525	10,185	3,387	8,946	22,518
1991	62,209	64.5	9.0	25,246	10,402	3,686	8,881	22,969
1992	63,752	65.0	8.6	26,180	10,870	3,816	9,210	23,896
1993	65,333	64.7	8.9	26,822	11,194	3,793	9,443	24,430
1994	66,953	64.4	8.4	27,483	11,249	3,971	9,938	25,158
1995	68,614	65.6	8.4	28,040	11,324	4,007	10,345	25,676

(million pesos at 1985 constant price)

Year	(million pesos at 1985 constant price)									
	GDP				Consumption			Capital Formation		
	Primary	Secondary	Tertiary	Total	Personal	Government	Total	Fixed Capital	Changes in Stock	
1970	86,766	112,698	135,773	335,237	246,343	24,193	270,536	59,371	24,343	
1971	90,516	121,314	140,036	351,866	255,582	26,984	282,566	62,704	23,606	
1972	94,184	130,251	144,060	368,495	265,167	30,098	295,265	66,225	22,891	
1973	98,136	141,996	153,520	393,651	278,315	33,155	311,470	79,081	25,846	
1974	102,221	154,752	163,551	420,524	292,115	36,522	328,638	94,434	29,183	
1975	106,445	168,603	174,184	449,232	306,600	40,232	346,832	112,766	32,951	
1976	114,797	184,834	179,837	479,467	317,945	43,316	361,261	122,312	32,683	
1977	120,190	203,998	188,321	512,509	341,511	42,663	384,175	128,297	31,055	
1978	125,739	218,920	199,438	544,098	359,325	44,563	403,889	143,520	32,984	
1979	131,170	238,788	210,605	580,563	375,645	45,713	421,358	165,831	35,255	
1980	137,888	247,325	224,001	609,214	393,678	47,298	440,977	170,510	32,324	
1981	142,919	258,245	231,056	632,221	409,267	49,198	458,465	176,547	30,705	
1982	149,641	264,957	238,889	653,467	422,007	52,328	474,335	177,635	1,942	
1983	144,586	268,987	252,144	665,717	424,634	49,854	474,488	192,637	-1,567	
1984	143,247	238,038	235,677	616,962	425,767	43,971	469,738	137,461	-17,063	
1985	140,554	200,548	230,781	571,883	420,832	43,520	464,352	94,168	-12,121	
1986	145,725	205,184	240,534	591,423	434,815	43,669	478,484	95,083	-4,782	
1987	150,414	213,389	253,120	616,923	452,386	45,792	498,178	101,627	6,458	
1988	155,292	232,052	271,237	658,581	480,562	49,943	530,505	118,252	5,708	
1989	159,964	249,175	290,309	699,448	504,619	53,434	558,053	143,804	5,506	
1990	160,734	255,548	304,408	720,690	531,772	57,042	588,814	165,364	7,587	
1991	162,937	248,718	304,867	716,522	543,788	55,826	599,614	141,903	1,144	
1992	163,571	247,384	307,986	718,941	561,509	55,337	616,846	150,974	3,278	
1993	167,053	251,459	315,644	734,156	578,589	58,746	637,335	164,125	2,272	
1994	171,472	265,972	329,006	766,450	600,106	62,343	662,449	176,388	4,409	
1995	172,999	285,219	345,232	803,450	622,985	64,579	687,564	187,211	1,484	

(3) Estimate of Parameters

1) Labor Productivity and Capital Equipment Ratio

Capital Accumulation in year t is expressed as the sum of the capital accumulation in the previous year ($t-1$), capital formation and changes in stock in year t minus capital depreciation (loss in capital). Here, a capital carry over rate which is 1.0 minus depreciation rate is multiplied to the capital accumulation in the previous year, instead of deducting depreciation. The depreciation rate was assumed at 10 to 20% per annum.

The capital accumulation divided by employment is called capital equipment ratio. If taking employment only in the secondary sector, this ratio was about 200,000 pesos in early 1970s and rose gradually with the peak of 350,000 pesos in 1983 and then fell down to the level of 200,000 pesos in 1995. The ratio of the tertiary sector also shows the same trend pattern as of the secondary sector.

Between the labor productivity and the capital equipment ratio, a positive correlation is clearly observed (Figure 8.3-1). It is reasonable that the gradient of the linear correlation in the secondary sector is much more steep than in the tertiary sector, because the former sector depends on capital more than in the latter. Linear regression analysis resulted in the two equations with high regression coefficient as shown below:

Secondary sector

$$Y/Nh = 0.25157 (K_t/N) + 19.0406 \quad (R = 0.975)$$

Tertiary Sector

$$Y/Nh = 0.10564 (K_t/N) + 25.3815 \quad (R = 0.942)$$

Secondary Industry

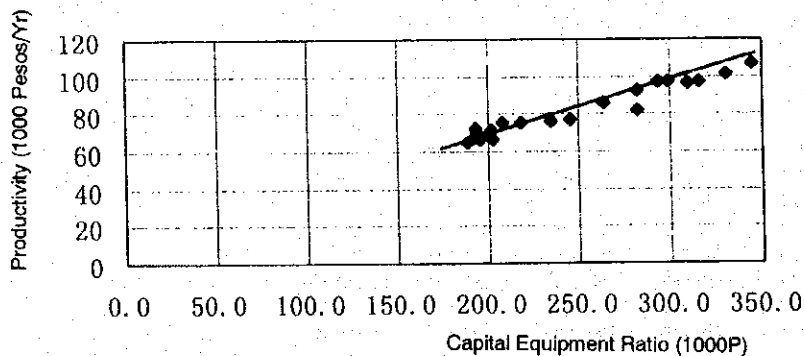


FIGURE 8.3-1A CORRELATION OF LABOR PRODUCTIVITY AND ACCUMULATED CAPITAL STOCK

Tertiary Industry

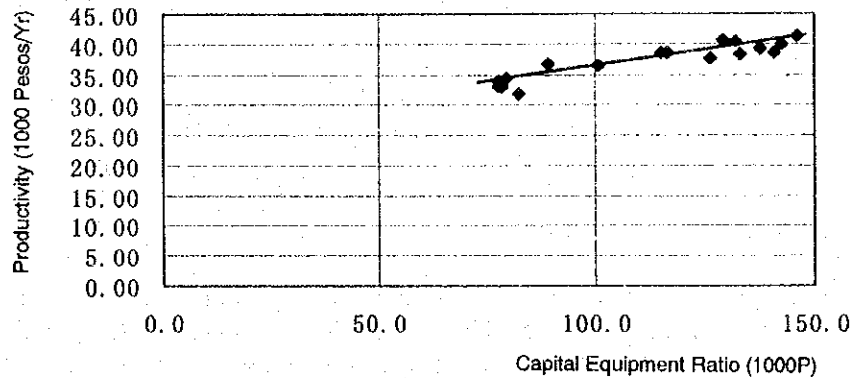


FIGURE 8.3-1B CORRELATION OF LABOR PRODUCTIVITY AND ACCUMULATED CAPITAL STOCK

2) Capital Formation Ratio to Gross Domestic Product

In the original Klein – Kosobud model, capital formation is a part of gross investment which is equal to gross saving. And gross saving is explained by the level of per capita GDP. In the Philippines, however, the propensity to save is low and not stable. Change in the propensity can not always be explained by per capita GDP. In addition, capital inflow from abroad is significant and then gross investment is larger than gross saving. Thus, the formula (1), (3) and (5) in the original model have to be abandoned.

Instead of these equations, the direct relationship between capital formation and GDP was studied and the rates of the former to the latter are illustrated in Figure 8.3-2. The average rate in the past 25 years is 24.8%. As the annual change of the rates is hardly explained by other economic indicators, this rate should be treated as a policy variable to be defined externally.

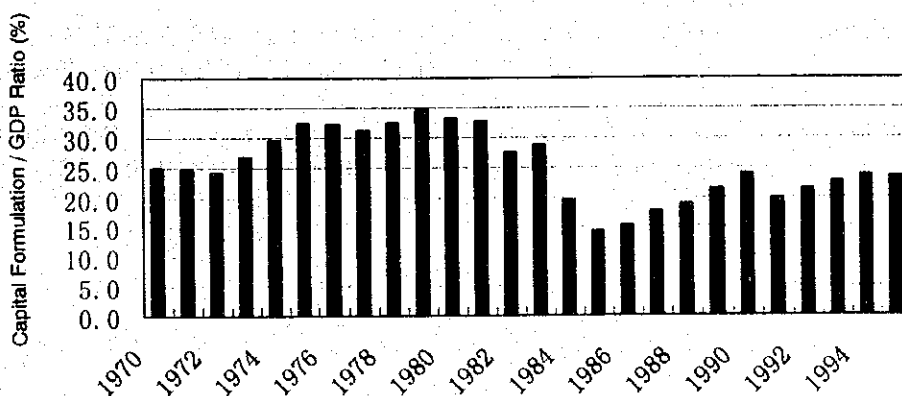


FIGURE 8.3-2 TREND OF CAPITAL FORMATION/GDP RATIO

(4) Forecast Results

By simplifying the model as described above, future DGP in the secondary and tertiary sector was forecast taking the following steps. (Future employment is an external variable, given from the results of section 1 of this chapter.)

- Step 1: To set up the capital formation / GDP rate in year t
- Step 2: To calculate capital accumulation in year t
- Step 3: To calculate labor productivity in year (t+1)
- Step 4: To estimate GDP in year (t+1), using labor productivity and employment
- Step 5: Go back to Step 1.

Table 8.3-3 shows estimated growth rate of labor productivity of the secondary and tertiary sector under different capital formation / GDP rates. Because of adopting linear equations for the relationship between labor productivity and capital equipment ratio, future productivity growth rates has a declining tendency even under a constant rate of capital formation / GDP rate.

TABLE 8.3-3 GROWTH RATE OF LABOR PRODUCTIVITY BY CAPITAL FORMATION / GDP RATE

	(% p.a.)			
dK/Y rate	1998-2004	2005-2010	2011-2016	1998-2016
Secondary Sector				
20.0	1.19	1.07	0.89	1.06
22.0	1.95	1.58	1.25	1.61
24.0	2.71	2.08	1.63	2.17
26.0	3.46	2.58	2.01	2.72
28.0	4.20	3.08	2.42	3.28
30.0	4.93	3.59	2.83	3.84
Tertiary Sector				
20.0	0.35	0.27	0.32	0.31
22.0	0.63	0.48	0.48	0.54
24.0	0.93	0.70	0.68	0.78
26.0	1.24	0.95	0.89	1.04
28.0	1.56	1.21	1.14	1.32
30.0	1.90	1.50	1.42	1.62

To forecast future GDP, three scenarios were set up concerning the capital formation / GDP rate in the future:

- Scenario 1 High Growth Case: 30% of capital formation/GDP rate for entire period of 1997 to 2016.
- Scenario 2 Medium Growth Case: 30% of capital formation/GDP rate for the period of 1997 to 2004, 27.5% for 2005 to 2010 and 25% for 2011 to 2016.
- Scenario 3 Low Growth Case: 27% of capital formation/GDP rate for the period of 1997 to 2004, 25% for 2005 to 2010 and 23% for 2011 to 2016.

The results are shown in Table 8.3-4 and Figure 8.3-3. Under the high growth case, 5.54% of average annual growth rate is expected for the whole planning period, 5.06% under the medium growth case and 4.58% under low growth case, respectively. Among the three, the medium growth case was selected as the basis of this study, because of its most plausibility. It may be difficult to expect that such a high capital formation/GDP rate as 30% will last continuously for 20 years. On the contrary, the low growth scenario does not reflect properly rapid economic growth at present and expected in the near future.

8.3.3 Economic Framework up to 2016

Based on the medium growth case stated in the previous section, future economic framework was established, major results of which are shown in Figure 8.3-3.4 & 5 and Table 8.3-5.

(1) National Economic Framework

Future agricultural production stated in 8.3.1 and production in the secondary and tertiary sectors under the medium growth case stated in 8.3.2 were synthesized into a national economic framework. Figure 8.3-4 presents the national economic growth by sector. Economic growth in the near future up to 2004 was estimated as high as 6.2% and would gradually slow down to 4.8% in 2004 to 2010 and 3.6% in 2010 to 2016. The secondary sector would be the leading sector throughout the projection period.

Sectoral share of GDP was 21.7 : 32.1 : 46.2 [primary (agriculture) : secondary (industries) : tertiary sector (services)] in 1995 and these shares would change to 13.4 : 42.8 : 43.8 in 2016 (Figure 8.3-5). The share of the primary sector would decrease drastically and replaced by the secondary sector. The tertiary sector would slightly increase its share and as the result, the secondary and the tertiary sectors would have almost the same share in GDP.

(2) Regional Economic Framework

GDP was distributed into regions by using several assumptions: In the primary sector, regional disparities in labor productivity would be improved decreasing the current gap by a half in percentage by 2016. In the secondary sector, labor productivity was extrapolated with the same rate as national average and then adjusted with the weights shown in Table 8.3-5 which were determined considering the disparities and development plans for economic growth centers. In the tertiary sector, national average growth rate in productivity was applied uniformly to all the regions. The result is shown in Table 8.3-5.

