

MOTOR VEHICLES REGISTRATION FORECAST (2001 – 2005)

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1. INTRODUCTION

The Land Transportation Office (LTO), being the primary agency responsible for the nationwide registration and regulation of all types of road transport motor vehicles, is a major source of transport data. These data could provide useful information relevant to transport planning and programming when further analysis and statistical treatment are applied.

In this report, the annual motor vehicle registration records of LTO was statistically treated using regression based and time-series forecasting techniques to come up with simple but reliable estimates that would give transport planners an overview of the motor vehicle fleet in the next five years. This information may serve as a vital input in designing appropriate policies, programs and infrastructure development, as government needs to consider future trends in motor vehicle registration to effectively address the problems of traffic congestion and environmental degradation.

2. GENERAL METHODOLOGICAL FRAMEWORK

The Gross Regional Domestic Product or GRDP was used as predictor of motor vehicle registration in each region. The rationale for considering such factor is that growth in motor vehicle fleet is generally induced by growth in productivity, income and population, which are reflected in the GRDP. Furthermore, correlation and regression analysis indicated significant relationship and predictability and comparison between actual and projected values showed minimal percentage errors.

The methodological framework used in forecasting could be summarized in the following procedures:

- Use GRDP as a predictor of motor vehicle registration volume
- Use NEDA GDP rates projections for 2001 to 2005
- Forecast GRDP share of each region to National GDP using time-series regression or naïve forecasting techniques.
- Use forecasted GRDP shares to compute GRDP in each region

- Apply regression analysis between GRDP and total motor vehicle registration volume by type of vehicle. (Car, PUV, Bus, MC/TC, Trucks and Trailers)
- Use regression models (equations) to forecast volume of motor vehicle registration

3. PROJECTED NATIONAL GDP

Table 3-1 shows the projected GDP rates for the period 2001 to 2005 released by NEDA. It is important to take note that NEDA adjusts its projections as economic and political condition changes. Therefore, vehicle registration forecast should be adjusted as well.

Table 3-1 Projected GDP Rates

<i>Growth</i>	<i>Rate</i>
2001	4.0%
2002	5.4%
2003	5.7%
2004	6.1%
2005	6.4%

Source: NEDA

4. RELATIONSHIP BETWEEN MOTOR VEHICLE REGISTRATION AND GROSS REGIONAL DOMESTIC PRODUCT (GRDP)

The regression analysis between motor vehicle registration and GRDP has been carried out for the whole nation and for each region and vehicle type. The results, generally, indicated positive correlation between the two variables. In statistical terms, the relationship may be described as follows:

$$\mathbf{MVR}_{vrt} = \mathbf{A}_{vr} + \mathbf{B}_{vr} (\mathbf{GRDP}_{rt})$$

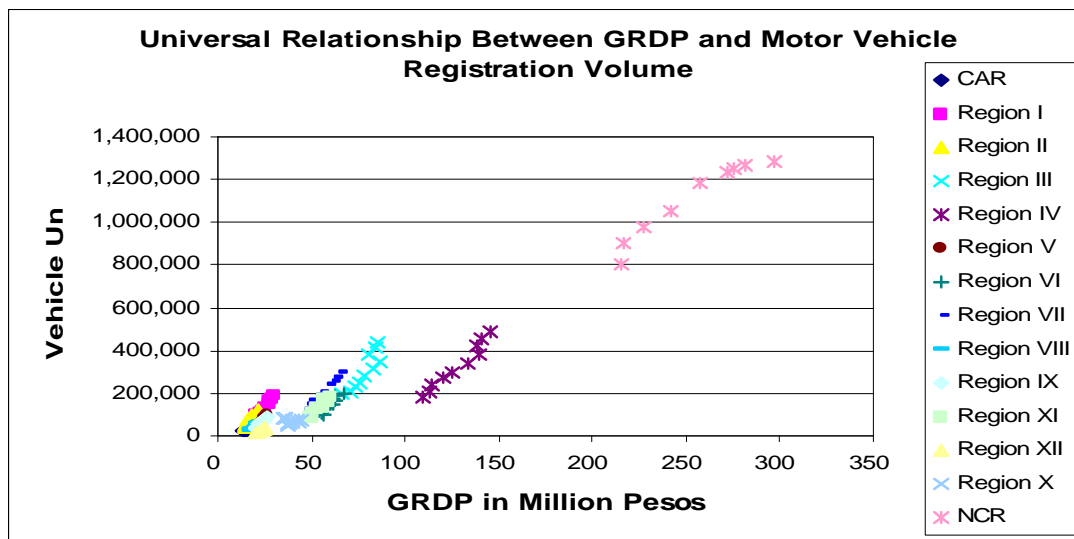
Where: \mathbf{MVR}_{vrt} is the registration volume of vehicle \mathbf{v} for region \mathbf{r} in the year \mathbf{t}

\mathbf{GRDP}_{rt} is the projected GRDP for region \mathbf{r} in the year \mathbf{t}

\mathbf{A} and \mathbf{B} are the constants

Figure 4-1 shows the scatter plot illustrating the universal relationship between each region's GRDP and motor vehicle registration volume.

Figure 4-1



5. MOTOR VEHICLE REGISTRATION FORECASTS

The focus of analyses will be on the nationwide forecast and highly urbanized regions in Luzon, which includes the NCR, Region III and IV. The forecasts were made under the assumptions that the government’s projected GDP rates will be met and that all other factors affecting the growth of motor vehicles remain constant.

5.1. All Types of Vehicle Forecast

All Types Vehicles comprises both private and for-hire Cars, Buses, Public Utility Vehicles (PUV), Motorcycles and Tricycles (MC/TC), Trucks and Trailers.

All Types Motor Vehicles Registration Forecast: Philippines and NCR

Philippine Forecast

From 1991 to 2000, the Philippines’ total motor vehicle registration volume had been increasing at an average rate of 8.75%. Its last 5 years average growth rate, however, decreased to 7.52% vis-à-vis the 1991 to 1995 annual average growth rate of 11%. This happened as prices of motor vehicles and interest rates went up due to the 1997 Asian financial crisis.

Figure 4-1 shows the trend and 5-year projection on the Philippines’ total motor vehicle registration. Using the NEDA projected GDP growth rates, the total volume of motor vehicles is expected to grow at an annual average rate of 9.11% from 2001 to 2005. This translates to a volume of 5,822,204 motor vehicles by 2005, a 57% increase from year 2000’s 3,773,517.

Regression Equation: $MVR_{All\ Types\ Phil} = -3811417 + 0.0079(GRDP_{Phil\ t})$

Figure 4-1

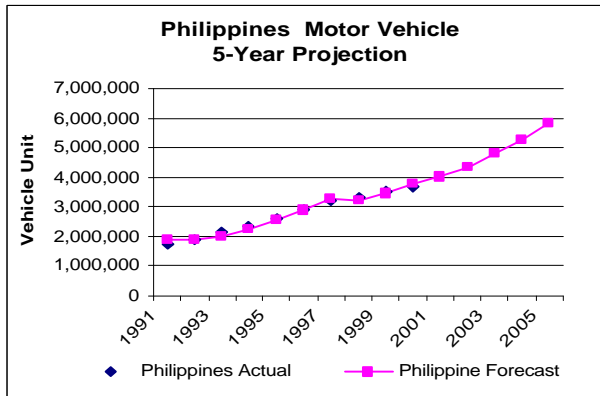


Table 4-1

Projected Total Motor Vehicles	Philippines	
	Volume	Ave. Annual Growth Rate
2001	4,025,139	9.11%
2002	4,338,601	
2003	4,778,702	
2004	5,268,338	
2005	5,822,204	

National Capital Region (NCR) Forecast

For the past 5 years (1996-2000), NCR’s volume of vehicle registration had been growing at decreasing rates, as illustrated in figure 4-2. It even registered a negative growth of 1.5% in 1998, the same year when the country posted a negative GDP. However, taking into consideration the country’s anticipated recovery in the medium-term period, NCR’s motor vehicles is projected to grow annually at an average rate of 7.23% in the next 5 years.

