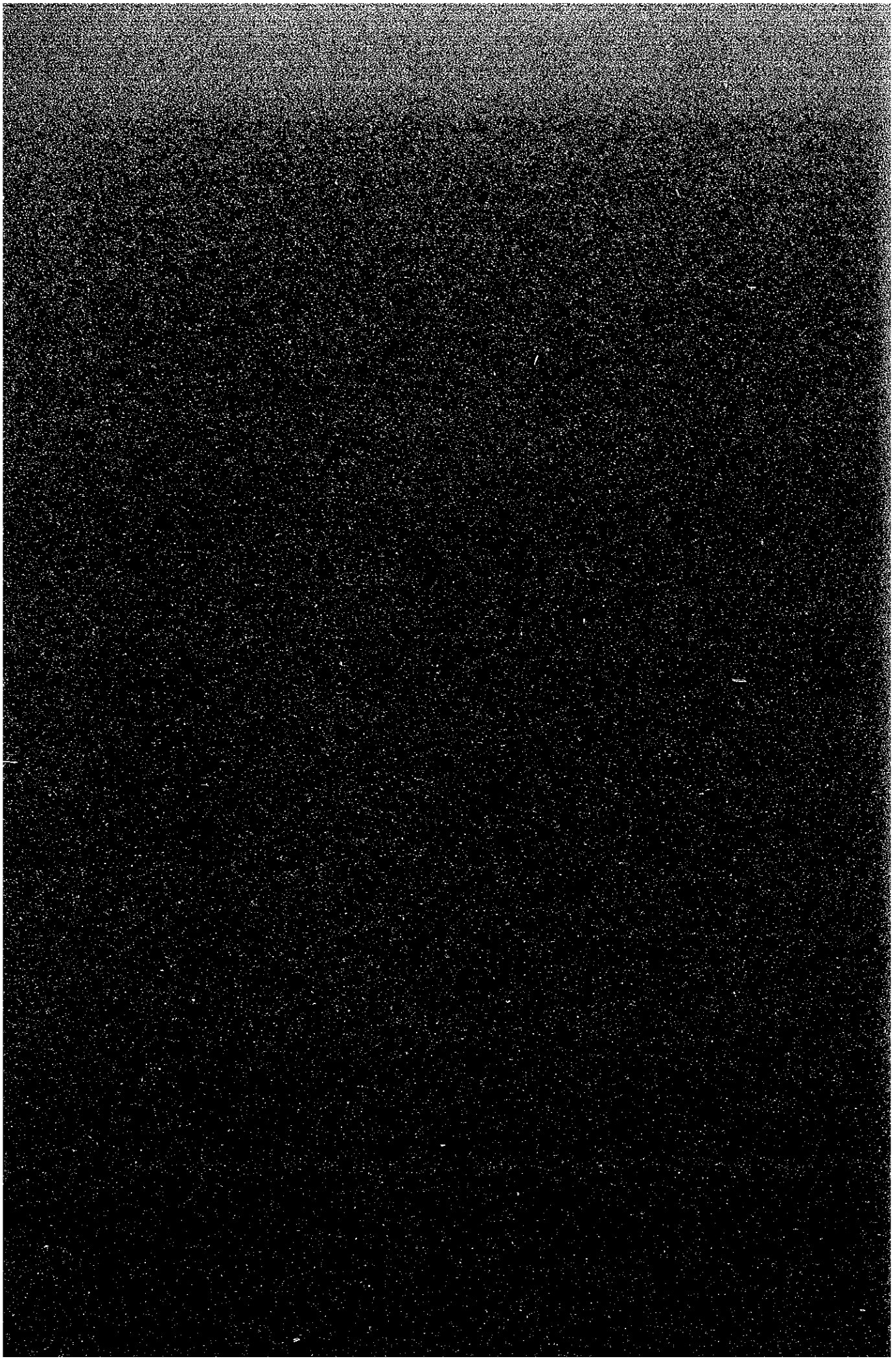
# APPENDIXES FOR CHAPTER 4



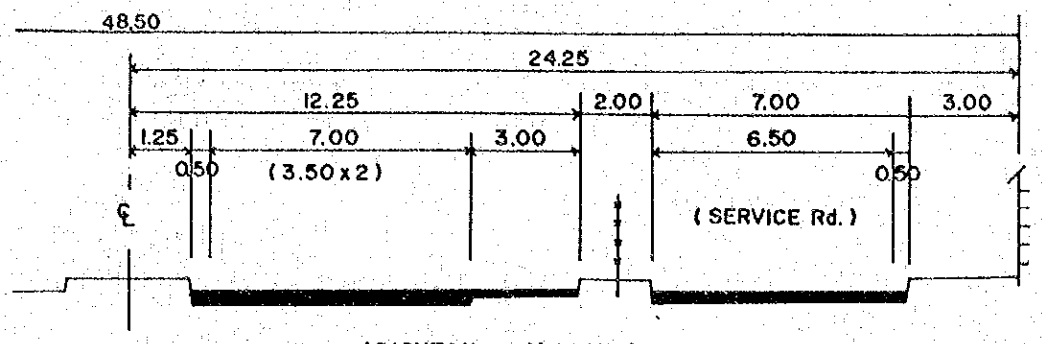
APPENDIX TABLE 4.1-1 INVENTORY DATA OF EXISTING ROADS

| ROAD NAME | CARRIAGEWAY WIDTH(M) | SHOULDER WIDTH(M) | SIDE CLEARANCE (M) | SIDE-WALK(M) | PAVEMENT |
|---|---|---|---|---|---|
| Quirino Avenue | 2 lane 7.0 | 1.75-0.75 | 1.75-0.75 | partially 1 - 1.5 | Asphalt |
| Imelda Avenue | 2 lane 6.7 | 3.0 | 3.0 | - | Asphalt |
| South Luzon Expressway | 4 lane 2x7.0 or 7.3 | 3.0 | 3.0 | - | Concrete |
| Service Road Outside South Luzon Expwy | 2 lane 6.5 | 0.5 | 0.5 | partially 3.0 | Asphalt |