TABLE 8.3-4 ECONOMIC GROWTH PROJECTIONS FOR ALTERNATIVE SCENARIOS

	1995	1997	2000	2004	2005	2010	2015	2016				
High Case									Growth			
Productivity	(pesos per employment)								1995-2004	2004-2010	2010-2016	1995-2016
Agriculture	36,627	37,474	38,782	40,597	41,064	43,480	46,048	46,577	1.15%	1.15%	1.15%	1.15%
Industries	151,995	167,351	193,343	234,383	242,797	289,623	333,001	342,414	4.93%	3.59%	2.83%	3.94%
Services	84,761	88,013	93,126	100,407	101,913	109,789	117,819	119,481	1.90%	1.50%	1.42%	1.65%
GVA (million pesos)	1,906,430	2,144,525	2,573,964	3,279,774	3,459,707	4,494,017	5,659,328	5,910,291	6.21%	5.39%	4.67%	5.54%
Agriculture	412,965	437,760	478,621	536,730	551,720	629,900	708,178	723,015	2.96%	2.70%	2.32%	2.70%
Industries	612,540	716,969	922,927	1,282,296	1,373,354	1,909,035	2,517,768	2,652,612	8.56%	6.86%	5.64%	7.23%
Services	880,925	989,798	1,172,417	1,460,749	1,534,633	1,955,082	2,433,382	2,534,664	5.78%	4.98%	4.42%	5.16%
Per capita GDP	27,784	29,977	33,726	39,689	41,082	48,927	57,161	58,944	4.04%	3.55%	3.15%	3.65%
GVA Sector Share												
Agriculture	21.66%	20.41%	18.59%	16.36%	15.95%	14.02%	12.51%	12.23%				
Industries	32.13%	33.43%	35.86%	39.10%	39.70%	42.48%	44.49%	44.88%				
Services	46.21%	46.15%	45.55%	44.54%	44.36%	43.50%	43.00%	42.89%				
Medium Case									Growth			
Productivity									1995-2004	2004-2010	2010-2016	1995-2016
Agriculture	36,627	37,474	38,782	40,597	41,064	43,480	46,048	46,577	1.15%	1.15%	1.15%	1.15%
Industries	151,995	167,351	193,343	234,383	240,664	274,689	292,879	296,648	4.93%	2.68%	1.29%	3.24%
Services	84,761	88,013	93,126	100,407	101,481	107,028	110,288	110,939	1.90%	1.07%	0.80%	1.29%
GVA (million pesos)	1,906,430	2,144,525	2,573,964	3,279,774	3,441,136	4,346,413	5,200,430	5,374,541	6.21%	4.80%	3.60%	5.08%
Agriculture	412,965	437,760	478,621	536,730	551,720	629,900	708,178	723,015	2.96%	2.70%	2.32%	2.70%
Industries	612,540	716,969	922,927	1,282,296	1,361,289	1,810,598	2,214,412	2,298,072	8.56%	5.92%	4.05%	6.50%
Services	880,925	989,798	1,172,417	1,460,749	1,528,127	1,905,915	2,277,840	2,353,454	5.78%	4.53%	3.58%	4.79%
Per capita GDP	27,784	29,977	33,726	39,689	40,861	47,320	52,526	53,601	4.04%	2.97%	2.10%	3.18%
GVA Sector Share												
Agriculture	21.66%	20.41%	18.59%	16.36%	16.03%	14.49%	13.62%	13.45%				
Industries	32.13%	33.43%	35.86%	39.10%	39.56%	41.66%	42.58%	42.78%				
Services	46.21%	46.15%	45.55%	44.54%	44.41%	43.85%	43.80%	43.79%				
Low Case									Growth			
Productivity									1995-2004	2004-2010	2010-2016	1995-2016
Agriculture	36,627	37,474	38,782	40,597	41,064	43,480	46,048	46,577	1.15%	1.15%	1.15%	1.15%
Industries	151,995	163,861	183,419	213,174	217,629	241,342	253,161	255,581	3.83%	2.09%	0.96%	2.51%
Services	84,761	87,151	90,863	96,059	96,779	100,464	102,550	102,961	1.40%	0.75%	0.41%	0.93%
GVA (million pesos)	1,906,430	2,119,879	2,498,102	3,100,485	3,240,037	4,009,719	4,740,311	4,887,159	5.55%	4.38%	3.35%	4.58%
Agriculture	412,965	437,760	478,621	536,730	551,720	629,900	708,178	723,015	2.96%	2.70%	2.32%	2.70%
Industries	612,540	702,017	875,555	1,166,263	1,230,994	1,590,793	1,914,110	1,979,934	7.42%	5.31%	3.71%	5.75%
Services	880,925	980,102	1,143,926	1,397,493	1,457,323	1,789,026	2,118,023	2,184,210	5.26%	4.20%	3.38%	4.42%
Per capita GDP	27,784	29,633	32,732	37,519	38,474	43,654	47,878	48,740	3.39%	2.56%	1.85%	2.71%
GVA Sector Share												
Agriculture	21.66%	20.65%	19.16%	17.31%	17.03%	15.71%	14.94%	14.79%				
Industries	32.13%	33.12%	35.05%	37.62%	37.99%	39.67%	40.36%	40.51%				
Services	46.21%	46.23%	45.79%	45.07%	44.98%	44.62%	44.68%	44.69%				

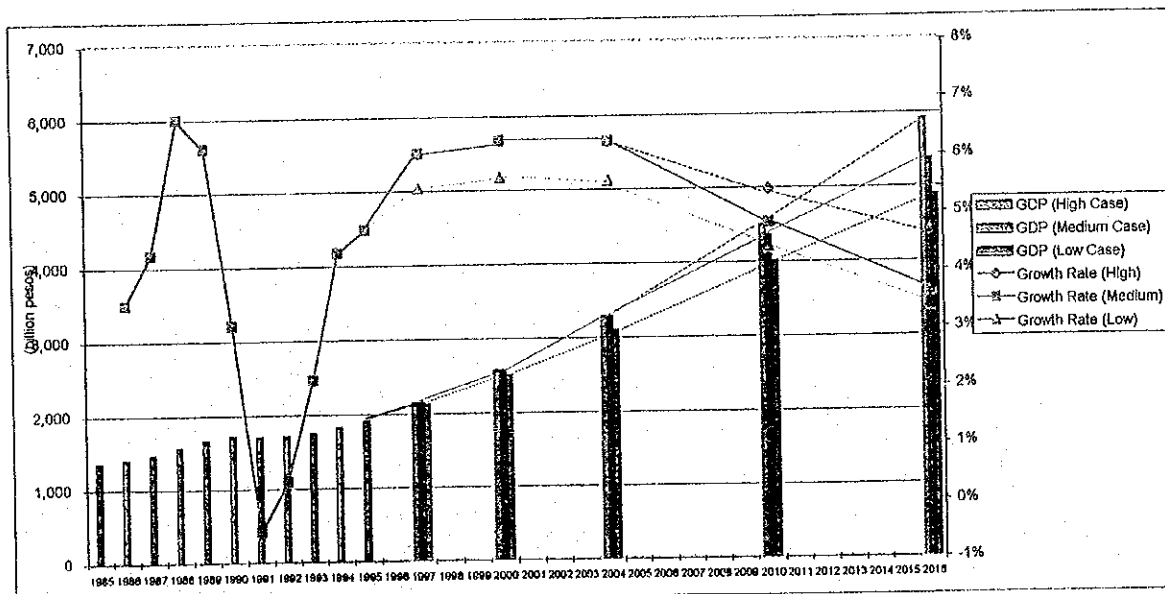


FIGURE 8.3-3 ECONOMIC GROWTH PROJECTIONS FOR ALTERNATIVE SCENARIOS

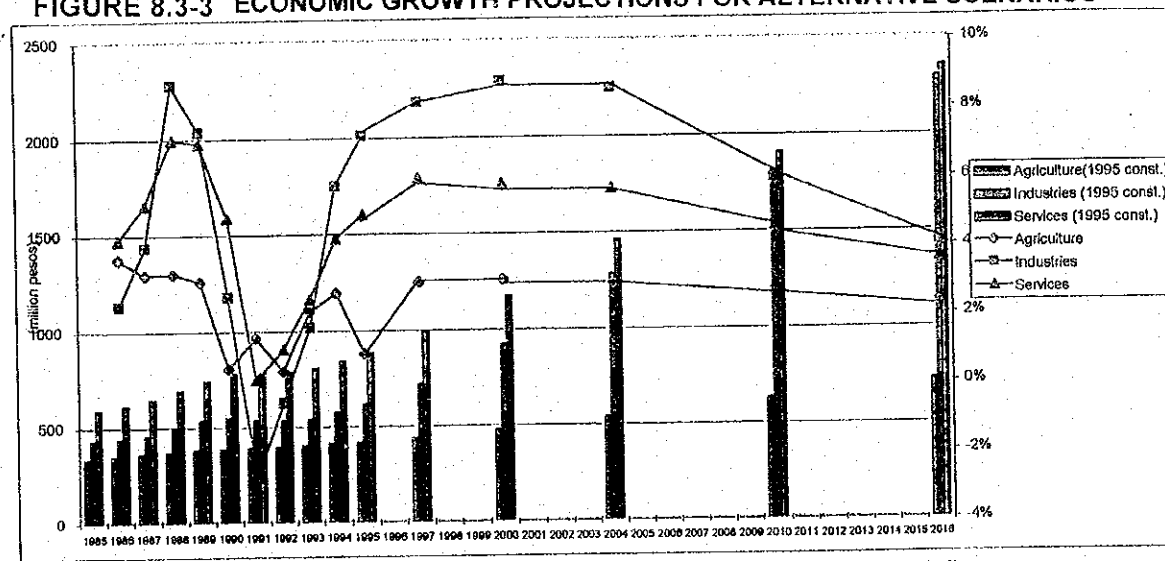


FIGURE 8.3-4 PROJECTION OF GDP BY SECTOR (MEDIUM CASE)

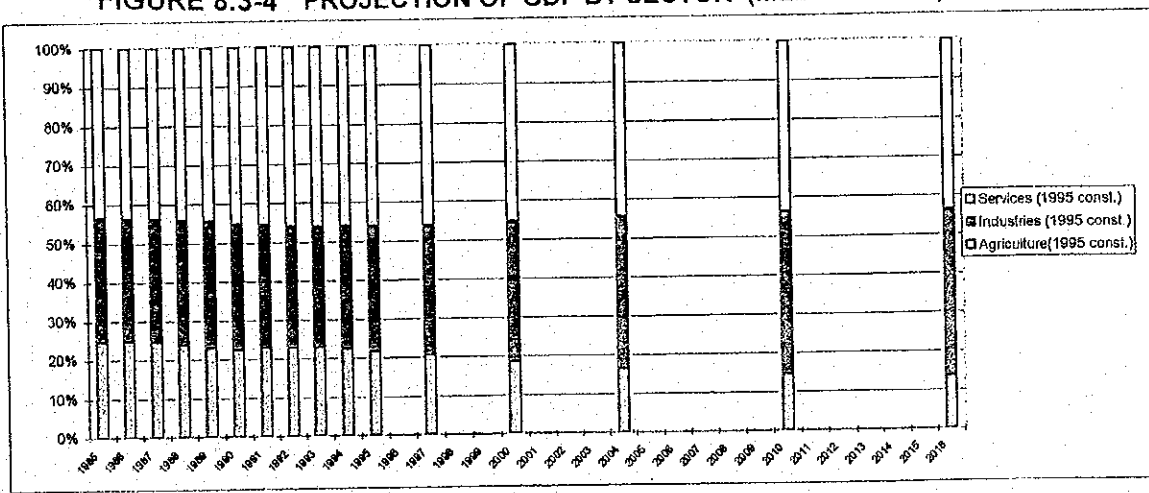


FIGURE 8.3-5 PROJECTION OF GDP SHARE BY SECTOR (MEDIUM CASE)

TABLE 8.3-5 PROJECTION OF GRDP

Employment in 1995 (in thousands)					Productivity 1995 (1000 pesos per employment)					GVA by Sector (1995 current price) (million pesos)				
REGION	Agriculture	Industry	Service	Total	REGION	Agriculture	Industry	Service	Total	REGION	Agriculture	Industry	Service	Total
NCR*	1,223	836	2,283	3,119	NCR	-	277	170	196	NCR	0	231,771	387,290	619,061
CAR	348	55	140	543	CAR	22	359	80	71	CAR	7,793	19,760	11,237	38,790
Region 1	759	204	510	1,473	Region 1	32	45	49	40	Region 1	24,865	9,139	24,865	55,252
Region 2	801	79	331	1,211	Region 2	27	64	44	34	Region 2	21,657	5,058	14,442	41,157
Region 3	702	402	810	1,914	Region 3	53	147	77	83	Region 3	37,141	58,979	62,150	158,270
Region 4	1,223	823	1,472	3,518	Region 4	62	126	65	78	Region 4	75,413	103,629	95,437	274,479
Region 5	985	251	868	1,904	Region 5	21	41	37	29	Region 5	21,034	10,259	24,529	55,822
Region 6	1,223	251	850	2,324	Region 6	37	122	69	58	Region 6	45,419	30,627	58,787	134,833
Region 7	832	386	730	1,948	Region 7	24	98	91	64	Region 7	20,277	37,675	66,383	124,395
Region 8	883	108	479	1,450	Region 8	18	152	36	35	Region 8	16,269	16,382	17,455	50,106
Region 9	563	87	383	1,033	Region 9	44	99	45	50	Region 9	26,424	8,649	17,082	52,155
Region 10	893	213	582	1,688	Region 10	44	127	60	60	Region 10	36,928	27,145	35,079	101,152
Region 11	1,008	241	747	1,996	Region 11	50	124	62	64	Region 11	50,900	29,955	46,540	127,395
Region 12	564	59	225	848	Region 12	31	351	65	62	Region 12	17,245	20,690	14,575	52,510
ARMM	511	35	183	729	ARMM	20	81	28	25	ARMM	10,216	2,822	5,076	18,114
Philippines	11,275	4,030	10,383	25,688	Philippines	37	152	85	74	Philippines	412,965	612,540	880,928	1,906,431

(Source : National Statistics Office)
* Agricultural employment of 48 thousand was shifted to the services sector.