Figure 4-2

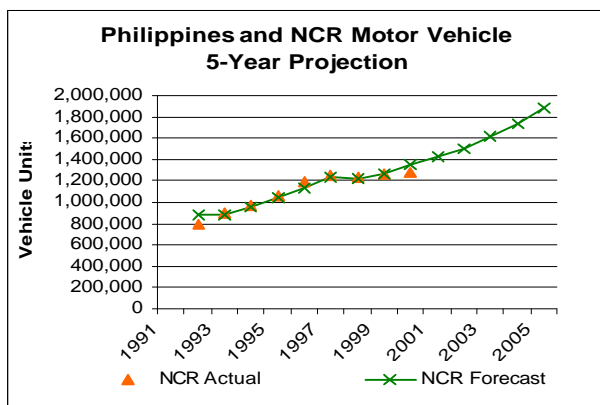


Table 4-2

Projected Total Motor Vehicles	NCR	
	Volume	Ave. Annual Growth Rate
2001	1,420,075	7.23%
2002	1,501,452	
2003	1,612,862	
2004	1,736,827	
2005	1,876,954	

All Types Motor Vehicle Registration Forecast: Region III, IV & VII

Region III (Central Luzon) Forecast

Central Luzon’s motor vehicle volume is projected to grow annually at an average of 9.10% as compared with its 9.56% average growth from 1996 to 2000. This means that there would be about 586,531 motor vehicles in 2005, which translates to a 34% growth from its year 2000 motor vehicle volume of 432,657.

In the case of Central Luzon, however, it is important to mention that only 77% predictability of motor vehicle registration is explained by its GRDP. Looking at figure 4-3, the actual volume of vehicle registration shows a steady growth despite the significant decline in GRDP in 1998 as reflected in the forecasted volume in the same year. This discrepancy may be attributed to the phenomenal growth of motorcycle and tricycle registration volume as well as the significant growth of cars from 1996 to 2000 despite the financial crisis. (Details regarding Car and MC/TC registration forecasts are presented on section 4.2 and 4.4 of this report.)

Figure 4-3

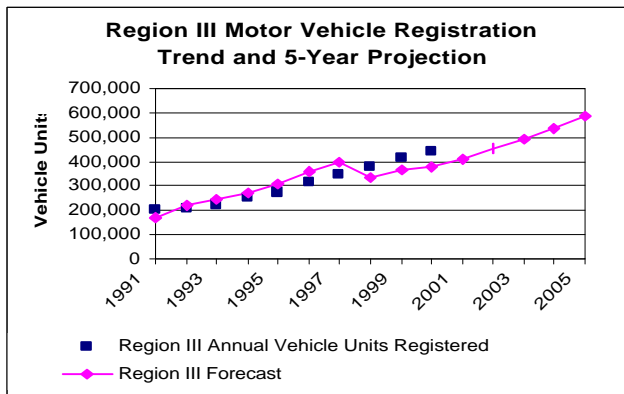


Table 4-3

Projected Total Motor Vehicles	Region III	
	Volume	A ve. Annual Growth Rate
2001	411,452	9.10%
2002	453,185	
2003	492,711	
2004	536,663	
2005	586,531	

Region IV (Southern Tagalog) Forecast

The Southern Tagalog Region registered phenomenal growth rates in the past 10 years with an average rate of 11%. It is estimated that it would continue to grow at an average rate of 6.5% from 2001 to 2005. At this rate, total volume of motor vehicle would reach 637,199 units by the year 2005, which is equivalent to a 31% volume increase from year 2000 volume of 487,648 vehicles.

Figure 4-4

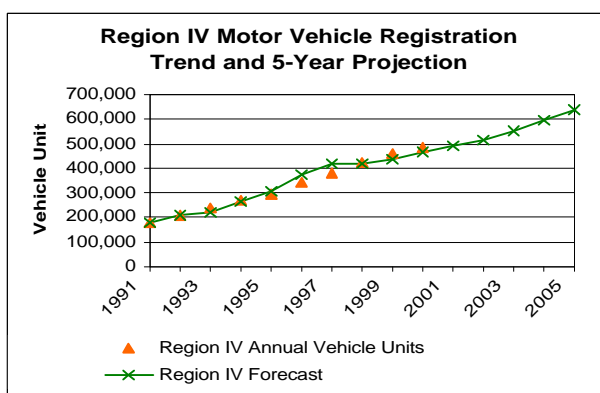


Table 4-4

Projected Total Motor Vehicles	Region IV	
	Volume	A ve. Annual Growth Rate
2001	488,887	6.50%
2002	514,972	
2003	554,613	
2004	595,039	
2005	637,199	

4.1.4. Summary of Correlation and Regression Analysis Between All Types Motor Vehicle Registration and GRDP

All Class / All Types	Philippines	NCR	CAR	Region I	Region II	Region III	Region IV	Region V	Region VI	Region VII	Region VIII	Region IX	Region X	Region XI	Region XII
Correlation	99.27%	96.58%	98.78%	98.13%	97.44%	87.91%	98.05%	98.52%	94.39%	99.21%	99.34%	95.82%	94.13%	95.72%	97.85%
R Square	98.54%	93.28%	97.57%	96.29%	94.95%	77.28%	96.14%	97.07%	89.10%	98.43%	98.68%	91.82%	88.60%	91.62%	95.74%
Intercept	-3811417	-374242	-17208.5	-142805	-84355.7	-563191	-708810	-227464	-316323	-299294	-103991	-108626	49523.1	-325621	-74770.4
Slope	0.007936	0.005837	0.00287	0.011	0.00961	0.01109	0.0081	0.01225	0.00772	0.00918	0.00768	0.00743	3300.25	0.00842	0.00435
Mean Absolute % Error (MAPE)	2.85%	3.33%	3.63%	5.77%	6.24%	11.26%	4.72%	3.36%	8.70%	4.26%	3.08%	7.89%	4.06%	6.36%	6.24%
Projected Volume of Motor Vehicles															
2000(actual)	3,701,173	1,286,176	47,213	194,635	124,049	438,742	487,648	96,001	200,019	297,646	69,515	89,842	83,902	182,870	37,342
2001	4,025,139	1,420,075	51,370	212,462	133,610	411,452	488,887	103,381	194,609	320,668	76,875	98,316	85,826	189,553	40,857
2002	4,338,601	1,501,452	55,727	231,640	147,226	453,185	514,972	112,235	206,341	345,401	84,245	106,123	89,126	202,185	45,482
2003	4,778,702	1,612,862	61,367	257,095	164,894	492,711	554,613	125,962	225,389	379,188	94,797	118,239	92,426	222,281	51,976
2004	5,268,338	1,736,827	67,644	285,423	184,558	536,663	595,039	141,228	246,567	418,609	105,805	130,979	95,727	244,627	59,201
2005	5,822,204	1,876,954	74,727	317,416	206,752	586,531	637,199	158,541	270,613	462,256	118,686	145,536	99,027	269,985	67,373
Motor Vehicle Registration Average Growth Rates															
1991-2000	8.75%	6.23%	9.56%	10.21%	14.31%	9.10%	11.18%	10.31%	8.22%	10.51%	11.18%	11.53%	5.25%	9.70%	14.11%
2001-2005	9.11%	7.23%	9.62%	10.28%	11.54%	9.10%	6.50%	10.57%	6.34%	9.23%	11.30%	10.14%	3.37%	8.14%	12.54%
1996-2000	7.52%	4.14%	8.88%	10.29%	14.24%	9.56%	10.51%	11.20%	9.47%	10.00%	11.91%	10.33%	4.33%	9.68%	13.77%