| Route - 303 | 2 lane 6.5 | 0.5 | 0.5 | - | Asphalt |
| Hwy - 1 | 2 lane 6.3 | 2.5 - 3.0 | 2.5 - 3.0 | - | Asphalt |
| Hwy - 17 | 2 lane 7.0 | 1.5 - 3.0 | 1.5 - 3.0 | - | Asphalt |
| Hwy - 25 | 2 lane 6.70 - 7.0 | 1.5 - 2.0 | 1.5 - 2.0 | - | Asphalt & Concrete |
| Naic Carmona | 2 lane 6.0 | 1.0 - 1.5 | 1.0 - 1.5 | - | Asphalt |
| Parañaque - Sucat | 2 lane 6.7 | 1.5 - 4.5 | 1.5 - 4.5 | - | Concrete |
| Zapote - Alabang | 2 lane 6.0 | 3.0 - 5.5 | 3.0 - 5.5 | - | Concrete |

Remarks: Asphalt - - Asphalt Concrete Pavement

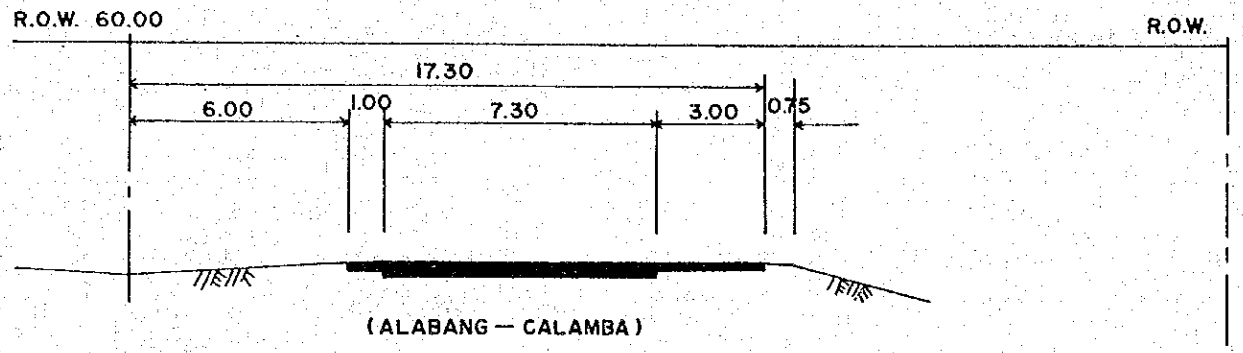
Concrete - Portland Cement Concrete Pavement