Employment in 2016 (in thousands)					Productivity 2016 (1000 pesos per employment)					GVA in 2016 (million pesos 1995 price) (adjusted)				
REGION	Agriculture	Industry	Service	Total	REGION	Agriculture	Industry	Service	Total	REGION *	Agriculture	Industry	Service	Total
NCR*	0	1,607	4,660	6,267	NCR	0	487	222	293	NCR	0	301,301	1,034,670	1,835,972
CAR	479	106	286	871	CAR	32	631	105	131	CAR	15,378	68,316	30,020	113,715
Region 1	1,045	392	1,041	2,478	Region 1	42	87	84	59	Region 1	43,697	35,107	66,428	145,232
Region 2	1,103	152	676	1,930	Region 2	37	125	57	51	Region 2	40,607	19,430	38,563	98,620
Region 3	966	773	1,653	3,392	Region 3	63	286	100	134	Region 3	61,025	226,564	166,038	453,627
Region 4	1,684	1,582	3,004	6,270	Region 4	72	246	85	124	Region 4	121,311	393,085	254,966	774,362
Region 5	1,356	482	1,363	3,202	Region 5	31	88	48	47	Region 5	42,094	43,350	65,531	150,975
Region 6	1,684	482	1,735	3,901	Region 6	47	238	91	91	Region 6	79,300	117,652	157,053	354,006
Region 7	1,145	742	1,490	3,377	Region 7	34	228	119	116	Region 7	39,071	173,672	177,347	390,089
Region 8	1,188	208	978	2,373	Region 8	28	266	48	58	Region 8	33,855	56,637	46,632	137,125
Region 9	775	167	782	1,724	Region 9	57	194	58	71	Region 9	44,231	33,225	45,636	123,091
Region 10	1,229	409	1,188	2,827	Region 10	54	249	79	93	Region 10	65,377	104,276	93,716	263,968
Region 11	1,388	463	1,525	3,376	Region 11	61	291	82	103	Region 11	84,320	138,084	124,335	346,639
Region 12	776	113	459	1,349	Region 12	40	616	85	106	Region 12	31,387	71,531	38,938	141,857
ARMM	704	67	373	1,144	ARMM	30	157	36	40	ARMM	20,862	10,841	13,561	45,254
Philippines	15,523	7,747	21,212	44,482	Philippines	47	287	111	121	Philippines	723,015	2,293,072	2,353,454	5,374,541

CHAPTER 9

FUTURE TRAFFIC DEMAND

9.1 METHODOLOGY

9.1.1 General

The procedure for traffic demand forecast is shown in Figure 9.1-1. The procedure is divided into following five steps:

Step - 1: Development of Prediction Models

Various models are developed based on present condition, including:

- Trip Generation/Attraction Model to predict the generation and attraction volume of passenger/commodity based on socio-economic indicators of the zone,
- Trip Distribution Model to estimate the distribution of the generation/attraction volume into OD volume,
- Vehicle Type Distribution Model to estimate the distribution of the OD volume by type of vehicle, and
- Average Occupancy/Average Load.

Step - 2: Forecast of Passenger and Commodity Trip Generation/Attraction Volume by Zone

Trip generation/attraction of each zone in terms of number of passengers and commodity tonnage is estimated based on the future socio-economic indicators of the zone applying the Trip Generation/Attraction Model.

Step - 3: Preparation of Passenger/Commodity OD Matrix

Passenger/commodity OD matrix is prepared by distributing the generation/attraction volume to each origin/destination applying the Trip Distribution Model.

Step - 4: Preparation of Vehicle OD Matrix

Passenger/commodity OD volume is divided by type of vehicle applying the Vehicle Type Distribution Model, then number of vehicles by type is estimated assuming the Average Occupancy/Load. Thus, the passenger/commodity OD matrix is converted into vehicle OD matrix.

Step - 5: Estimation of Traffic Volume on Each Link

The OD traffic is assigned to the road network and traffic volume on each link is obtained,

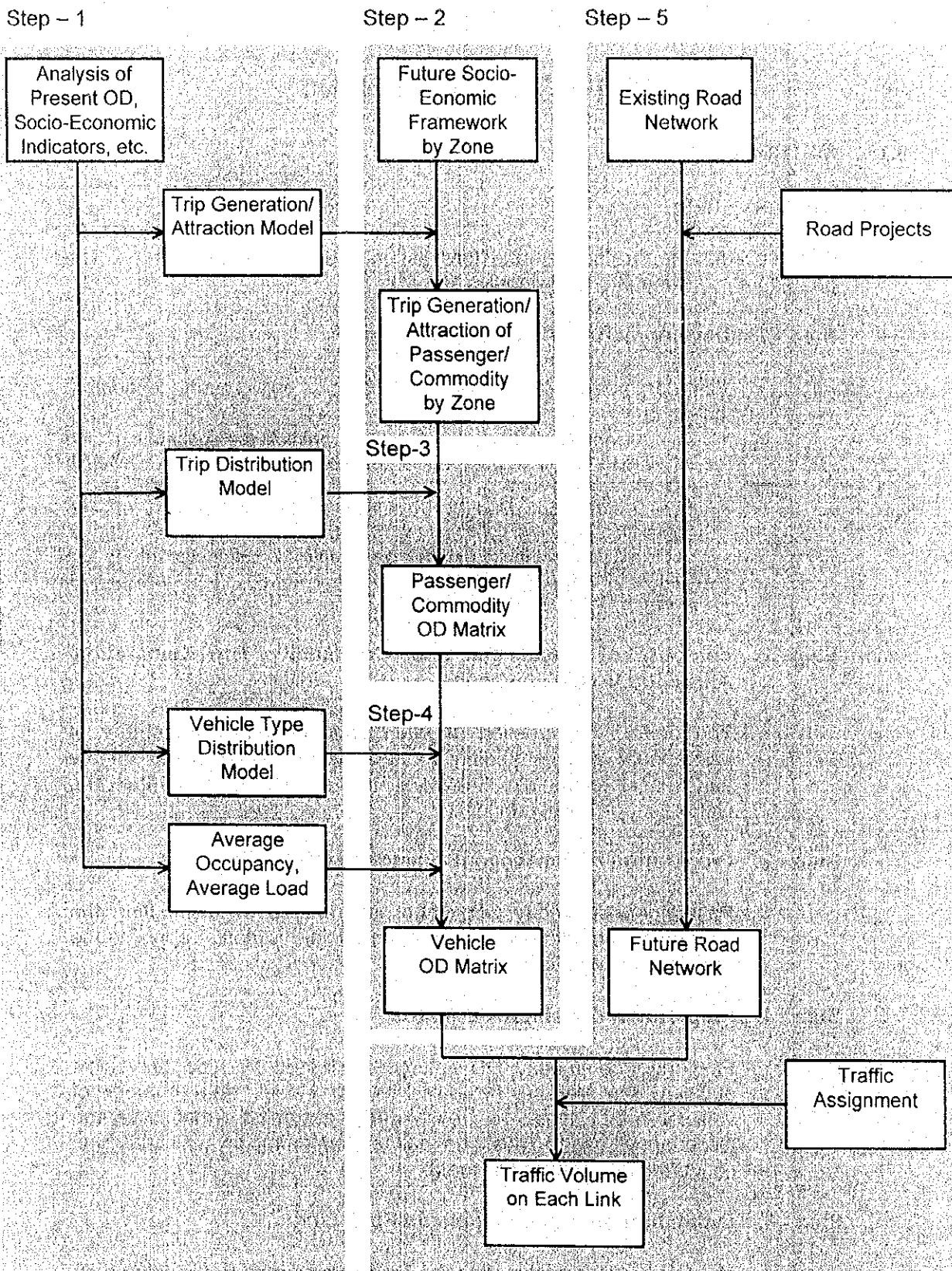


FIGURE 9.1-1 PROCEDURE FOR TRAFFIC DEMAND FORECAST

9.1.2 Trip Generation / Attraction Model

(1) Kind of Model

Road transport is composed of passenger and commodity trips, and the latter is divided into four types: agricultural products, manufactured products, mineral products and construction materials. Each of the above five types has generation and attraction, total number of categorized generation/attraction being 10.

However, generation and attraction of passenger trips in each zone are the same. As for mineral products and construction materials, the distribution of their generation zones do not change so much and their generation volumes can be reasonably assumed to increase according to the demand in the attraction zones. Therefore, generation models of mineral products and construction materials are not developed.

Consequently, the following seven models were developed:

1. Generation/attraction model for passenger
2. Generation model for agricultural products
3. Attraction model for agricultural products
4. Generation model for manufactured products
5. Attraction model for manufactured products
6. Attraction model for mineral products
7. Attraction model for construction materials

(2) Explanatory Variables

The following socio-economic indicators were used as explanatory variables:

- Urban population
- Rural population
- GRDP in the primary sector
- GRDP in the secondary sector
- GRDP in the tertiary sector
- Per capita GRDP

In addition to the above indicators, the factor related to the road condition was included in the analysis since there was potential demands not being fully realized due to unsatisfactory road conditions. In such consideration, the factor defined as follows was used as a parameter representing the road condition:

$$S_i = \frac{\sum_j V_{ij} \cdot P_j \cdot L_{ij}^\gamma}{\sum_j P_j \cdot L_{ij}^\gamma}$$

where, S_i = road condition factor of zone i (km/hr)
 V_{ij} = travel speed of the route from zone i to j (km/hr)
 L_{ij} = length of the route from zone i to j (km)
 P_j = population of zone j
 $\gamma = -1.5$ ¹⁾

S_i is considered as an average travel speed from zone i to all other zones, weighted by the demand to respective zones.

¹⁾ γ - value is derived from multiple regression analysis in the form:

$$PT_{ij} = \alpha \cdot P_i \cdot P_j \cdot L_{ij}^\gamma$$

where, PT_{ij} = Number of passengers from zone i to j
 P_i, P_j = Population of zone i and j , respectively
 L_{ij} = length of the route from zone i to j

(3) Model Structures

The general form of the model is as follows:

$$Y = S^{\gamma} [(\alpha_1 I^{\beta} + \alpha_2) Pu + (\alpha_3 I^{\beta} + \alpha_4) Pr + \alpha_5 Gp + \alpha_6 Gs + \alpha_7 Gt]$$

where,

Y = Generation/attraction (number of passengers or commodity tonnage)

S = Road condition factor (km/hr)

I = Per capita GRDP (1,000 peso)

Pu = Urban population

Pr = Rural population

Gp = GRDP in the primary sector (million peso)

Gs = GRDP in the secondary sector (million peso)

Gt = GRDP in the tertiary sector (million peso)

$\gamma, \beta, \alpha_1, \alpha_2, \alpha_3, \alpha_4, \alpha_5, \alpha_6, \alpha_7$ = parameters obtained by the multiple regression analysis based on the present values.

As a result of the non-linear multiple regression analysis, the parameters and correlation coefficient were obtained as follows:

	Passenger	Agricultural Production		Manufactured Products		Mineral	Const'n
	Generation / Attraction	Generation	Attraction	Generation	Attraction	Attraction	Attraction
γ	1.779	0.995	0.734	0.970	0.743	0.829	0.624
β	0.223	-	-1.566	-	2.014	0.860	-
α_1	0.0000976	-	-0.00468	-	0.000000441	0.000000139	-
α_2	-0.000124	-	0.000294	-	0.0000654	0.0000166	0.0000199
α_3	0.0000633	-	-0.00653	-	0.0000000218	0.000000708	-
α_4	-0.000105	-	0.0000641	-	0.00000579	-0.00000888	0.00000697
α_5	-	0.00380	-	-	-	-	-
α_6	-	-	-	0.00457	-	0.000210	0.00535
α_7	-	-	-	-	-	-	0.000818
r	0.856	0.592	0.648	0.753	0.705	0.696	0.811
(correlation coefficient)							

9.1.3 Trip Distribution Model

Trip distribution is the process of estimating the distribution of the given generated/attracted trips in each zone into individual trips between each OD pair, and providing a full matrix of trips between all zones.

A Trip Distribution Model was developed by the analysis of present trip distribution pattern. The model is expressed by the following equation:

$$X_{ij} = G_i A_j T_{ij}^{\gamma} K_{ij} \left(\frac{1}{\sum_i G_i T_{ij}^{\gamma} K_{ij}} + \frac{1}{\sum_j A_j T_{ij}^{\gamma} K_{ij}} \right) / 2$$

where,

X_{ij} = OD volume from zone i to j

G_i = Generation volume in zone i

A_j = Attraction volume in zone j

T_{ij} = Travel time from zone i to j

γ = Parameter obtained by the regression analysis based on the present OD

K_{ij} = Adjustment factor to correct the difference between calculated value and actual value at the base year

γ was calculated individually by island and by kind of OD, as shown below:

	Panay	Negros	Cebu	Samar/ Leyte	Mindanao
Passenger	-1.445	-2.000	-1.460	-1.368	-1.348
Agricultural products	-0.756	-1.316	-0.624	-0.711	-0.729
Manufactured products	-0.502	-1.184	-0.612	-0.735	-0.733
Mineral products	-0.362	-0.852	-0.200	-0.667	-0.429
Construction materials	-0.597	-1.153	-0.200	-0.418	-0.528

K_{ij} is calculated as follows:

$$K_{ij} = X_{ij} / X_{ij}^1$$

where, X_{ij} = Present OD volume from zone i to j (actual value)

X_{ij}^1 = Calculated value of present OD applying the above Trip Distribution Model assuming all $K_{ij} = 1$.