4.1.5. All Types Motor Vehicle Registration Data (1981-2000)

YEAR	Class	TYPE	PHILS	NCR	CAR	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
1981	All Classes	All Types	1,006,030	445,064	0	52,957	22,410	127,623	87,993	21,194	55,526	55,192	15,788	19,740	34,808	49,865	17,870
1982			1,087,180	470,800	0	58,822	26,828	138,092	98,128	25,892	58,614	60,407	17,454	22,969	36,275	54,627	18,272
1983			1,200,803	510,504	0	67,800	27,784	158,895	112,339	28,651	63,017	68,726	20,283	25,152	40,830	56,979	19,843
1984			1,165,557	477,561	0	68,090	28,004	163,956	111,114	27,253	60,582	65,140	20,406	25,765	38,701	57,797	21,188
1985			1,120,172	463,813	0	64,665	27,552	158,371	109,717	26,219	55,461	60,908	18,699	24,302	36,929	53,328	20,208
1986			1,185,832	479,850	0	71,143	29,222	171,030	119,266	27,922	61,086	64,129	18,682	26,919	38,294	58,314	19,975
1987			1,176,753	490,428	0	67,219	27,339	161,618	120,019	27,223	61,230	56,794	20,209	26,328	39,665	59,146	19,535
1988			1,270,483	517,984	0	73,518	30,408	172,020	130,250	28,761	59,054	78,189	21,437	27,997	43,563	63,357	23,945
1989			1,431,464	588,238	15,741	66,278	34,427	187,223	150,742	31,365	71,695	89,546	22,967	30,149	45,717	70,173	27,203
1990			1,620,242	684,778	18,659	74,079	38,668	197,970	167,492	34,901	77,424	107,192	24,650	34,392	49,232	81,247	29,558
1991			1,715,366	721,776	20,829	79,577	42,482	200,827	178,648	38,366	87,294	115,651	26,364	35,921	52,969	83,283	31,379
1992			1,879,563	799,754	21,971	86,644	44,493	208,985	206,619	43,147	97,176	126,793	29,313	39,891	54,062	89,245	31,470
1993			2,125,115	901,312	24,682	96,890	51,472	230,168	241,608	47,992	108,020	148,925	32,992	44,083	58,421	104,908	33,642
1994			2,341,469	973,550	27,257	107,280	62,297	251,139	270,313	53,433	121,859	165,944	36,762	50,450	64,545	120,469	36,171
1995			2,581,354	1,055,692	30,893	119,352	73,051	278,229	296,512	60,568	132,756	189,635	41,744	56,611	74,249	132,057	40,005
1996			2,904,487	1,188,724	34,542	132,546	84,627	312,664	343,482	69,880	148,025	210,912	48,500	61,096	63,506	134,896	45,402
1997			3,193,549	1,253,669	38,443	150,007	102,207	347,602	383,178	81,009	164,445	236,357	55,720	68,947	71,403	158,208	52,953
1998			3,316,817	1,234,372	41,920	163,158	104,689	377,058	422,743	86,921	173,430	257,667	59,220	74,200	74,482	156,563	56,382
1999			3,533,732	1,271,227	45,004	177,129	112,660	415,090	458,621	92,315	190,461	277,509	65,305	83,783	79,206	170,132	61,466
2000			3,701,173	1,286,176	47,213	194,635	124,049	438,742	487,648	96,001	200,019	297,646	69,515	89,842	83,902	182,870	66,586

Source: Land Transportation Office

4.2. Car Vehicle Registration Forecast

Car Registration Forecast: Philippines and NCR

The car volume registration of NCR and the whole country in general had been growing steadily from 1991 to 1996. The decreasing growth trends from 1997 to 2000, as could be seen in Figures 4-16 and 4-17, manifest the adverse effect of the Asian crisis in the car industry.

Looking at the NCR graph in Figure 4-17, it shows that there is a downward trend in car registration volume that started in 1997. The Car registration volume had decreased by 2.18% in 1998 and 3.15% in 2000. Despite this negative trend, however, it is predicted that car registration volume will grow in the succeeding years under the assumption that consumer purchasing power and interest rates will improve as the economy recovers.

Therefore, utilizing the government's projected GDP growth rates from the year 2001 to 2005 as predictor, it is estimated that the volume of cars in the Philippines and NCR will increase annually at an average rate of 7.46% and 6.67% respectively from 2001 to 2005. Table 4-16 and 4-17 show the projected volume of car registration for the Philippines and NCR.

Figure 4-16

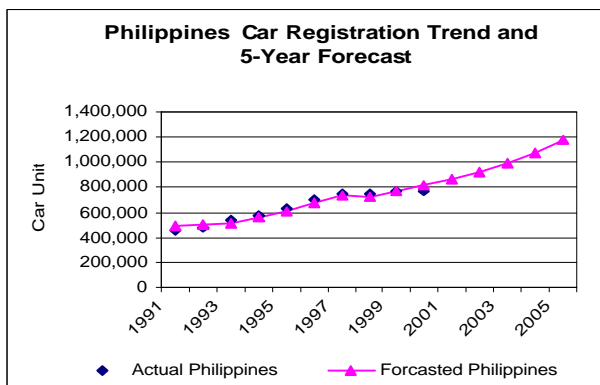


Table 4-16

Projected Car Volume	Philippines	
	Volume	A ve. Annual Growth Rate
2001	863,631	7.46%
2002	917,674	
2003	993,550	
2004	1,077,967	
2005	1,173,457	

Figure 4-17

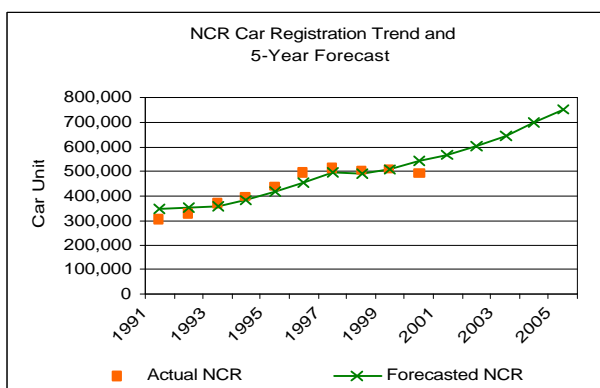


Table 4-17

Projected Car Volume	NCR	
	Volume	A ve. Annual Growth Rate
2001	545,115	6.67%
2002	569,749	
2003	602,324	
2004	646,921	
2005	696,544	

Car Registration Forecast: Region III, IV and VII

Region III (Central Luzon) Forecast

Region III's car registration volume is expected to reach 67,594 units in 2005, growing at the rate of 4.22% annually. As of the year 2000, there were already about 58,400 cars registered in Region III. In this case, however, the Time-Series Linear Trend Regression Analysis method was used since the regression analysis between GRDP and car registration did not show satisfactory correlation and predictability.