APPENDIX FIG. 4.1–1 TYPICAL CROSS SECTION OF EXISTING ROADS



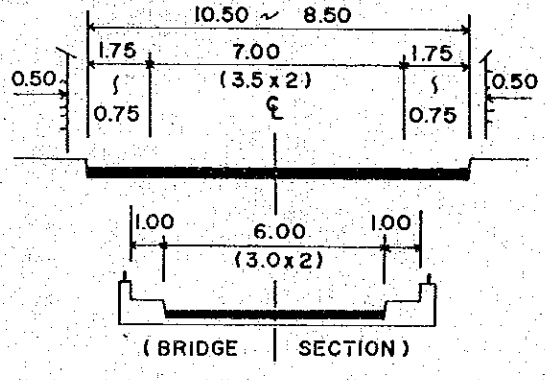

SCALE: 1:200

(BICUTAN — ALABANG)

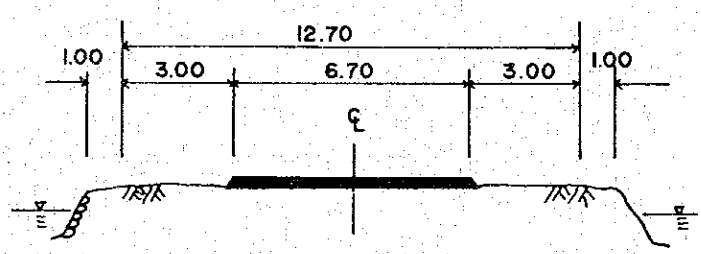



(ALABANG — CALAMBA)

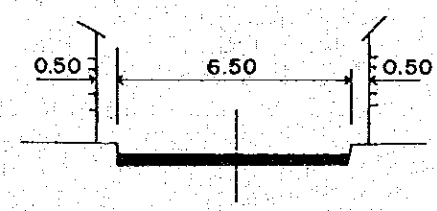
SOUTH LUZON EXPRSSWAY




(BRIDGE SECTION)

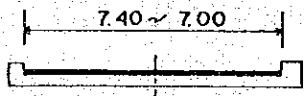



IMELDA AVENUE

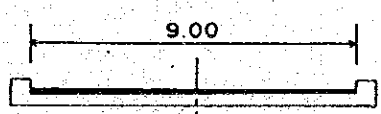



ROUTE 303

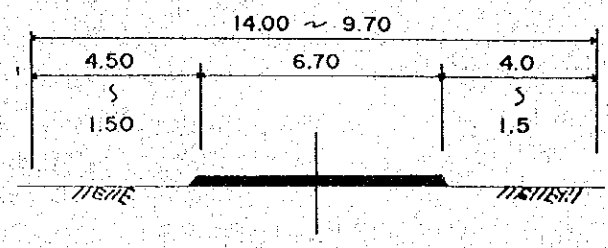
QUIRINO AVENUE



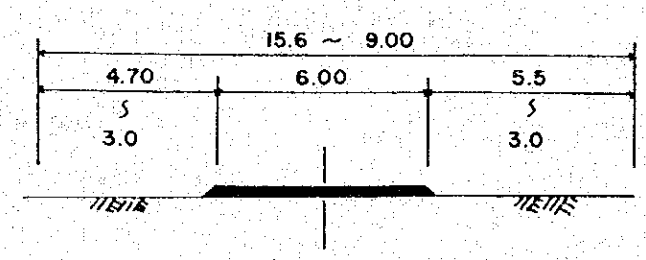

(BRIDGE SECTION)




(BRIDGE SECTION)