X_{ij} values are corrected by Frator Method in order to satisfy the following relations:

$$\sum_j X_{ij} = G_i$$

$$\sum_i X_{ij} = A_j$$

9.1.4 Vehicle Type Distribution Model

(1) Passenger

Passenger trips are divided into two types: private vehicle (car) and public utility vehicle (jeepney and bus).

By the regression analysis of the present pattern, the following model was developed to estimate the car share:

$$\text{Car Share (\%)} = 19.6 + 0.0776 S^{0.972} - 1.517 \times 10^{-9} / I^{6.858}$$

where, S = travel speed (km/hr)

I = Per capita GRDP (1,000 peso), average of the values at origin/destination zones.

Passenger share between jeepney and bus is generally dependent on distance, therefore no significant relation with other factors was found. The present share was assumed to be maintained in the future.

(2) Commodity

Commodity is carried not only by trucks, but also by cars (pick-ups/vans). The present shares of car and truck was assumed to be maintained in the future. The shares are shown in Table 9.1-1.

TABLE 9.1-1 COMMODITY SHARE BETWEEN CAR AND TRUCK (%)

	Agricultural Products		Manufactured Products		Mineral Products		Construction Materials		Total	
	Car	Truck	Car	Truck	Car	Truck	Car	Truck	Car	Truck
Panay	7.3	92.7	11.4	88.6	0.0	100.0	0.4	99.6	6.5	93.5
Negros	2.4	97.6	8.5	91.5	0.3	99.7	4.3	95.7	4.1	95.9
Cebu	10.5	89.5	19.5	80.5	4.2	95.8	2.3	97.7	7.8	92.2
Samar/Leyte	8.1	91.9	8.5	91.5	1.3	98.7	2.0	98.0	5.1	94.9
Mindanao	4.6	95.4	4.2	95.8	1.3	98.7	0.6	99.4	3.2	96.8
Average	5.1	94.9	9.9	90.1	1.6	98.4	1.9	98.1	5.0	95.0

9.1.5 Average Occupancy and Load

(1) Average Occupancy

The average occupancies (number of passengers per vehicle) at present are shown in Table 9.1-2. The future average occupancies are assumed to be almost the same as present.

TABLE 9.1-2 AVERAGE NUMBER OF PASSENGERS PER VEHICLE

	Car	Jeepney	Bus
Panay	4.8	13.5	34.8
Negros	2.9	16.2	38.3
Cebu	2.9	17.8	44.9
Samar/Leyte	3.2	14.6	32.2
Mindanao	3.6	16.3	44.9
Average	3.3	15.9	41.2

(2) Average Load

The average loads (average number of tons of commodity per vehicle) at present are shown in Table 9.1-3. These figures were including empty vehicles on the way back and passenger loaded vehicles.

TABLE 9.1-3 AVERAGE LOAD INCLUDING EMPTY VEHICLES AND PASSENGER LOADED VEHICLES (ton)

	Car					Truck				
	Agric. Prod.	Manuf'd Prod.	Minera l Prod.	Const'n Mat'ls	Total	Agric. Prod.	Manuf'd Prod.	Mineral Prod.	Const'n Mat'ls	Total
Panay	0.25	0.11	0.02	0.06	0.14	4.54	3.22	4.29	4.44	4.02
Negros	0.12	0.13	0.03	0.22	0.13	4.83	3.20	3.32	3.55	4.02
Cebu	0.07	0.07	0.07	0.07	0.07	1.80	2.19	3.46	5.31	3.15
Samar/Leyte	0.12	0.10	0.09	0.18	0.10	2.21	1.88	4.35	3.40	2.58
Mindanao	0.08	0.06	0.12	0.15	0.05	2.65	2.69	3.44	5.12	3.09
Average	0.10	0.08	0.08	0.09	0.08	3.28	2.66	3.57	4.75	3.36

The present average loads are assumed to be maintained in the future.

9.2 FUTURE OD MATRIX

9.2.1 Kinds of OD Matrix

(1) Target Year

Target years were set at 2004, 2010 and 2016.

(2) Without and With Project Cases

Future OD matrices were prepared for two cases: "without project case" and "with project case". "Without project case" is the case assuming that the present road conditions would not change in the future, while in the "with project case", it was assumed that all the component roads of the Basic Road Network described in Chapter 12 would be improved.

(3) Kind

Kinds of OD matrices are as follows:

1. Vehicle
 - 1-1 Car
 - 1-2 Jeepney
 - 1-3 Bus
 - 1-4 Truck
2. Passenger
 - 2-1 Passenger
3. Commodity
 - 3-1 Agricultural products
 - 3-2 Manufactured products
 - 3-3 Mineral products
 - 3-4 Construction materials

9.2.2 Passenger Trip

Table 9.2-1 summarizes the total number of passenger trips, distribution among vehicle types and their trip growth rates.

It was estimated that total number of passenger trips would increase 2.45 times in 2016 over the present and car share would change from 17.3% at present to 26.7% in 2016.

Table 9.2-1 Number of Passenger Trips and Vehicle Type Distribution (1/4)
() : Growth Rate against 1997 W/O Value

Island	Total Number of Trips			Share (%)	
	Car	Jeepney	Bus	Total	Car Jeep y Bus
Marinduque	895 (1,000)	10,569 (1,000)	781 (1,000)	12,245 (1,000)	7.3 86.3 6.4
Mindoro	9,315 (1,000)	50,502 (1,000)	25,132 (1,000)	84,949 (1,000)	11.0 59.5 29.6
Palawan	1,484 (1,000)	5,586 (1,000)	5,577 (1,000)	12,588 (1,000)	11.8 44.4 43.8
Romblon	816 (1,000)	7,823 (1,000)	9,037 (1,000)	17,676 (1,000)	9.0 86.5 4.4
Catanduanes	1,222 (1,000)	5,364 (1,000)	3,274 (1,000)	9,860 (1,000)	12.4 54.4 33.2
Masbate	1,905 (1,000)	11,811 (1,000)	1,553 (1,000)	15,269 (1,000)	12.5 77.4 10.2
1 Panay	67,544 (1,000)	346,951 (1,000)	74,511 (1,000)	489,005 (1,000)	13.8 71.0 15.2
9 Guimaras	1,886 (1,000)	13,860 (1,000)	- (1,000)	15,746 (1,000)	12.0 88.0 .0
7 Negros	60,350 (1,000)	214,203 (1,000)	105,849 (1,000)	380,412 (1,000)	15.9 56.3 27.8
W Bohol	7,803 (1,000)	24,790 (1,000)	40,823 (1,000)	73,416 (1,000)	10.4 34.0 55.6
0 Cebu	188,966 (1,000)	461,538 (1,000)	128,369 (1,000)	778,893 (1,000)	24.3 59.3 16.5
Siquijor	2,270 (1,000)	2,425 (1,000)	- (1,000)	4,695 (1,000)	48.3 51.7 .0
Samar/Leyte	21,615 (1,000)	85,518 (1,000)	72,293 (1,000)	179,426 (1,000)	12.0 47.7 40.3
Mindanao	179,973 (1,000)	509,452 (1,000)	389,835 (1,000)	1,079,259 (1,000)	16.7 47.2 35.1
Camiguin	1,892 (1,000)	20,810 (1,000)	43 (1,000)	22,745 (1,000)	8.3 91.5 .2
Total	547,746 (1,000)	1,771,224 (1,000)	848,175 (1,000)	3,167,146 (1,000)	17.3 55.9 26.8

Table 9.2-1 Number of Passenger Trips and Vehicle Type Distribution (2/4)
() : Growth Rate against 1997 W/O Value

Island	Total Number of Trips			Share (%)	
	Car	Jeepney	Bus	Total	Car Jeep y Bus
Marinduque	3,209 (3,595)	12,382 (1,172)	924 (1,349)	16,515 (1,349)	19.4 75.0 5.6
Mindoro	22,685 (2,435)	60,258 (1,193)	29,954 (1,329)	112,898 (1,329)	20.1 53.4 26.5
Palawan	3,934 (2,650)	7,441 (1,332)	7,780 (1,410)	19,155 (1,522)	20.5 38.8 40.6
Romblon	2,343 (2,871)	9,139 (1,162)	9,139 (1,324)	20,611 (1,324)	19.6 78.4 4.0
Catanduanes	3,063 (2,502)	7,102 (1,224)	3,666 (1,211)	14,176 (1,433)	21.6 50.3 28.1
Masbate	3,107 (2,581)	15,896 (1,432)	2,224 (1,521)	23,227 (1,521)	22.0 68.4 9.6
2 Panay	151,597 (2,244)	394,376 (1,137)	87,469 (1,174)	633,442 (1,295)	23.9 62.3 13.8
0 Guimaras	4,167 (2,209)	15,950 (1,151)	- (,000)	20,117 (1,278)	20.7 79.3 .0
4 Negros	125,663 (2,082)	257,474 (1,249)	129,594 (1,224)	522,730 (1,374)	24.0 51.2 24.8
W Bohol	20,698 (2,722)	29,300 (1,182)	47,595 (1,172)	97,592 (1,337)	21.2 30.0 48.8
0 Cebu	303,356 (3,248)	594,985 (3,461)	161,732 (1,260)	1,060,073 (1,361)	28.6 56.1 15.3
Siquijor	3,248 (3,431)	3,461 (1,430)	- (,000)	6,715 (1,430)	48.4 51.6 .0
Samar/Leyte	60,168 (2,784)	198,814 (1,272)	91,995 (1,273)	290,981 (1,455)	23.1 41.7 35.3
Mindanao	372,618 (5,250)	648,375 (2,142)	486,525 (1,274)	1,517,518 (1,406)	24.6 42.7 32.7
Camiguin	5,250 (2,775)	21,142 (1,016)	43 (1,000)	26,435 (1,162)	19.9 80.0 .2
Total	1,087,102 (2,195)	2,195,101 (1,240)	1,060,289 (1,250)	4,343,491 (1,371)	25.0 50.6 24.4
Marinduque	4,580 (5,085)	16,745 (1,584)	1,267 (1,843)	22,572 (1,843)	20.2 74.2 5.6
Mindoro	29,443 (3,161)	70,444 (1,395)	40,876 (1,657)	140,764 (1,657)	20.9 50.0 29.0
Palawan	10,282 (6,926)	15,349 (2,748)	21,718 (3,936)	47,349 (3,762)	21.7 32.4 45.9
Romblon	3,595 (4,406)	12,696 (1,622)	754 (1,904)	17,045 (1,886)	21.1 74.5 4.4
Catanduanes	3,766 (3,082)	8,552 (1,594)	4,652 (1,421)	16,970 (1,721)	22.2 50.4 27.4
Masbate	6,339 (3,327)	19,013 (1,610)	2,932 (1,888)	28,284 (1,852)	22.4 67.2 10.4
2 Panay	187,662 (2,778)	464,877 (1,340)	109,156 (1,485)	761,695 (1,538)	24.6 51.0 14.3
0 Guimaras	5,245 (2,791)	18,896 (1,363)	- (,000)	24,141 (1,533)	21.7 78.3 .0
4 Negros	142,449 (2,360)	297,924 (1,391)	149,005 (1,408)	589,379 (1,549)	24.2 50.5 25.3
W Bohol	26,206 (3,447)	35,331 (1,421)	57,719 (1,633)	119,257 (1,633)	22.0 29.6 48.4
0 Cebu	341,611 (1,808)	681,489 (1,423)	183,432 (1,523)	1,186,533 (1,523)	28.8 55.7 15.5
Siquijor	3,941 (1,736)	4,118 (1,698)	- (,000)	8,059 (1,716)	48.9 51.1 .0
Samar/Leyte	76,865 (3,556)	136,023 (1,591)	113,664 (1,572)	326,552 (1,820)	23.5 41.7 34.8
Mindanao	479,230 (2,653)	815,570 (1,601)	653,330 (1,625)	1,928,131 (1,737)	24.9 42.3 32.8
Camiguin	6,539 (3,456)	25,133 (1,208)	31,722 (1,163)	63,393 (1,395)	20.6 79.2 .2
Total	1,327,734 (2,424)	2,802,162 (1,468)	1,318,606 (1,555)	5,248,502 (1,657)	25.3 49.6 25.1

Table 9.2-1 Number of Passenger Trips and Vehicle Type Distribution (3/4)
() : Growth Rate against 1997 W/O Value