Figure 4-18

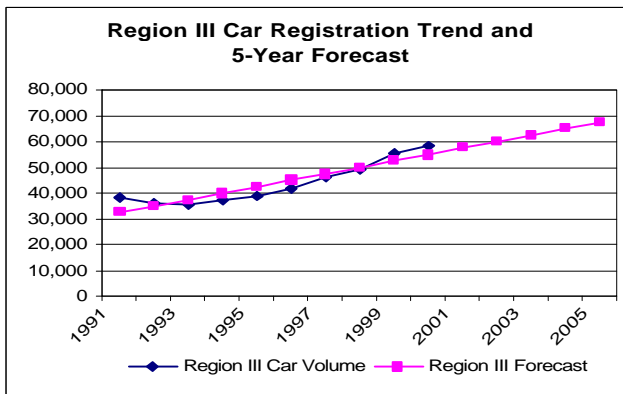


Table 4-18

Projected Car Volume	Region III	
	Volume	A ve. A n n u a l Growth Rate
2001	57,507	4.22%
2002	60,029	
2003	62,551	
2004	65,073	
2005	67,594	

Region IV (Southern Tagalog) Forecast

Region IV's vehicle units are estimated to grow at an average rate of 8.71% annually. Basing from the region's projected economic performance, it is estimated that about 84,716 cars will be registered in 2005 as compared with its 67,143 cars in 2000.

The high growth rate of car registration volume is indicative of rapid urbanization in this region.

Figure 4-19

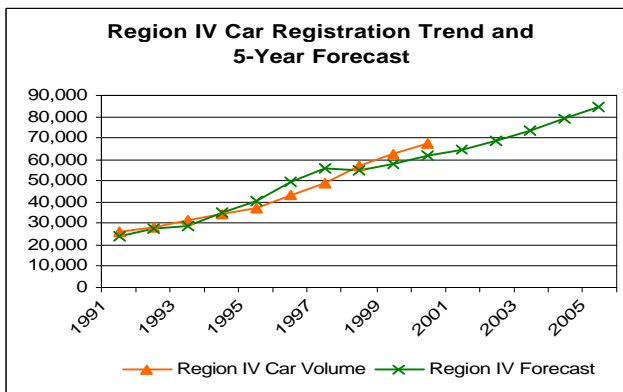


Table 4-19

Projected Car Volume	Region IV	
	Volume	A ve. A n n u a l Growth Rate
2001	64,916	8.71%
2002	68,398	
2003	73,691	
2004	79,088	
2005	84,716	

4.2.1 Summary of Correlation and Regression Analysis Between Car Registration Volume and GRDP

All Class / Cars	Philippines	NCR	CAR	Region I	Region II	Region III	Region IV	Region V	Region VI	Region VII	Region VIII	Region IX	Region X	Region XI	Region XII
Correlation	97.65%	92.19%	98.38%	98.72%	96.49%	92.47%	95.52%	96.82%	94.14%	93.82%	97.27%	98.71%	97.07%	92.05%	93.41%
R Square	95.36%	84.99%	96.79%	97.45%	93.10%	85.51%	91.25%	93.74%	88.63%	88.03%	94.61%	97.43%	94.23%	84.74%	87.25%
Intercept	-487445	-148512	-2883.36	-12626.3	-3318.04	29765.1	-94983	-15032.3	-26695.3	-13859.9	-3969.33	-4827.53	5803.07	-26510.4	-3830.69
Slope	0.001368	0.002337	0.0006	0.00102	0.00046	2521.96	0.00108	0.00085	0.00079	0.00084	0.00032	0.00034	342.552	0.0008	0.00035
Mean Absolute % Error (MAPE)	3.45%	5.91%	4.37%	4.28%	4.95%	5.52%	7.68%	4.34%	5.41%	5.96%	4.90%	3.00%	2.67%	6.86%	5.20%
Projected Volume of Motor Vehicles															
2000(actual)	767,948	491,128	10,230	18,955	6,621	58,401	67,143	7,668	25,336	37,278	3,457	4,291	9,088	20,809	5,567
2001	863,631	569,749	11,380	20,390	7,138	57,507	64,916	8,022	25,630	42,871	3,569	4,577	9,571	22,466	5,537
2002	917,674	602,324	12,286	22,173	7,791	60,029	68,398	8,639	26,832	45,134	3,876	4,931	9,914	23,667	5,912
2003	993,550	646,921	13,459	24,538	8,639	62,551	73,691	9,596	28,783	48,226	4,316	5,482	10,256	25,577	6,438
2004	1,077,967	696,544	14,765	27,171	9,582	65,073	79,088	10,659	30,951	51,833	4,775	6,061	10,599	27,701	7,023
2005	1,173,457	752,637	16,238	30,144	10,647	67,594	84,716	11,866	33,414	55,827	5,312	6,722	10,941	30,112	7,685
Motor Vehicle Registration Average Growth Rates															
1991-2000	6.04%	6.72%	8.20%	9.03%	12.11%	4.97%	10.98%	8.56%	5.94%	5.77%	8.40%	10.01%	4.30%	7.43%	6.87%
2001-2005	7.46%	6.67%	9.69%	9.73%	10.51%	4.22%	7.25%	9.16%	5.72%	6.51%	9.01%	11.88%	3.78%	7.68%	6.73%
1996-2000	4.25%	4.59%	7.42%	10.07%	17.26%	8.39%	12.58%	10.55%	7.37%	3.28%	12.70%	12.16%	4.74%	5.60%	7.78%

4.2.2 Car Vehicle Registration Data (1981-2000)

YEAR	Class	TYPE	PHILS	NCR	CAR	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
1981	All Classes	Cars	318,085	205,691		9,909	2,497	33,458	19,570	3,192	11,371	13,615	1,264	1,816	4,232	9,026	2,444
1982			342,878	224,036		10,196	2,478	34,340	22,234	3,322	11,664	14,420	1,309	1,969	4,698	9,572	2,640
1983			367,002	237,366		11,184	2,741	38,553	23,964	3,408	12,570	16,542	1,588	2,112	4,771	9,468	2,735
1984			360,723	227,328		11,407	2,677	42,140	24,538	3,402	12,340	16,037	1,654	2,308	4,669	9,356	2,867
1985			347,949	222,105		11,213	2,716	40,194	22,315	3,222	11,381	15,194	1,610	2,141	4,661	8,512	2,685
1986			356,688	228,844		11,500	2,756	40,847	22,929	3,278	11,512	14,875	1,686	2,228	4,725	8,819	2,689
1987			358,765	231,139		12,033	2,968	41,107	22,764	3,261	11,829	13,657	1,685	2,191	4,721	8,662	2,748
1988			376,646	241,021		12,309	3,059	41,214	24,365	3,283	11,752	17,647	1,668	2,139	5,413	9,701	3,075
1989			412,998	269,233	4,330	8,460	3,185	42,311	26,941	3,318	12,925	19,188	1,664	2,210	5,635	10,342	3,256
1990			454,554	306,959	4,869	8,487	3,255	42,139	25,751	3,436	13,370	21,382	1,604	2,414	5,767	11,692	3,429
1991			453,629	306,299	5,066	8,609	3,337	38,066	25,852	3,522	14,313	22,747	1,618	2,275	6,336	12,273	3,316
1992			481,060	330,664	5,325	8,812	3,324	36,129	28,236	3,959	16,072	23,613	1,659	2,163	6,262	11,585	3,257
1993			531,240	370,389	5,607	9,295	3,250	35,272	31,565	4,095	16,544	26,804	1,777	2,241	6,430	14,448	3,523
1994			572,766	397,014	6,270	10,262	3,531	36,955	34,187	4,499	18,175	28,926	1,895	2,298	7,105	17,957	3,692
1995			626,571	438,117	7,176	11,739	3,936	39,117	37,228	5,039	19,124	31,887	2,050	2,459	8,033	16,811	3,855
1996			702,578	493,496	7,930	13,197	4,315	41,765	43,233	5,520	20,838	35,321	2,162	2,570	7,949	17,364	4,045
1997			743,299	513,255	8,873	14,488	5,064	46,503	48,604	6,278	22,891	37,239	2,481	3,268	8,381	19,797	4,370
1998			749,204	502,059	9,615	15,484	5,581	48,989	56,823	6,744	24,088	38,616	2,668	3,567	8,508	20,056	4,342
1999			773,835	507,109	10,073	17,098	6,435	55,162	62,746	7,520	25,401	38,331	3,283	3,846	8,779	20,771	5,072
2000			767,948	491,128	10,230	18,955	6,621	58,401	67,143	7,668	25,336	37,278	3,457	4,291	9,088	20,809	5,567

Source: Land Transportation Office

4.3 Utility Vehicles (UV) Registration Forecast

Utility Vehicles may be described as small van-type vehicles commonly used for either delivery of commodities or as passenger shuttles that accommodate 10 to 20 passengers. (e.g. jeepney, Tamaraw FX, L300 Van, etc.)

Utility Vehicle Registration Forecast: Philippines and NCR

Philippine Forecast

In 1991 to 1997, the total volume of UV had been growing significantly due to the emergence of new types of UV's such as the Tamaraw FX. The growth had declined in 1998 to 2000, the period of recession. From 2001 to 2005, the total volume of UV is predicted to increase at an average rate of 8.83% from its 5-year previous average growth of 6.84%. A total of 2,118,298 are projected to be registered with LTO in 2005.

Figure 4-31

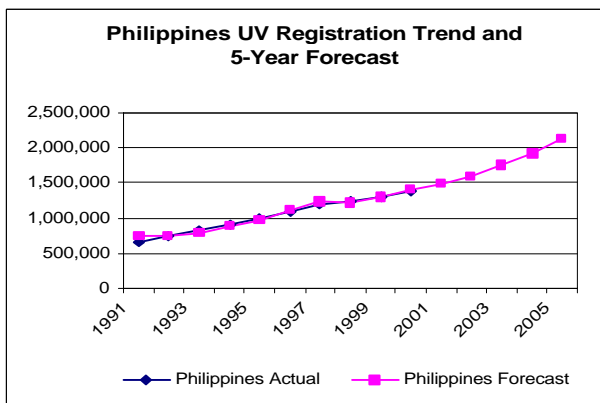


Table 4-31

Projected UV Volume	Philippines	
	Volume	Ave. Annual Growth Rate
2001	1,491,533	8.83%
2002	1,600,859	
2003	1,754,354	
2004	1,925,125	
2005	2,118,298	

NCR Forecast

For NCR, projected average annual growth is estimated to be at 7.54% from its 5-year previous average of 4.90%. A total of about 768,000 UVs are predicted to be registered in 2005.

Certain factors, though, may affect the growth of UV registration volume particularly those for renewal. These are as follows:

- *The imposition of age requirement as provided by the Clean Air Act*
- *The implementation of stricter emission standards (Euro 1) by 2003.*

Figure 4-32

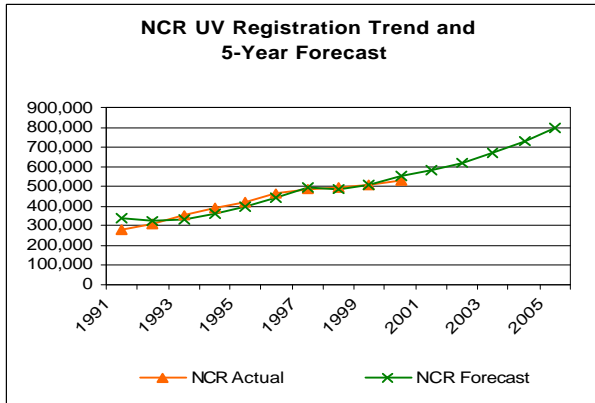


Table 4-32

Projected UV Volume	NCR	
	Volume	Ave. Annual Growth Rate
2001	582,265	8.39%
2002	620,923	
2003	673,848	
2004	732,738	
2005	799,305	

Utility Vehicle Registration Forecast: Region III, IV, and VII

Region III (Central Luzon) Forecast

The Utility Vehicle registration volume of Southern Luzon had been growing steadily from 1991 to 1996 at an average rate of 8.30%. Growth started to decline from 1997 to 2000. With the anticipated economic growth in 2001 to 2005, it is forecasted that volume of UV registration will reach 251,323 units from year 2000's 184,468 units. Projected annual average growth rate is 8.52% as indicated in Table 4-33.

Figure 4-33

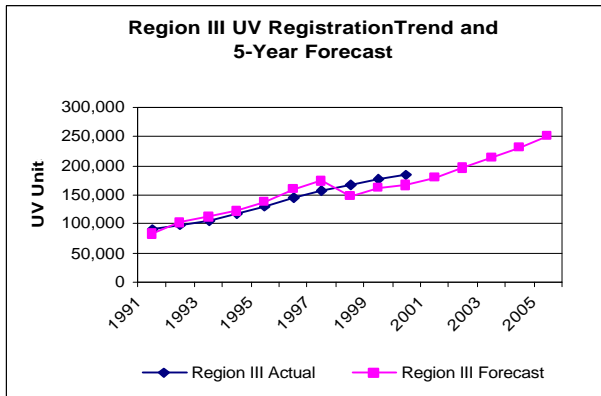


Table 4-33

Projected UV Volume	Region III	
	Volume	Ave. Annual Growth Rate
2001	180,061	8.52%
2002	197,047	
2003	213,136	
2004	231,026	
2005	251,323	

Region IV (Southern Tagalog) Forecast

For the past 10 years Southern Tagalog's volume of UV registration had been growing at decreasing rates. Growth rates fell from a high of 16% in 1992 to as low as 3.90% in 2000. As of the latter year, there are 219,572 utility vehicles registered in this region. It is predicted that UV registration will continue to grow at an average rate of 5.72% from 2001 to 2005. This translates to a volume of 286,220 vehicles by 2005.