Island	Total Number of Trips				Share (%)	
	Car	Jeepney	Bus	Total	Car	Jeepney
Marinduque	4,353 (4.897)	14,775 (1,398)	1,105 (1,415)	20,253 (1,655)	21.6	72.9
Mindoro	30,095 (3,231)	72,366 (1,433)	35,775 (1,627)	138,236 (1,830)	21.8	52.3
Palawan	5,558 (3,744)	9,512 (1,703)	10,256 (1,850)	25,327 (2,012)	21.9	37.6
Romblon	3,102 (3,802)	10,759 (1,375)	1,577 (1,457)	14,439 (1,598)	21.5	74.5
Catanduanes	4,106 (3,362)	8,901 (1,659)	4,894 (1,485)	17,903 (1,816)	23.0	49.7
Masbate	7,121 (3,710)	20,458 (1,805)	2,958 (2,000)	30,546 (2,000)	23.3	67.0
2 Panay	192,861 (2,856)	464,248 (1,249)	103,312 (1,387)	761,421 (1,557)	25.3	61.1
0 Guimaras	5,303 (2,812)	18,951 (1,346)	- (0.000)	23,954 (1,521)	22.1	77.9
0 Negros	161,907 (2,682)	327,964 (1,531)	157,240 (1,486)	647,111 (1,701)	25.0	50.7
W Bohol	26,764 (3,520)	34,940 (1,409)	56,744 (1,397)	118,449 (1,522)	22.6	29.5
0 Cebu	377,907 (2,000)	733,596 (1,589)	198,345 (1,545)	1,309,848 (1,862)	28.9	56.0
Siqui-jor	4,122 (1,816)	4,399 (1,814)	- (0.000)	8,521 (1,815)	48.4	51.6
Samar/Leyte	81,274 (3,760)	136,164 (1,582)	115,027 (1,591)	332,465 (1,853)	24.4	41.0
Mindanao	497,585 (2,765)	803,129 (1,776)	616,134 (1,776)	1,916,849 (1,776)	26.0	41.9
Camiguin	6,451 (3,410)	22,951 (1,103)	46 (1,070)	29,448 (1,295)	21.9	77.9
Total	1,408,593 (2,572)	2,683,493 (1,515)	1,302,414 (1,536)	5,394,500 (1,703)	26.1	49.7
Marinduque	6,215 (6,944)	20,028 (1,895)	1,520 (1,946)	27,763 (2,267)	22.4	72.1
Mindoro	39,035 (4,191)	84,765 (1,678)	48,830 (1,943)	172,629 (2,032)	22.6	49.1
Palawan	14,626 (9,853)	19,760 (3,538)	29,808 (5,221)	63,193 (5,020)	23.1	31.3
Romblon	4,746 (5,817)	15,056 (1,924)	919 (2,321)	20,722 (2,293)	22.9	72.7
Catanduanes	5,050 (4,132)	10,721 (1,999)	5,742 (2,182)	21,513 (2,443)	23.5	49.8
Masbate	8,860 (4,651)	24,449 (2,070)	3,997 (2,574)	37,306 (2,443)	23.7	65.5
2 Panay	238,411 (3,530)	548,180 (1,580)	128,855 (1,729)	915,456 (1,872)	26.0	59.9
0 Guimaras	6,650 (3,526)	22,084 (1,594)	- (0.000)	28,744 (1,825)	23.1	76.9
0 Negros	184,229 (3,053)	366,446 (1,711)	181,311 (1,924)	732,035 (1,924)	25.2	50.1
W Bohol	33,811 (4,447)	42,107 (1,699)	58,828 (1,694)	144,747 (1,694)	23.4	29.1
T Cebu	476,103 (5,000)	815,712 (1,767)	225,142 (1,754)	1,466,957 (1,882)	29.0	55.6
H Siqui-jor	5,003 (2,003)	5,255 (2,155)	- (0.000)	10,258 (2,178)	48.9	51.1
Samar/Leyte	104,226 (4,822)	171,024 (2,090)	142,917 (1,976)	418,077 (2,350)	24.9	40.9
Mindanao	641,888 (3,564)	1,012,115 (1,967)	787,807 (2,021)	2,441,450 (2,262)	26.3	41.5
Camiguin	8,008 (4,233)	27,275 (1,311)	34 (1,256)	35,337 (1,554)	22.7	77.2
Total	1,726,497 (3,152)	3,185,018 (1,798)	1,624,539 (1,915)	6,536,155 (2,064)	26.4	48.7

Table 9.2-1 Number of Passenger Trips and Vehicle Type Distribution (4/4)
() : Growth Rate against 1997 W/O Value

Island	Total Number of Trips				Share (%)	
	Car	Jeepney	Bus	Total	Car	Jeepney
Marinduque	5,321 (5,945)	17,298 (1,637)	1,295 (1,658)	23,914 (1,953)	22.3	72.3
Mindoro	36,463 (3,915)	85,446 (1,692)	42,032 (1,830)	163,941 (1,930)	22.2	52.1
Palawan	7,080 (7,744)	11,733 (2,338)	12,900 (2,519)	31,713 (3,202)	22.3	37.0
Romblon	3,693 (4,026)	12,401 (1,885)	665 (1,585)	15,760 (1,885)	22.0	74.0
Catanduanes	5,024 (4,111)	10,888 (1,993)	5,852 (1,793)	21,574 (2,188)	23.3	49.5
Masbate	8,950 (9,698)	25,194 (2,133)	3,722 (2,397)	37,866 (2,480)	23.6	66.5
2 Panay	226,865 (3,359)	536,910 (1,548)	119,845 (1,596)	882,730 (1,855)	25.7	60.8
0 Guimaras	5,207 (3,201)	21,529 (1,539)	- (0.000)	27,535 (1,749)	22.5	77.5
0 Negros	192,168 (3,193)	397,358 (1,808)	182,997 (1,728)	763,093 (2,006)	25.3	50.8
W Bohol	31,574 (4,153)	40,397 (1,630)	65,618 (1,884)	137,589 (1,884)	22.9	29.4
0 Cebu	446,467 (2,353)	868,983 (1,883)	234,024 (1,823)	1,549,474 (1,989)	28.8	56.1
Siqui-jor	4,970 (4,194)	5,395 (1,894)	- (0.000)	10,275 (2,189)	48.4	51.6
Samar/Leyte	99,474 (3,760)	163,212 (1,908)	138,206 (1,912)	400,891 (2,234)	24.8	40.7
Mindanao	607,994 (3,378)	957,587 (1,890)	736,657 (1,839)	2,302,238 (2,133)	26.4	41.6
Camiguin	6,451 (3,410)	22,951 (1,103)	46 (1,070)	29,448 (1,295)	21.9	77.9
Total	1,690,983 (3,086)	3,168,655 (1,789)	1,542,963 (1,819)	6,401,741 (2,021)	26.4	49.5
Marinduque	7,550 (8,436)	23,490 (2,223)	1,785 (2,283)	32,825 (2,681)	23.0	71.6
Mindoro	47,304 (5,078)	100,182 (1,984)	57,389 (2,284)	204,875 (2,412)	23.1	48.9
Palawan	18,735 (12,62)	24,500 (4,386)	36,403 (6,588)	79,637 (6,327)	23.5	30.8
Romblon	5,660 (6,937)	17,421 (2,225)	1,070 (2,702)	24,151 (2,672)	23.4	72.1
Catanduanes	6,172 (5,051)	12,875 (2,400)	6,879 (2,101)	25,926 (2,629)	23.8	49.7
Masbate	11,159 (5,858)	30,069 (2,545)	5,107 (3,288)	46,335 (3,034)	24.1	64.9
2 Panay	280,348 (4,151)	633,218 (1,825)	148,368 (1,990)	1,061,874 (2,171)	26.4	59.6
0 Guimaras	7,777 (4,123)	25,265 (1,623)	- (0.000)	33,042 (2,098)	23.5	75.5
0 Negros	220,107 (3,647)	434,142 (2,027)	211,570 (1,989)	865,820 (2,276)	25.4	50.1
W Bohol	39,863 (5,243)	48,661 (1,963)	79,590 (1,959)	168,114 (2,002)	23.7	28.9
T Cebu	503,528 (3,658)	968,919 (2,094)	265,866 (2,071)	1,738,213 (2,200)	29.0	55.7
H Siqui-jor	6,000 (2,557)	6,309 (2,598)	- (0.000)	12,309 (2,825)	48.9	51.1
Samar/Leyte	127,633 (4,822)	205,586 (2,090)	172,126 (1,976)	505,345 (2,350)	25.3	40.7
Mindanao	785,125 (3,564)	1,208,386 (1,967)	940,386 (2,021)	2,933,937 (2,262)	26.7	41.1
Camiguin	8,008 (4,233)	27,275 (1,311)	34 (1,256)	35,337 (1,554)	22.7	77.2
Total	2,076,588 (3,791)	3,766,379 (1,798)	1,929,538 (2,275)	7,772,505 (2,454)	26.7	48.5

9.2.3 Commodity Movement

Table 9.2-2 summarizes the commodity movement. The estimated growth rates from 1997 to 2016 are as follows:

Agricultural products	:	1.76
Manufactured products	:	4.43
Mineral products	:	2.78
Construction materials	:	3.69
All commodity	:	2.99

9.2.4 Vehicle Trip

Table 9.2-3 shows the total number of vehicle trips and total vehicle-km by vehicle type for each year. The estimated growth rates from 1997 to 2016 are as follows:

	<u>Number of trips</u>	<u>Vehicle-km</u>
Car	3.80	4.44
Jeepney	2.11	2.37
Bus	2.26	2.42
Truck	3.01	3.17
All vehicle	3.05	3.44

Figure 9.2-1 illustrates inter-zonal traffic demand (desire line) in 2016.

Table 9.2-2 Commodity Movement and Vehicle Type Distribution (1/4) Growth Rate against 1997 W/O Value

Island	Total Movement (ton)				Share (%)	Car Truck
	Agricult. Products	Manufact. Products	Mineral Products	Const. Materials		
Marinduque	274 (1,000)	181 (1,000)	32 (1,000)	114 (1,000)	601 (1,000)	5.6 94.4
Mindoro	1,395 (1,000)	901 (1,000)	174 (1,000)	626 (1,000)	3,096 (1,000)	5.5 94.5
Palawan	542 (1,000)	350 (1,000)	125 (1,000)	375 (1,000)	1,392 (1,000)	5.0 95.0
Romblon	346 (1,000)	237 (1,000)	85 (1,000)	369 (1,000)	1,037 (1,000)	4.9 95.1
Catanduanes	372 (1,000)	307 (1,000)	63 (1,000)	228 (1,000)	970 (1,000)	5.5 94.5
Masbate	301 (1,000)	353 (1,000)	46 (1,000)	279 (1,000)	1,079 (1,000)	5.7 94.3
Panay	16,669 (1,000)	6,166 (1,000)	3,231 (1,000)	3,895 (1,000)	29,961 (1,000)	6.5 93.5
Guimaras	461 (1,000)	228 (1,000)	43 (1,000)	170 (1,000)	901 (1,000)	5.4 94.6
Negros	37,620 (1,000)	16,208 (1,000)	4,136 (1,000)	6,547 (1,000)	64,511 (1,000)	4.1 95.9
Bohol	1,477 (1,000)	1,285 (1,000)	246 (1,000)	1,101 (1,000)	4,109 (1,000)	5.3 94.7
Cebu	10,946 (1,000)	12,843 (1,000)	5,523 (1,000)	29,177 (1,000)	58,488 (1,000)	7.8 92.2
Siquijor	396 (1,000)	364 (1,000)	57 (1,000)	235 (1,000)	1,053 (1,000)	5.7 94.3
Samar/Leyte	3,505 (1,000)	3,486 (1,000)	1,298 (1,000)	4,902 (1,000)	13,191 (1,000)	5.1 94.9
Mindanao	34,999 (1,000)	21,801 (1,000)	9,483 (1,000)	18,221 (1,000)	84,504 (1,000)	3.2 96.8
Camiguin	338 (1,000)	191 (1,000)	56 (1,000)	150 (1,000)	735 (1,000)	5.3 94.7
Total	109,641 (1,000)	64,898 (1,000)	24,599 (1,000)	66,322 (1,000)	265,461 (1,000)	5.0 95.0

Table 9.2-2 Commodity Movement and Vehicle Type Distribution (2/4) Growth Rate against 1997 W/O Value