Figure 4-34

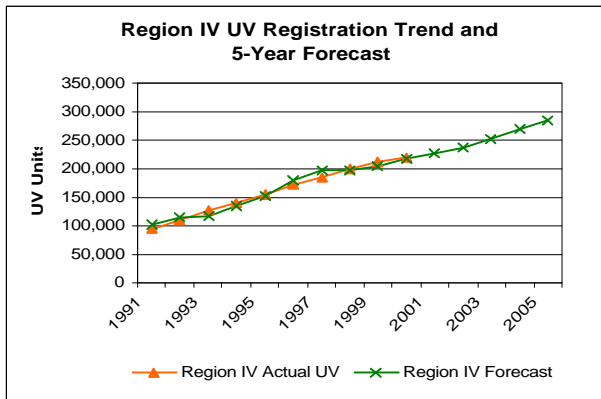


Table 4-34

Projected UV Volume	Region IV	
	Volume	A ve. Annual Growth Rate
2001	226,348	5.72%
2002	236,878	
2003	252,881	
2004	269,201	
2005	286,220	

4.3.1 Summary of Correlation and Regression Analysis Between UV Registration Volume and GRDP

All Class / Utility Vehicle	Philippines	NCR	CAR	Region I	Region II	Region III	Region IV	Region V	Region VI	Region VII	Region VIII	Region IX	Region X	Region XI	Region XII
Correlation	98.98%	94.69%	98.65%	98.41%	93.12%	91.54%	98.73%	97.82%	94.04%	98.30%	99.51%	95.36%	92.44%	93.68%	96.20%
R Square	97.98%	89.65%	97.31%	96.85%	86.71%	83.80%	97.48%	95.68%	88.44%	96.63%	99.02%	90.93%	85.46%	87.76%	92.55%
Intercept	-1241634	-270126.2	-7400.7	-37398.2	-21676	-216650	-257155	-52740.6	-76517.9	-88933.5	-24029	-19975.3	17379.3	-66663.6	-17289.5
Slope	0.002768	0.002773	0.00073	0.0032	0.00265	0.004515	0.003269	0.003012	0.002107	0.002664	0.00191	0.00157	843.188	0.001916	0.001401
Mean Absolute % Error (MAPE)	2.99%	5.62%	6.16%	4.47%	9.42%	8.02%	8.90%	3.44%	6.11%	4.73%	2.68%	6.43%	3.49%	5.68%	4.86%
Projected Volume of Motor Vehicles															
2000(actual)	1,388,117	534,262	9,410	60,089	34,639	184,468	219,572	27,241	64,564	91,399	19,867	22,296	26,970	49,857	19,227
2001	1,491,533	582,265	10,082	65,814	38,561	180,061	226,348	28,622	62,916	91,080	20,950	23,692	26,654	50,612	19,959
2002	1,600,859	620,923	11,193	71,386	42,324	197,047	236,878	30,800	66,118	98,262	22,783	25,339	27,498	53,488	21,449
2003	1,754,354	673,848	12,631	78,781	47,206	213,136	252,881	34,176	71,316	108,072	25,407	27,896	28,341	58,062	23,541
2004	1,925,125	732,738	14,231	87,011	52,641	231,026	269,201	37,930	77,096	119,519	28,145	30,584	29,184	63,149	25,868
2005	2,118,298	799,305	16,037	96,306	58,774	251,323	286,220	42,187	83,658	132,192	31,348	33,656	30,027	68,922	28,501
Motor Vehicle Registration Average Growth Rates															
1991-2000	8.44%	7.66%	15.62%	9.28%	11.06%	8.30%	9.70%	9.27%	7.58%	11.62%	9.51%	8.54%	4.31%	8.41%	6.83%
2001-2005	8.83%	8.39%	11.27%	9.90%	11.16%	8.52%	5.72%	9.17%	5.37%	9.41%	9.57%	8.60%	2.18%	6.73%	8.22%
1996-2000	6.84%	4.90%	14.56%	8.85%	9.90%	7.24%	7.17%	8.48%	6.90%	12.89%	10.88%	7.71%	3.07%	9.10%	8.27%

4.3.2 Utility Vehicle Registration Data (1981-2000)

YEAR	CLASS	TYPE	PHILS	NCR	CAR	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
1980	All Classes	Utility Vehicle	192,298	63,972		11,220	5,863	25,947	26,518	4,211	13,166	10,300	4,956	3,518	6,549	10,537	5,541
1981			364,706	162,693		19,435	7,519	47,054	40,295	7,245	18,866	15,572	5,318	6,181	11,549	16,873	6,106
1982			384,481	163,679		21,265	8,799	49,547	44,688	8,761	19,511	18,115	5,833	6,890	12,144	18,533	6,716
1983			427,925	179,361		24,878	9,306	57,512	51,151	9,722	21,954	20,673	6,591	7,481	13,057	18,962	7,277
1984			416,721	169,232		24,950	9,155	58,921	50,109	9,564	21,098	19,807	6,798	7,523	12,582	19,048	7,934
1985			405,830	165,693		23,956	9,189	59,930	50,886	8,946	19,892	18,305	6,322	6,961	11,554	17,031	7,165
1986			416,554	169,561		24,701	8,493	61,582	53,993	8,905	20,444	18,973	6,076	7,298	11,814	17,644	7,070
1987			441,757	179,465		25,979	9,020	65,207	59,329	9,315	22,439	17,348	6,902	7,643	13,005	18,858	7,247
1988			475,099	189,404		27,922	10,178	69,809	65,987	9,887	20,347	23,500	7,194	8,138	14,387	19,750	8,596
1989			536,405	216,497	8,323	22,597	11,094	76,612	74,476	10,327	26,633	26,398	7,753	8,711	15,540	22,034	9,410
1990			615,603	251,635	9,930	25,202	12,492	84,817	88,436	11,081	29,095	30,973	8,006	9,913	17,698	26,142	10,183
1991			670,848	277,533	11,069	27,072	13,460	90,179	95,932	12,296	33,525	34,091	8,806	10,697	18,852	26,697	10,639
1992			744,190	313,188	11,987	29,291	14,355	98,556	111,062	13,758	35,442	37,405	9,395	11,836	18,584	28,466	10,865
1993			834,168	355,942	13,381	31,828	16,076	106,778	126,289	15,029	39,911	42,198	10,226	12,874	19,645	32,114	11,877
1994			912,675	389,185	14,620	35,044	18,664	117,674	139,632	16,893	43,140	45,143	10,629	13,848	20,862	35,005	12,336
1995			998,331	421,364	16,161	39,354	21,725	130,167	155,520	18,166	46,296	49,925	11,875	15,420	23,560	35,871	12,927
1996			1,101,077	462,981	17,640	42,867	25,504	143,960	172,496	20,380	51,096	56,844	13,770	15,758	20,657	35,380	14,062
1997			1,191,392	487,733	19,733	48,272	29,139	156,226	185,857	22,597	53,783	63,361	15,165	17,524	22,630	45,025	15,616
1998			1,244,019	491,861	20,938	51,518	30,234	167,224	200,084	24,228	57,131	70,415	16,510	18,600	23,440	44,797	16,638
1999			1,310,865	511,099	22,252	55,335	32,107	176,358	211,327	26,074	61,654	77,497	17,827	20,111	24,968	46,463	17,901
2000	1,388,117	534,262	23,231	60,089	34,639	184,468	219,572	27,241	64,564	91,399	19,867	22,296	26,970	49,857	19,227		

Source: Land Transportation Office

4.4 Motorcycles/Tricycles (MCTC) Registration Forecast

Motorcycles refer to 2-wheel motorized vehicles. Tricycles, on the other hand, are basically modified motorcycles with a single-wheeled sidecar. Tricycles are generally used for public transport while motorcycles are used privately.

MC/TC Registration Forecast: Philippines and NCR

Philippine Forecast

This vehicle type showed remarkable growth since LTO transferred its MC/TC regulatory function to the LGUs in 1991. For the past 10 years, its volume has been increasing at the rate of 13.10% annually. Its growth slowed down during the recession period but it's expected to increase at an average rate of 11% in the next 5 years assuming economic recovery. At this rate, total MC/TC volume in 2005 is projected to reach about 2,064,000 units. This is a 67% increase from its year 2000 volume of 1,236,000.