Island	Total Movement (ton)				Share (%)	Car Truck
	Agricult. Products	Manufact. Products	Mineral Products	Const. Materials		
Marinduque	349 (1,272)	298 (1,589)	54 (1,656)	181 (1,466)	882 (1,466)	5.7 94.3
Mindoro	1,768 (1,691)	1,524 (1,691)	284 (1,634)	1,028 (1,487)	4,604 (1,487)	5.6 94.4
Palawan	806 (1,487)	595 (1,699)	200 (1,597)	644 (1,718)	2,244 (1,612)	5.0 95.0
Romblon	411 (1,189)	389 (1,643)	125 (1,473)	485 (1,456)	1,410 (1,515)	4.9 95.1
Catanduanes	497 (1,335)	545 (1,779)	86 (1,508)	377 (1,561)	1,515 (1,561)	5.7 94.3
Masbate	512 (1,700)	618 (1,751)	87 (1,895)	457 (1,641)	1,674 (1,711)	5.7 94.3
Panay	19,503 (1,170)	11,512 (1,667)	4,735 (1,418)	6,569 (1,586)	42,359 (1,414)	6.6 93.4
Guimaras	540 (1,173)	404 (1,783)	60 (1,566)	296 (1,499)	1,298 (1,511)	5.6 94.4
Negros	41,420 (1,101)	30,204 (1,864)	6,021 (1,790)	11,129 (1,700)	88,774 (1,378)	4.7 95.3
Bohol	1,933 (1,309)	2,265 (1,762)	397 (1,617)	1,790 (1,554)	6,385 (1,554)	5.5 94.5
Cebu	13,638 (1,246)	26,930 (1,881)	9,410 (1,704)	54,869 (1,793)	104,847 (1,793)	8.0 92.0
Siquijor	477 (1,203)	697 (1,914)	89 (1,560)	403 (1,412)	1,667 (1,582)	6.1 93.9
Samar/Leyte	5,456 (1,557)	6,255 (1,794)	2,059 (1,587)	8,308 (1,695)	22,079 (1,674)	5.2 94.8
Mindanao	44,349 (1,267)	39,584 (1,459)	13,838 (1,459)	31,776 (1,744)	129,547 (1,533)	3.4 96.6
Camiguin	369 (1,090)	303 (1,595)	72 (1,296)	226 (1,510)	971 (1,320)	5.5 94.5
Total	192,027 (1,204)	122,122 (1,882)	37,575 (1,527)	118,530 (1,787)	410,254 (1,545)	5.4 94.6
Marinduque	460 (1,678)	398 (2,145)	71 (2,201)	224 (1,967)	1,143 (1,901)	5.8 94.2
Mindoro	2,557 (1,830)	2,227 (2,467)	390 (2,137)	1,338 (2,102)	6,507 (2,102)	5.7 94.3
Palawan	1,228 (2,228)	915 (2,514)	265 (2,320)	921 (2,320)	3,228 (2,320)	5.3 94.7
Romblon	654 (1,854)	540 (1,812)	153 (1,950)	588 (1,835)	1,835 (1,835)	5.1 94.9
Catanduanes	577 (1,350)	649 (1,870)	112 (1,870)	426 (1,809)	1,755 (1,809)	5.7 94.3
Masbate	660 (2,191)	732 (2,076)	104 (2,273)	536 (2,077)	2,032 (2,077)	5.7 94.3
Panay	22,211 (1,332)	13,695 (2,221)	5,605 (1,785)	7,716 (1,981)	49,226 (1,643)	6.7 93.3
Guimaras	622 (1,350)	485 (2,140)	82 (1,879)	343 (2,013)	1,531 (1,699)	5.6 94.4
Negros	43,553 (1,158)	31,772 (1,960)	6,371 (1,541)	11,625 (1,776)	93,321 (1,447)	4.7 95.3
Bohol	2,330 (1,578)	2,771 (2,166)	482 (1,962)	2,123 (1,875)	7,706 (1,875)	5.5 94.5
Cebu	14,796 (1,352)	28,787 (2,242)	10,013 (1,813)	57,815 (1,982)	111,421 (1,905)	7.9 92.1
Siquijor	525 (1,324)	783 (2,152)	100 (1,748)	439 (1,866)	1,848 (1,754)	6.1 93.9
Samar/Leyte	6,512 (1,868)	7,488 (2,150)	2,470 (1,904)	9,365 (1,915)	25,864 (1,961)	5.3 94.7
Mindanao	51,917 (1,483)	46,739 (2,147)	16,313 (1,720)	36,018 (1,720)	151,048 (1,787)	3.4 96.6
Camiguin	427 (1,262)	364 (1,901)	67 (1,556)	272 (1,812)	1,149 (1,556)	5.5 94.5
Total	148,827 (1,356)	138,399 (2,133)	42,620 (1,733)	129,670 (1,955)	459,515 (1,731)	5.3 94.7

Table 9.2-2 Commodity Movement and Vehicle Type Distribution (3/4)
() : Growth Rate against 1997 W/O Value

Island	Total Movement (ton)				Share (%)
	Agricult. Products	Manufact. Products	Mineral Products	Const. Materials	
Marinduque	415 (1.512)	409 (2.263)	73 (2.242)	241 (2.113)	1.137 (1.891)
Mindoro	2.118 (1.518)	1.395 (2.227)	1.395 (2.227)	6.023 (1.945)	6.023 (2.357)
Palawan	1.033 (1.966)	841 (2.402)	908 (2.192)	3.051 (1.168)	3.051 (2.774)
Romblon	1.468 (1.354)	530 (2.337)	643 (2.133)	1.799 (1.857)	2.145 (2.213)
Catanduanes	1.607 (1.620)	2.802 (2.615)	124 (1.965)	2.051 (2.270)	2.608 (2.688)
Masbate	2.271 (2.271)	2.569 (2.569)	2.127 (2.127)	2.346 (2.346)	3.041 (3.041)
Panay	22.131 (1.328)	17.315 (1.909)	6.169 (1.909)	9.111 (2.339)	67.550 (2.255)
Guimaras	618 (1.347)	2.609 (2.609)	91 (2.090)	591 (2.315)	2.092 (2.270)
Negros	44.298 (1.177)	45.307 (2.795)	7.630 (1.845)	15.495 (2.367)	136.870 (2.122)
Bohol	2.360 (1.598)	3.284 (2.556)	537 (2.184)	2.420 (2.198)	10.847 (2.840)
Cebu	15.806 (1.444)	44.095 (3.433)	13.358 (2.814)	82.113 (2.814)	210.725 (3.603)
Siquijor	1.559 (1.409)	1.072 (2.943)	119 (2.070)	564 (2.397)	3.017 (2.864)
Samar/Leyte	6.973 (1.990)	9.131 (2.619)	2.732 (2.105)	11.398 (2.325)	38.025 (2.883)
Mindanao	52.429 (1.498)	58.620 (2.689)	17.618 (1.858)	45.164 (2.479)	218.232 (2.583)
Camiaguin	1.393 (1.161)	2.404 (2.109)	84 (1.514)	288 (1.924)	1.338 (1.819)
Total	150.890 (1.376)	185.489 (2.858)	49.474 (2.011)	171.282 (2.583)	709.118 (2.671)
Marinduque	1.994 (3.076)	532 (2.943)	97 (2.975)	298 (1.814)	1.785 (2.988)
Mindoro	3.076 (2.205)	3.096 (3.437)	530 (3.043)	8.516 (2.897)	10.448 (3.375)
Palawan	1.576 (2.908)	1.296 (3.703)	390 (2.873)	4.381 (3.083)	5.551 (3.988)
Romblon	634 (1.852)	733 (3.094)	195 (2.303)	778 (2.581)	2.786 (2.876)
Catanduanes	1.706 (1.895)	941 (3.068)	146 (2.309)	586 (2.451)	3.025 (3.118)
Masbate	1.888 (2.948)	1.073 (3.042)	153 (3.338)	739 (2.649)	3.701 (3.782)
Panay	25.361 (1.521)	20.633 (3.347)	7.246 (2.242)	10.697 (2.746)	79.029 (2.638)
Guimaras	1.715 (1.552)	709 (3.130)	109 (2.507)	472 (2.226)	2.484 (2.758)
Negros	46.669 (1.241)	47.633 (2.939)	8.083 (1.954)	16.187 (2.473)	144.030 (2.233)
Bohol	2.847 (1.928)	4.015 (3.124)	650 (2.946)	2.872 (2.608)	13.095 (3.187)
Cebu	17.194 (1.511)	47.102 (3.668)	14.189 (2.569)	86.472 (2.964)	223.596 (3.823)
Siquijor	618 (1.559)	1.203 (3.304)	203 (2.323)	615 (2.612)	3.354 (3.184)
Samar/Leyte	8.356 (3.294)	10.915 (2.522)	3.272 (2.522)	12.862 (3.624)	44.519 (3.375)
Mindanao	61.692 (1.753)	59.102 (3.170)	20.790 (2.192)	51.046 (2.801)	254.219 (3.608)
Camiaguin	1.435 (1.348)	2.465 (2.531)	345 (1.816)	345 (2.308)	1.590 (2.162)
Total	171.333 (1.563)	209.466 (3.228)	56.054 (2.279)	186.941 (2.819)	793.211 (2.988)

Table 9.2-2 Commodity Movement and Vehicle Type Distribution (4/4)
() : Growth Rate against 1997 W/O Value

Island	Total Movement (ton)				Share (%)
	Agricult. Products	Manufact. Products	Mineral Products	Const. Materials	
Marinduque	481 (1.756)	512 (2.776)	90 (2.587)	295 (2.587)	1.378 (2.252)
Mindoro	2.488 (1.783)	2.689 (2.985)	480 (2.738)	1.732 (2.766)	7.389 (3.367)
Palawan	1.264 (2.334)	1.089 (3.113)	339 (2.708)	3.861 (3.116)	5.095 (2.774)
Romblon	525 (1.517)	655 (2.766)	187 (2.206)	778 (2.580)	2.145 (2.213)
Catanduanes	1.934 (1.934)	3.397 (2.397)	152 (2.397)	653 (2.864)	2.608 (2.688)
Masbate	2.821 (2.821)	3.471 (3.471)	167 (2.821)	2.800 (3.041)	3.041 (3.041)
Panay	24.777 (1.486)	23.760 (3.854)	7.450 (2.969)	11.563 (2.255)	67.550 (2.255)
Guimaras	618 (1.517)	2.609 (2.609)	91 (2.090)	591 (2.315)	2.092 (2.270)
Negros	44.298 (1.177)	45.307 (2.795)	7.630 (1.845)	15.495 (2.367)	136.870 (2.122)
Bohol	2.360 (1.598)	3.284 (2.556)	537 (2.184)	2.420 (2.198)	10.847 (2.840)
Cebu	15.806 (1.444)	44.095 (3.433)	13.358 (2.814)	82.113 (2.814)	210.725 (3.603)
Siquijor	1.559 (1.409)	1.072 (2.943)	119 (2.070)	564 (2.397)	3.017 (2.864)
Samar/Leyte	6.973 (1.990)	9.131 (2.619)	2.732 (2.105)	11.398 (2.325)	38.025 (2.883)
Mindanao	52.429 (1.498)	58.620 (2.689)	17.618 (1.858)	45.164 (2.479)	218.232 (2.583)
Camiaguin	1.393 (1.161)	2.404 (2.109)	84 (1.514)	288 (1.924)	1.338 (1.819)
Total	188.597 (1.535)	255.100 (3.931)	60.518 (2.450)	224.902 (3.391)	709.118 (2.671)
Marinduque	634 (3.681)	665 (3.681)	120 (3.681)	365 (3.204)	1.785 (2.988)
Mindoro	3.623 (2.507)	3.443 (3.443)	560 (3.700)	2.253 (3.598)	10.448 (3.375)
Palawan	1.929 (3.761)	1.681 (4.804)	454 (3.626)	1.467 (3.965)	5.551 (3.988)
Romblon	711 (2.058)	803 (3.815)	250 (2.753)	941 (3.122)	2.786 (2.876)
Catanduanes	1.898 (2.251)	1.451 (4.142)	178 (2.814)	739 (3.241)	3.025 (3.118)
Masbate	1.898 (3.682)	1.451 (4.115)	203 (4.419)	938 (3.363)	3.701 (3.782)
Panay	28.532 (1.712)	28.172 (4.569)	8.754 (2.709)	13.571 (3.484)	79.029 (2.638)
Guimaras	1.812 (1.764)	709 (4.172)	135 (3.103)	472 (2.226)	2.484 (2.758)
Negros	49.333 (1.312)	49.600 (2.939)	9.536 (2.306)	20.552 (3.139)	144.030 (2.233)
Bohol	3.388 (2.294)	5.326 (3.243)	809 (3.243)	3.572 (3.243)	13.095 (3.187)
Cebu	19.367 (1.769)	68.936 (3.368)	18.456 (2.964)	116.836 (2.964)	223.596 (3.823)
Siquijor	722 (1.822)	1.681 (4.161)	164 (2.865)	786 (3.339)	3.354 (3.184)
Samar/Leyte	10.095 (3.880)	14.451 (4.145)	4.002 (3.083)	15.971 (3.258)	44.519 (3.375)
Mindanao	61.692 (1.753)	70.843 (2.451)	24.683 (2.603)	56.018 (3.608)	254.219 (3.608)
Camiaguin	1.435 (1.422)	2.465 (3.091)	345 (2.007)	345 (2.703)	1.590 (2.162)
Total	192.429 (1.755)	287.259 (4.428)	68.486 (2.784)	245.026 (3.894)	793.211 (2.988)

Table 9.2-3 Number of Vehicle Trips and Vehicle Type Distribution (1/4)

Island	Total Number of Trips				Total Vehicle-km				Number of Trip Share (%)				Vehicle-km Share (%)					
	Car		Bus		Jeepney		Truck		Total		Car		Jeepney		Truck		Total	
	Car	Jeepney	Bus	Truck	Car	Jeepney	Bus	Truck	Total	Car	Jeepney	Bus	Truck	Car	Jeepney	Bus	Truck	Total
Marikinaque	271	666	19	175	1,132	7,213	16,202	4,789	28,706	503	58.9	1.7	15.5	25.1	56.4	1.8	16.7	(1,000)
Mindoro	2,821	3,184	809	898	7,513	109,644	124,893	41,439	305,900	30,124	42.4	8.1	12.0	35.8	40.8	9.8	13.5	(1,000)
Palawan	450	352	134	392	1,328	47,666	29,334	19,783	131,453	19,783	26.5	10.1	29.6	36.3	22.3	15.0	26.4	(1,000)
Romblon	247	493	10	269	1,019	8,454	10,961	5,865	23,559	2,280	48.4	9	26.4	27.4	46.5	1.2	24.9	(1,000)
Catanduanes	370	338	79	280	1,068	9,412	7,112	4,310	21,644	4,310	31.7	7.4	26.2	34.0	25.7	15.6	24.6	(1,000)
Masbate	577	745	38	281	1,640	27,321	32,118	13,598	75,578	2,541	45.4	2.3	17.1	36.1	42.5	3.4	18.0	(1,000)
Panay	14,030	25,727	2,140	6,976	48,873	610,978	634,681	288,213	1,663,041	129,159	52.6	4.4	14.3	36.7	38.2	7.8	17.3	(1,000)
Guimaras	571	874	260	1,705	3,450	11,399	16,608	5,171	33,180	5,171	51.2	0	15.3	34.4	50.1	0	15.6	(1,000)
Negros	20,631	13,277	2,761	15,406	52,015	619,911	335,247	141,377	1,554,245	457,710	25.4	5.3	29.6	39.9	21.6	9.1	29.4	(1,000)
Bohol	2,302	1,563	985	1,175	6,026	83,934	44,712	47,415	224,554	47,415	16.3	19.5	37.4	37.4	19.9	21.1	21.6	(1,000)
Cebu	85,539	25,944	2,859	17,131	111,472	907,495	347,171	122,943	1,657,033	279,424	23.3	2.6	15.4	54.8	21.0	7.4	16.9	(1,000)
Siquijor	687	153	307	1,147	2,394	13,135	2,723	5,672	21,530	5,672	13.3	0	26.8	61.0	12.6	0	26.3	(1,000)
Samar/Leyte	6,777	5,851	2,246	4,856	19,730	386,589	245,832	168,473	1,056,032	255,138	11.4	24.6	36.6	36.6	23.3	16.0	24.2	(1,000)
Mindanao	50,054	31,241	8,687	26,506	116,488	3,077,503	1,543,048	802,719	7,166,563	1,743,293	26.8	7.5	22.8	42.9	21.5	11.2	24.3	(1,000)
Cebuigan	573	1,312	1	212	2,098	11,246	23,676	3,790	38,730	18	62.5	0	10.1	29.0	61.1	0	9.8	(1,000)
Total	185,900	111,562	20,566	75,126	373,254	5,929,901	3,414,129	1,469,644	14,007,748	3,194,075	29.9	5.5	20.1	42.3	24.4	10.5	22.8	(1,000)