Figure 4-47

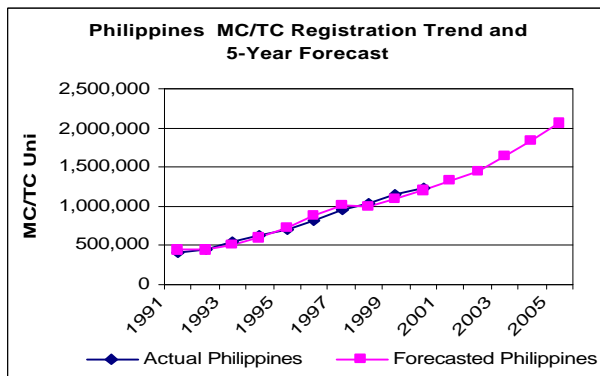


Table 4-47

Projected MC/TC Volume	Philippines	
	Volume	Ave. Annual Growth Rate
2001	1,325,935	10.82%
2002	1,454,698	
2003	1,635,481	
2004	1,836,611	
2005	2,064,125	

NCR Forecast

The volume of MC/TC in NCR had increased dramatically in 1993 and 1996 with growth rates of 21% and 23% respectively. Growth declined to 4% in 1998 but had increased modestly to 6% in 2000. In the next 5 years, it is estimated that MC/TC registration volume will increase annually by 9.86%. Figure 4-48 and Table 4-48 show the annual projected volume of MC/TC for NCR.

Figure 4-48

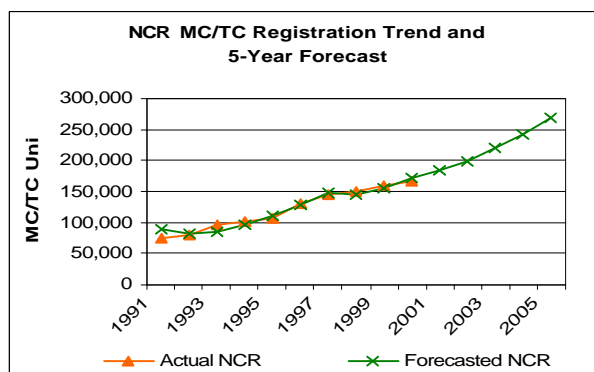


Table 4-48

Projected MC/TC Volume	NCR	
	Volume	Ave. Annual Growth Rate
2001	183,416	9.86%
2002	198,578	
2003	219,337	
2004	242,435	
2005	268,545	

MC/TC Registration Forecast: Region III, IV and VII

Region III (Central Luzon) Forecast

Motorcycles and Tricycles registration volume had grown notably in Central Luzon. Its average growth rate from 1991 to 2000 is 14.31%. It registered its highest growths of almost 25% in 1993 and 17.47% in 1996. As of the year 2000, total MC/TC volume had reached 160,460 from a volume of 48,584 in 1991. Using the time-series quadratic trend regression analysis method, it is predicted that it will grow at an annual average of 10.69% from 2001 to 2005.

Figure 4-49

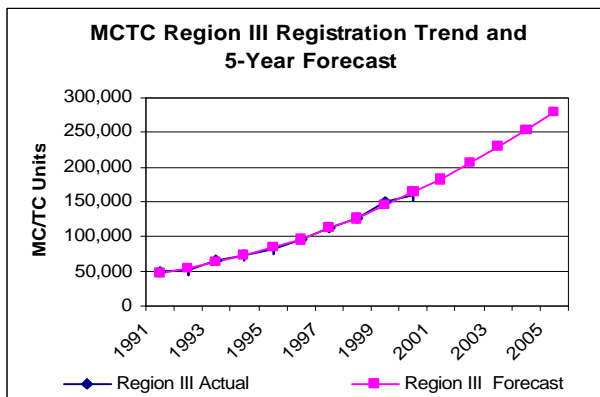


Table 4-49

Projected MC/TC Volume	Region III	
	Volume	Ave. Annual Growth Rate
2001	183,844	10.69%
2002	205,584	
2003	228,795	
2004	253,476	
2005	279,628	

Region IV (Southern Tagalog) Forecast

Southern Tagalog's MC/TC registration volume had been increasing at decreasing rates since 1996. From a growth rate of 26% it declined to 10.38% in 2000. Using the GRDP approach, it is estimated that the number of MC/TC units will increase by an average of 8.69% every year from 2001 to 2005. At this rate, registration volume is expected to reach about 240,000 units by 2005 from a volume of 173,149 units in 2000.

Figure 4-50

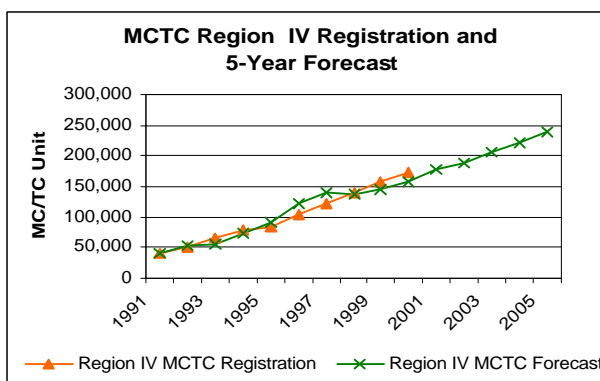


Table 4-50

Projected MC/TC Volume	Region IV	
	Volume	Ave. Annual Growth Rate
2001	178,185	8.69%
2002	189,046	
2003	205,552	
2004	222,385	
2005	239,939	

4.4.1 Summary of Correlation and Regression Analysis Between MC/TC Registration Volume and GRDP

All Class / MC/TC	Philippines	NCR	CAR	Region I	Region II	Region III	Region IV	Region V	Region VI	Region VII	Region VIII	Region IX	Region X	Region XI	Region XII
Correlation	99.05%	97.17%	98.65%	97.56%	92.84%	99.84%	97.10%	98.67%	94.19%	99.19%	98.69%	95.26%	92.91%	95.49%	97.85%
R Square	98.10%	94.42%	97.31%	95.19%	86.19%	99.69%	94.28%	97.36%	88.73%	98.39%	97.40%	90.74%	86.32%	91.19%	95.74%
Intercept	-1893128	-150917	-7401	-87600	-54686	41748.3	-320517	-143980	-181327	-165584	-66331	-87912	19410	-202063	-74770
Slope1	0.00326	0.001088	0.0007	0.00612	0.0061	4830.42	0.00337	0.00747	0.00402	0.00466	0.00468	0.0054	1763.2	0.00485	0.00435
Slope2						735.216									
Mean Absolute % Error (MAPE)	4.51%	6.22%	6.16%	7.80%	9.75%	1.83%	8.09%	4.38%	12.92%	4.83%	5.29%	11.19%	4.85%	8.17%	6.24%
Projected Volume of Motor Vehicles															
2000(actual)	1,236,241	167,848	9,410	101,024	68,982	160,469	173,149	52,837	83,627	137,567	38,273	56,824	36,949	92,264	37,342
2001	1,325,935	183,416	10,082	109,888	83,137	183,416	178,185	57,781	84,509	149,490	43,878	63,808	38,806	94,868	40,857
2002	1,454,698	198,578	11,193	120,549	91,747	198,578	189,046	63,180	90,613	162,060	48,368	69,533	40,569	102,149	45,482
2003	1,635,481	219,337	12,631	134,699	102,919	219,337	205,552	71,551	100,523	179,231	54,798	78,415	42,332	113,731	51,976
2004	1,836,611	242,435	14,231	150,446	115,353	242,435	222,385	80,861	111,543	199,265	61,506	87,756	44,095	126,611	59,201
2005	2,064,125	268,545	16,037	168,231	129,386	268,545	239,939	91,419	124,054	221,447	69,355	98,428	45,859	141,226	67,373
Motor Vehicle Registration Average Growth Rates															
1991-2000	13.10%	9.74%	15.62%	12.31%	16.66%	9.74%	17.25%	12.51%	14.71%	12.95%	13.47%	12.67%	7.36%	12.20%	11.42%
2001-2005	10.82%	9.86%	12.53%	10.75%	11.24%	9.86%	8.69%	11.60%	8.46%	9.98%	12.63%	12.94%	4.42%	8.94%	12.71%
1996-2000	11.85%	9.53%	14.56%	11.89%	13.43%	9.53%	15.81%	11.22%	13.59%	10.63%	10.95%	11.01%	5.01%	9.76%	14.34%