Table 9. 2-3 Number of Vehicle Trips and Vehicle Type Distribution (2/4)

() : Growth Rate against 1997 W/O Value

Island	Total Number of Trips			Total Vehicle-km			Number of Trip Share (%)			Vehicle-km Share (%)		
	Car	Jeepney	Bus	Car	Jeepney	Bus	Car	Jeepney	Bus	Car	Jeepney	Bus
Marinduque	972 (3.95)	781 (1.72)	22 (1.13)	24,176 (1.88)	19,212 (1.58)	603 (1.19)	7,056 (1.78)	51,048 (1.78)	47.8 (38.4)	1.1 (12.7)	47.4 (37.6)	1.2 (13.8)
Mindoro	6,370 (2.36)	3,800 (1.93)	1,225 (1.26)	28,891 (2.82)	15,058 (1.55)	35,740 (3.55)	61,768 (3.18)	535,747 (2.71)	54.0 (29.8)	5.7 (10.5)	53.8 (28.0)	6.7 (11.5)
Palawan	1,191 (2.51)	409 (1.57)	136 (1.41)	137,563 (2.88)	41,726 (1.92)	28,152 (1.33)	57,651 (2.65)	264,592 (2.13)	48.0 (18.9)	7.6 (25.4)	52.0 (15.5)	10.6 (21.8)
Romblon	2,551 (2.72)	1,119 (1.52)	131 (1.58)	16,434 (2.88)	12,989 (1.85)	4,423 (1.43)	8,418 (2.65)	36,177 (2.13)	42.0 (34.1)	7 (23.1)	43.0 (34.0)	9 (22.0)
Catanduanes	2,872 (2.32)	1,068 (1.16)	96 (1.44)	30,270 (2.54)	9,494 (1.33)	5,289 (1.82)	10,846 (2.22)	55,896 (2.02)	48.5 (23.5)	5.0 (23.0)	54.1 (17.0)	9.5 (19.4)
Masbate	2,862 (2.92)	1,245 (1.24)	54 (1.82)	30,210 (2.82)	45,445 (3.89)	3,897 (1.53)	24,779 (2.22)	149,233 (1.97)	50.1 (32.5)	1.7 (15.7)	50.3 (30.5)	2.6 (16.6)
Panay	34,435 (2.92)	29,483 (2.55)	2,555 (1.94)	1,115,948 (2.82)	748,039 (1.78)	152,118 (1.78)	411,129 (2.42)	2,427,233 (1.46)	44.9 (38.8)	3.4 (13.0)	46.0 (30.8)	6.3 (16.9)
Guimaras	2,262 (2.51)	1,006 (1.41)	376 (1.44)	24,321 (2.40)	19,321 (1.63)	7,468 (1.54)	31,779 (1.54)	51,181 (1.54)	47.7 (38.0)	0 (14.2)	47.7 (37.8)	0 (14.0)
Negros	43,759 (2.32)	16,238 (1.77)	3,249 (1.43)	1,261,914 (2.82)	402,534 (2.01)	161,915 (1.45)	840,876 (2.65)	2,466,688 (1.58)	51.3 (19.0)	3.8 (25.9)	51.1 (16.3)	6.6 (26.0)
Bohol	6,258 (2.72)	1,848 (1.17)	153 (1.82)	250,567 (2.88)	53,007 (1.85)	55,473 (1.70)	75,659 (2.65)	434,702 (1.95)	56.4 (16.6)	10.4 (16.5)	57.6 (12.2)	12.8 (17.4)
Cebu	105,817 (2.72)	33,440 (1.82)	3,555 (1.73)	1,636,235 (2.88)	441,524 (1.85)	143,848 (1.70)	473,822 (2.65)	2,695,429 (1.82)	61.4 (19.4)	2.1 (17.1)	60.7 (16.4)	5.3 (17.6)
Siquijor	984 (1.43)	219 (1.43)	0 (0.00)	18,832 (2.40)	3,902 (1.33)	0 (0.00)	9,045 (1.55)	31,779 (1.55)	58.1 (12.9)	0 (29.0)	59.3 (12.3)	0 (28.5)
Samar/Leyte	19,436 (2.88)	7,364 (1.28)	2,915 (1.93)	1,036,702 (2.82)	319,440 (2.09)	210,741 (1.25)	430,259 (1.89)	1,997,142 (1.89)	51.4 (19.5)	7.7 (21.4)	51.9 (16.0)	10.6 (21.5)
Mindanao	106,004 (2.18)	39,406 (1.21)	1,481 (1.24)	6,334,844 (2.88)	1,985,209 (2.05)	991,575 (2.15)	2,719,881 (2.65)	12,032,509 (1.87)	54.2 (20.2)	5.5 (20.1)	52.6 (16.5)	8.2 (22.6)
Camiguin	1,590 (2.75)	1,333 (1.16)	1 (0.16)	26,323 (2.67)	24,344 (1.92)	1 (0.16)	5,014 (1.82)	58,698 (1.51)	49.6 (41.6)	0 (8.7)	50.0 (41.5)	0 (8.5)
Total	331,479 (1.99)	137,413 (2.32)	25,329 (1.53)	12,279,830 (2.07)	4,276,838 (1.53)	1,789,704 (1.21)	4,943,621 (2.65)	23,289,994 (1.66)	54.4 (22.5)	4.2 (18.9)	52.7 (18.4)	7.7 (21.2)
Marinduque	1,381 (5.86)	1,056 (1.34)	31 (1.32)	38,539 (3.43)	28,913 (1.78)	943 (1.85)	9,582 (2.01)	77,977 (2.71)	49.3 (37.7)	1.1 (12.0)	49.4 (37.1)	1.2 (12.3)
Mindoro	8,917 (3.16)	4,442 (1.39)	1,302 (1.23)	48,010 (4.59)	198,557 (1.95)	58,931 (2.58)	96,990 (3.41)	799,498 (2.81)	54.9 (27.3)	6.1 (11.7)	55.7 (24.8)	7.4 (12.1)
Palawan	3,114 (6.92)	968 (2.74)	327 (3.93)	48,136 (9.55)	108,927 (3.84)	37,517 (4.24)	96,313 (2.78)	731,886 (5.58)	56.3 (17.5)	9.5 (16.6)	60.3 (14.6)	12.0 (13.2)
Romblon	1,089 (4.47)	600 (1.82)	18 (1.93)	28,413 (9.25)	19,355 (2.45)	4,674 (1.52)	12,310 (3.19)	61,219 (2.59)	45.0 (33.1)	8 (21.2)	46.4 (32.6)	9 (20.1)
Catanduanes	1,140 (3.02)	539 (1.59)	113 (1.42)	31,800 (3.18)	11,304 (1.66)	6,272 (2.15)	13,044 (3.04)	66,474 (2.47)	49.5 (23.4)	4.9 (22.2)	54.8 (16.9)	9.2 (19.0)
Masbate	3,321 (4.24)	1,199 (1.34)	471 (1.52)	81,385 (3.18)	50,334 (1.66)	4,760 (1.82)	27,941 (2.65)	170,351 (2.34)	50.8 (31.7)	1.9 (15.5)	51.3 (29.5)	2.8 (16.4)
Panay	42,247 (3.01)	34,704 (1.34)	3,255 (1.32)	1,487,261 (2.43)	919,098 (1.48)	204,069 (1.58)	499,254 (2.65)	3,109,780 (1.87)	46.0 (37.8)	3.5 (12.7)	47.8 (29.6)	6.6 (16.1)
Guimaras	1,586 (2.71)	1,191 (1.36)	300 (1.44)	32,796 (3.18)	23,198 (1.38)	8,854 (1.58)	8,854 (1.58)	63,236 (1.87)	49.3 (37.0)	0 (13.8)	49.3 (36.7)	0 (14.0)
Negros	49,874 (2.41)	18,128 (1.37)	3,785 (1.36)	1,490,074 (2.82)	468,997 (1.99)	190,865 (1.34)	864,847 (2.65)	2,940,593 (1.82)	52.4 (19.1)	4.0 (24.5)	52.7 (16.5)	6.7 (24.1)
Bohol	7,936 (3.44)	2,228 (1.42)	1,400 (1.88)	325,953 (3.87)	64,344 (2.44)	58,248 (2.45)	93,508 (2.65)	551,556 (2.45)	57.6 (16.2)	10.2 (16.1)	59.0 (11.7)	12.4 (17.0)
Cebu	119,184 (3.44)	37,145 (1.42)	4,045 (1.42)	1,896,628 (3.87)	502,459 (2.44)	155,328 (1.82)	522,811 (2.65)	3,087,227 (1.87)	62.0 (19.3)	2.1 (16.5)	61.4 (16.3)	5.4 (16.9)
Siquijor	1,193 (1.81)	260 (1.43)	1 (1.52)	22,921 (2.92)	4,945 (1.44)	1 (1.34)	10,165 (1.82)	31,573 (1.51)	59.7 (13.0)	0 (27.3)	60.8 (12.3)	0 (26.8)
Samar/Leyte	24,995 (3.63)	9,237 (1.57)	3,698 (1.60)	1,362,717 (3.52)	413,206 (1.81)	264,067 (1.82)	496,945 (2.65)	2,536,430 (1.82)	52.7 (19.5)	7.6 (20.1)	53.7 (16.3)	10.4 (19.6)
Mindanao	136,204 (2.72)	49,704 (1.59)	1,827 (1.52)	8,463,498 (2.88)	2,607,689 (1.99)	1,298,301 (1.61)	3,155,335 (2.65)	15,526,458 (1.87)	55.4 (20.2)	5.6 (18.7)	54.5 (16.8)	8.4 (20.3)
Camiguin	1,990 (3.45)	1,385 (1.20)	1 (1.17)	36,858 (3.26)	29,191 (1.23)	1 (1.18)	6,160 (1.82)	72,459 (1.66)	50.8 (40.7)	0 (8.5)	51.1 (40.5)	0 (8.3)
Total	402,662 (2.42)	163,187 (1.46)	31,653 (1.53)	16,200,592 (2.73)	5,449,274 (1.59)	2,350,278 (1.59)	5,733,033 (2.65)	29,753,176 (1.66)	55.3 (22.4)	4.3 (17.9)	54.5 (18.3)	7.9 (19.3)

() : Growth Rate against 1997 W/O Value

Table 9.2-3 Number of Vehicle Trips and Vehicle Type Distribution (4/4)

Island	Total Number of Trips						Total Vehicle-km			Number of Trip Share (%)		Vehicle-km Share (%)							
	Car		Bus		Truck		Total		Car	Bus	Truck	Car	Bus	Truck					
	Jeepney	Other	Jeepney	Other	Jeepney	Other	Jeepney	Other	Jeepney	Other	Jeepney	Jeepney	Other	Truck					
Mariindque	1,612	(1,001)	3	(1,857)	485	(2,139)	40,992	(27,052)	851	(1,095)	79,090	51.3	34.7	1.0	12.9	50.7	34.2	1.1	14.0
Mindoro	1,046	(5,337)	1,539	(2,556)	2,556	(12,739)	47,519	(15,008)	50,981	(9,481)	85,232	56.3	27.5	5.2	11.0	56.3	25.7	6.0	11.9
Palawan	1,145	(1,592)	1,512	(2,385)	2,610	(1,725)	25,740	(68,032)	1,342	(102,866)	475,574	50.1	17.3	7.3	25.3	54.2	14.3	9.9	21.6
Romblon	1,119	(2,100)	2,318	(2,555)	3,234	(2,511)	23,488	(17,864)	(2,459)	(12,370)	58,501	44.5	31.1	4.6	23.7	45.4	31.3	8	22.5
Catanduanes	1,527	(1,535)	1,683	(2,207)	2,463	(2,463)	51,319	(14,487)	(7,940)	(92,788)	72,308	49.0	21.7	4.6	24.7	55.3	15.6	8.6	20.5
Mesbate	1,111	(1,992)	1,700	(2,905)	1,102	(2,905)	13,732	(4,453)	(1,942)	(7,303)	73,250	51.4	30.1	1.7	16.8	51.8	28.2	2.6	17.5
Panay	1,841	(2,133)	2,295	(2,436)	2,717	(2,327)	1,034,660	(1,034,660)	202,474	(3,405)	3,596,762	46.1	35.9	3.1	14.9	45.6	28.9	5.6	19.9
Guimaras	1,885	(1,245)	1,811	(2,611)	3,836	(3,836)	38,400	(26,026)	(1,568)	(12,414)	74,155	49.0	35.1	0	15.9	48.8	34.9	0	16.3
Negros	3,291	(1,539)	4,550	(2,549)	3,836	(0,000)	1,937,170	(584,170)	228,409	(1,072,144)	3,792,506	51.5	17.9	3.5	27.1	51.2	15.7	5.9	27.2
Bohol	1,268	(1,777)	1,551	(2,308)	2,519	(1,772)	386,574	(70,544)	76,717	(129,604)	666,400	56.7	15.1	9.4	18.7	58.0	11.0	11.5	19.4
Cebu	1,153	(1,630)	1,815	(2,681)	2,705	(1,645)	2,419,411	(633,612)	201,869	(923,573)	4,177,151	58.3	18.2	1.9	21.7	57.9	15.2	4.8	22.1
Siquijor	1,505	(1,735)	1,750	(2,742)	2,742	(2,742)	28,888	(5,980)	(1,942)	(3,204)	51,457	54.9	12.2	0	32.9	56.1	11.6	0	32.3
Samar/Leyte	2,282	(1,188)	4,306	(2,309)	2,309	(0,000)	1,722,673	(485,429)	319,033	(752,742)	3,293,872	52.3	17.9	7.1	22.6	52.3	14.7	9.7	23.2
Mindanao	1,324	(1,891)	1,558	(2,871)	3,128	(1,058)	10,598,167	(3,016,322)	1,550,970	(4,932,448)	20,087,948	55.4	18.7	5.2	20.8	52.7	15.0	7.7	24.6
Camiguin	1,186	(1,567)	1,876	(2,388)	2,388	(2,388)	40,573	(28,908)	(1,200)	(6,848)	76,469	52.9	37.7	0	9.4	53.1	37.8	0	9.1
Total	516,139	(1,744)	36,946	(2,867)	2,867	(2,550)	19,779,054	(6,315,556)	2,668,288	(8,818,313)	37,661,212	54.2	20.8	3.9	21.1	52.6	16.8	7.1	23.5
Mariindque	2,287	(1,223)	2,284	(2,284)	4,337	(4,337)	62,892	(40,914)	1,341	(15,439)	121,196	52.7	34.2	1.0	12.1	52.7	33.8	1.1	12.4
Mindoro	1,436	(6,317)	6,317	(2,556)	2,556	(12,739)	70,519	(15,008)	83,232	(9,481)	85,232	57.1	25.2	5.5	12.2	58.0	22.9	6.6	12.5
Palawan	1,145	(1,592)	1,512	(2,385)	2,610	(1,725)	25,740	(68,032)	1,342	(102,866)	475,574	58.6	16.0	9.1	16.3	62.5	13.4	11.2	13.0
Romblon	1,119	(2,100)	2,318	(2,555)	3,234	(2,511)	23,488	(17,864)	(2,459)	(12,370)	58,501	47.4	30.3	7	21.6	48.6	30.2	8	20.4
Catanduanes	1,527	(1,535)	1,683	(2,207)	2,463	(2,463)	51,319	(14,487)	(7,940)	(92,788)	72,308	50.0	21.7	4.5	23.8	56.0	15.6	8.3	20.2
Mesbate	1,111	(1,992)	1,700	(2,905)	1,102	(2,905)	13,732	(4,453)	(1,942)	(7,303)	73,250	52.2	29.2	1.9	16.7	52.8	27.0	2.9	17.3
Panay	1,841	(2,133)	2,295	(2,436)	2,717	(2,327)	1,034,660	(1,034,660)	202,474	(3,405)	3,596,762	47.1	35.0	3.2	14.6	47.6	27.7	5.9	18.7
Guimaras	1,885	(1,245)	1,811	(2,611)	3,836	(3,836)	38,400	(26,026)	(1,568)	(12,414)	74,155	50.4	34.1	0	15.5	50.3	33.9	0	15.7
Negros	3,291	(1,539)	4,550	(2,549)	3,836	(0,000)	1,937,170	(584,170)	228,409	(1,072,144)	3,792,506	52.7	18.0	3.6	25.7	52.9	15.9	6.0	25.2
Bohol	1,268	(1,777)	1,551	(2,308)	2,519	(1,772)	386,574	(70,544)	76,717	(129,604)	666,400	57.8	14.7	9.2	18.3	59.3	10.6	11.2	19.0
Cebu	1,153	(1,630)	1,815	(2,681)	2,705	(1,645)	2,419,411	(633,612)	201,869	(923,573)	4,177,151	59.0	18.1	1.9	20.9	58.8	15.1	4.9	21.3
Siquijor	1,505	(1,735)	1,750	(2,742)	2,742	(2,742)	28,888	(5,980)	(1,942)	(3,204)	51,457	56.6	12.3	0	31.1	57.7	11.7	0	30.6
Samar/Leyte	2,282	(1,188)	4,306	(2,309)	2,309	(0,000)	1,722,673	(485,429)	319,033	(752,742)	3,293,872	53.7	18.0	7.1	21.2	54.4	15.1	9.6	20.9
Mindanao	1,324	(1,891)	1,558	(2,871)	3,128	(1,058)	10,598,167	(3,016,322)	1,550,970	(4,932,448)	20,087,948	56.7	18.7	5.3	19.3	55.0	15.4	7.9	21.8
Camiguin	1,186	(1,567)	1,876	(2,388)	2,388	(2,388)	40,573	(28,908)	(1,200)	(6,848)	76,469	53.9	36.9	0	9.1	54.1	36.9	0	8.9
Total	630,997	(2,114)	45,491	(2,258)	2,258	(3,054)	26,334,450	(8,096,871)	3,551,018	(10,135,472)	48,117,908	54.7	20.7	4.1	19.9	54.7	16.3	7.4	21.1

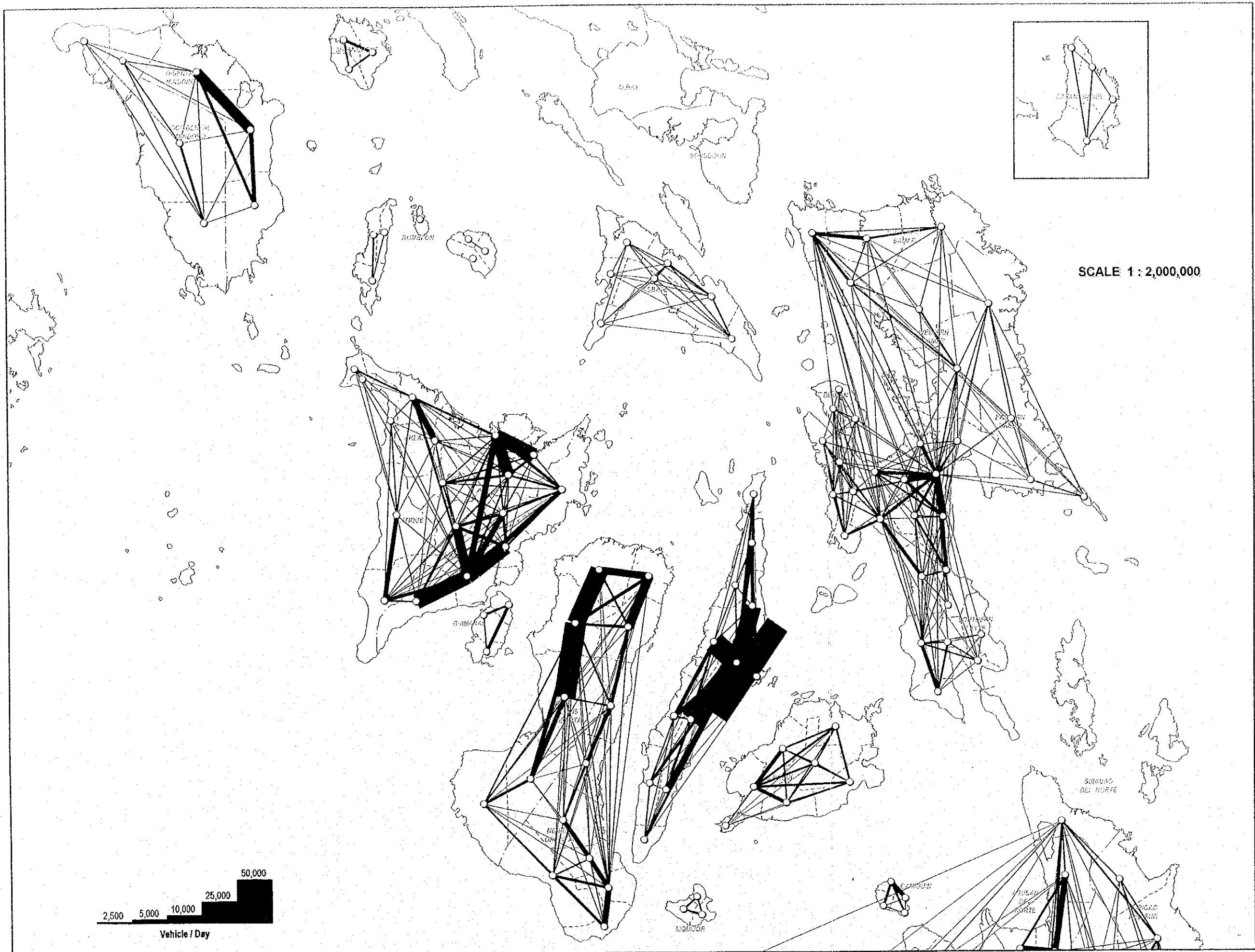


FIGURE 9.2 - 1 (1) DESIRE LINE (With Project) IN 2016

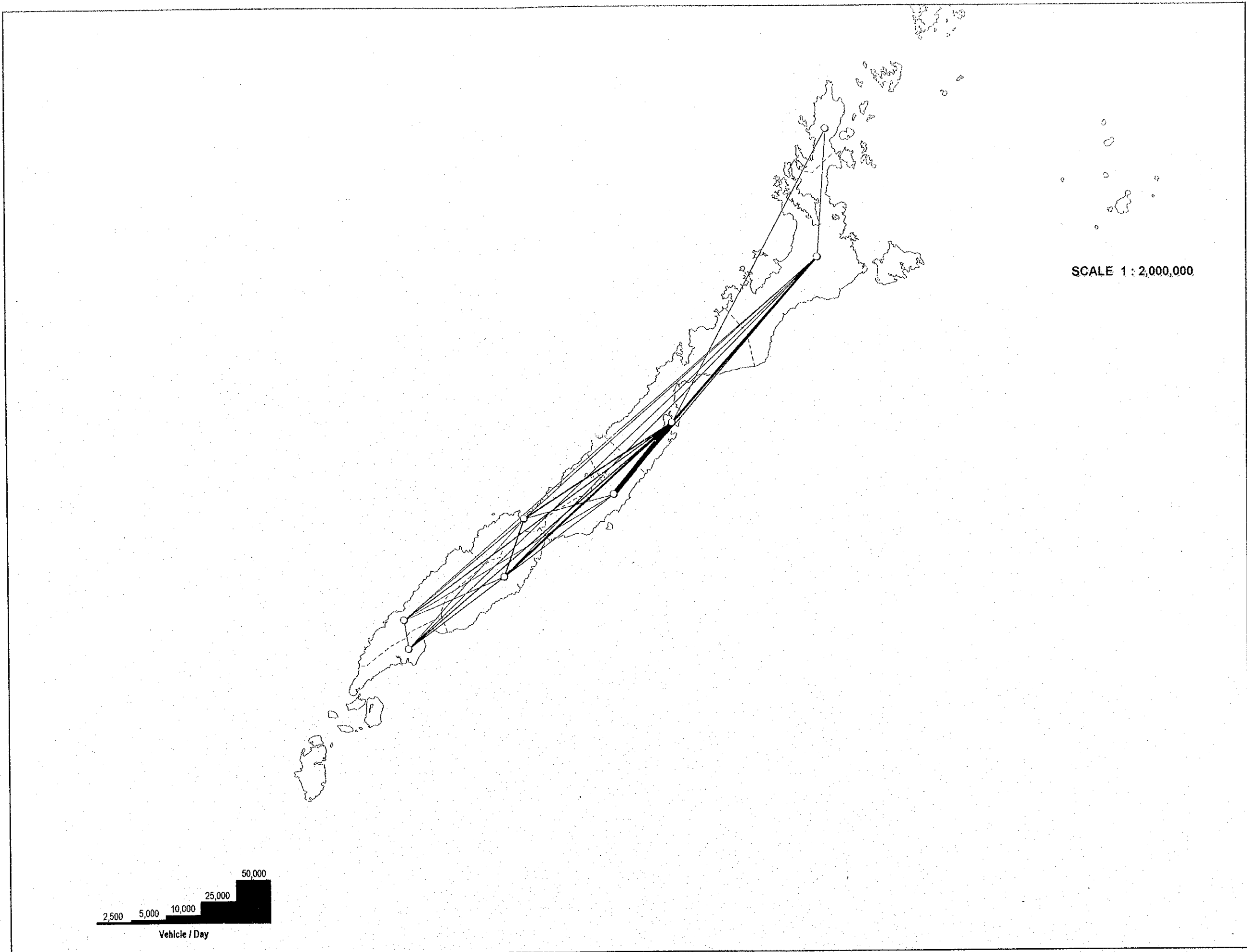


FIGURE 9.2 - 1 (3) DESIRE LINE (With Project) IN 2016