4.4.2 MC/TC Registration Data (1981-2000)

YEAR	CLASS	TYPE	PHILS	NCR	CAR	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
1980	ALL CLASS	MC/TC	236,472	41,655		21,379	10,329	32,169	23,280	9,964	18,090	21,390	7,158	9,102	17,000	18,564	6,392
1981			186,990	33,921		16,040	7,182	25,163	16,290	7,218	12,084	18,116	6,105	9,643	13,755	15,778	5,695
1982			218,443	38,609		18,935	10,478	30,563	19,412	9,727	14,160	19,096	7,314	11,917	13,993	18,349	5,890
1983			261,425	47,610		23,335	10,847	38,629	25,435	11,710	15,332	22,564	8,767	13,319	16,962	20,204	6,711
1984			253,333	40,433		23,725	11,918	40,288	23,305	10,652	15,022	21,291	8,764	13,457	15,942	21,321	7,215
1985			242,990	37,631		22,066	11,452	37,440	25,122	10,835	14,205	20,502	7,896	12,802	15,440	20,049	7,550
1986			288,625	43,331		27,725	13,777	47,646	30,430	12,556	19,368	23,444	8,170	14,917	15,913	23,861	7,487
1987			249,568	39,439		21,850	10,683	34,503	25,887	11,084	16,499	19,877	8,659	13,968	16,437	23,332	7,350
1988			280,902	43,688		25,353	11,825	39,953	27,120	12,134	16,237	28,484	9,485	14,894	17,120	25,206	9,403
1989			330,975	53,748	1,600	28,255	14,084	45,467	35,798	14,046	19,600	34,275	10,323	16,296	17,463	28,385	11,635
1990			382,426	66,577	2,085	32,828	16,031	48,594	39,105	16,543	21,950	43,030	11,711	18,820	19,053	33,321	12,778
1991			410,127	73,851	2,658	35,585	17,858	48,584	41,945	18,485	24,502	46,303	12,395	19,519	20,013	34,092	14,337
1992			458,938	80,387	2,483	39,812	18,458	52,114	50,926	21,145	29,799	52,167	14,626	22,305	21,862	38,549	14,305
1993			547,655	97,022	3,367	46,719	23,838	64,912	65,664	24,052	34,299	62,447	16,804	24,875	24,676	44,070	14,910
1994			624,292	102,670	3,817	52,172	31,010	72,170	77,551	26,761	40,788	70,077	19,807	29,856	28,322	52,481	16,810
1995			708,059	107,492	4,786	57,636	37,269	82,677	83,543	31,331	46,840	83,277	22,923	33,790	33,034	63,760	19,701
1996			821,599	131,768	5,791	64,424	44,075	97,118	105,180	37,388	53,753	89,861	26,967	37,367	26,687	65,571	23,268
1997			952,044	144,953	6,360	73,998	55,548	111,751	122,155	44,658	63,818	105,139	31,728	42,502	31,138	74,298	28,423
1998			1,032,594	150,618	7,498	82,521	55,957	127,144	138,859	48,317	68,000	118,278	33,542	46,512	32,987	73,607	31,033
1999			1,144,666	158,807	8,522	90,609	60,976	149,275	156,869	50,744	77,752	130,274	36,891	53,685	35,412	83,301	34,028
2000	1,236,241	167,848	9,410	101,024	68,982	160,469	173,149	52,837	83,627	137,567	38,273	56,824	36,949	92,264	37,342		

Source: Land Transportation Office

4.5 Bus Registration Forecast

Bus refers to passenger motor vehicle with a capacity of more than 18 passengers. Buses are generally used for public transport.

Bus Registration Forecast: Philippines and NCR

Initial forecast results show that volume of bus units in the entire country is predicted to grow annually at an average of 6%. This translates to a volume of 46,240 in 2005 as compared with the 33,888 units in 2000. However, considering that about 35% of total units belong to NCR, majority of which are for hire, the volume may be overestimated, as there are existing and future factors that restrict the growth of bus units in the metropolis.

These factors are as follows:

- The development and expansion of mass transit systems particularly MRT 3.
- DOTC Bus Route Rationalization Program
- Vehicle age requirement as provided by the Clean Air Act.
- Implementation of stricter emission standards

Since MRT 3 started its full operation in 2000, it is estimated that about 25% of total bus units in NCR will be displaced by 2001. After which, it will grow annually by 7.64% due to population and economic growth. Figure 4-62 and 63 illustrate the rightward shift of the forecast curve as a result of the MRT operation along EDSA. The national forecast was adjusted accordingly as shown in Table 4-62.

Figure 4-62

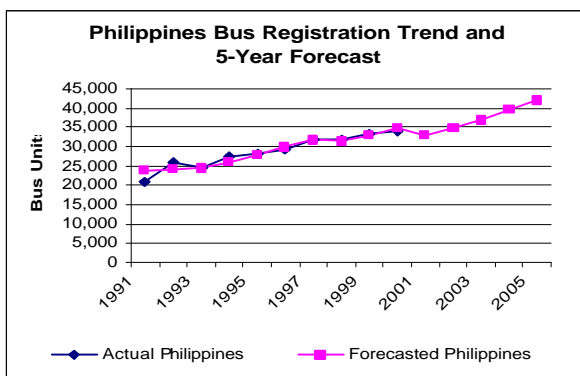


Table 4-62

Projected Bus Fleet	Philippines	
	Volume	Ave. Annual Growth Rate
2001	33,060	4.16%
2002	34,658	
2003	36,902	
2004	39,399	
2005	42,223	

Figure 4-63

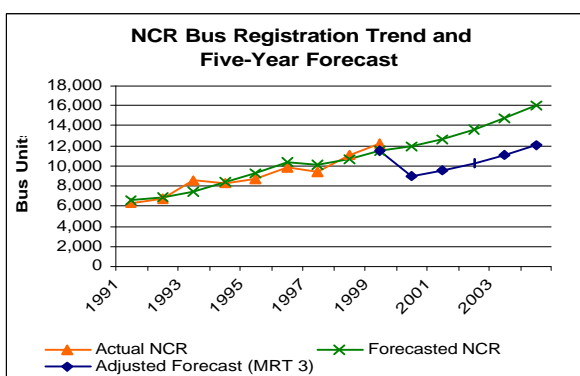


Table 4-63

Projected Bus Fleet	NCR	
	Volume	Ave. Annual Growth Rate
2001	8,979	7.64%
2002	9,515	
2003	10,268	
2004	11,106	
2005	12,053	