PARANAQUE - SUCAT ROAD




ZAPOTE - ALABANG ROAD

APPENDIX TABLE 4.2–1 REGISTERED VEHICLES, PHILIPPINES

| YEAR | CARS | TRUCKS | TRAILERS | SUB-TOTAL | MOTOR CYCLES | TOTAL | ANNUAL |
|---|---|---|---|---|---|---|---|
| 1971 | 289,381 | 185,189 | 14,070 | 488,640 | 95,486 | 588,336 | 1.00 |
| 1972 | 312,137 | 204,391 | 13,358 | 529,886 | 128,750 | 657,934 | 1.12 |
| 1973 | 332,233 | 239,114 | 13,740 | 585,087 | 150,155 | 735,241 | 1.12 |
| 1974 | 397,603 | 272,889 | 17,477 | 687,969 | 164,484 | 852,253 | 1.16 |
| 1975 | 399,574 | 272,303 | 14,520 | 686,397 | 176,751 | 865,027 | 1.02 |
| 1976 | 402,328 | 290,619 | 14,597 | 707,544 | 177,822 | 885,386 | 1.02 |
| 1977 | 440,466 | 327,925 | 17,151 | 795,542 | 200,923 | 986,466 | 1.11 |
| 1978 | 493,374 | 369,351 | 20,525 | 883,250 | 235,357 | 1,118,607 | 1.13 |
| 1979 | 504,895 | 410,199 | 22,144 | 937,238 | 249,558 | 1,186,796 | 1.06 |

Source: Land Transport Commission

APPENDIX TABLE 4.2–2 REGISTERED VEHICLES, REGIONS IV AND IV–A

| YEAR | REGION | CARS | TRUCKS | TRAILERS | SUB-TOTAL | MOTOR CYCLES | TOTAL | INDEX |
|---|---|---|---|---|---|---|---|---|
| 1977 | IV | 241,911 | 115,102 | 6,301 | 363,314 | 39,378 | 402,692 | 1.00 |
| | IV-A | 25,294 | 31,954 | 1,378 | 58,626 | 19,630 | 78,256 | 1.00 |
| | TOTAL | 267,205 | 147,056 | 7,679 | 421,940 | 59,008 | 480,948 | 1.00 |
| 1978 | IV | 278,727 | 137,995 | 7,287 | 424,009 | 50,607 | 474,616 | 1.18 |
| | IV-A | 25,051 | 36,702 | 1,954 | 63,707 | 21,832 | 85,539 | 1.09 |
| | TOTAL | 303,778 | 174,697 | 9,241 | 487,716 | 72,439 | 560,155 | 1.16 |
| 1979 | IV | 287,029 | 148,054 | 6,933 | 442,016 | 47,883 | 489,899 | 1.22 |
| | IV-A | 35,019 | 44,907 | 2,354 | 82,280 | 21,919 | 104,199 | 1.33 |
| | TOTAL | 322,948 | 192,961 | 9,287 | 524,296 | 69,802 | 594,098 | 1.24 |
| 1980 1) | IV | 298,100 | 100,715 | 5,721 | 404,536 | 41,606 | 446,142 | 1.11 |
| | IV-A | 53,991 | 35,091 | 215 | 89,297 | 25,278 | 114,575 | 1.46 |
| | TOTAL | 351,091 | 135,806 | 5,936 | 493,833 | 66,884 | 560,717 | 1.17 |

Sources: Land Transport Commission

Note : 1) Preliminary Figures

APPENDIX TABLE 4.2-3A TRAFFIC VOLUME (AADT) ON MAJOR ROADS

(Vehicle Unit)

| Survey Station | Vehicle Type | Jeepney | Bus | Sm. Veh. | Truck | Total |
|---|---|---|---|---|---|---|
| A1 | Parañaque (Quirino Ave) | 12,716 | 2,605 | 15,648 | 1,005 | 31,974 |
| A3 | Bicutan (Service Rd-West) | 2,722 | 209 | 5,687 | 1,477 | 10,095 |
| A4 | Bicutan (Service Rd-East) | 3,136 | 754 | 2,240 | 926 | 7,056 |
| A5 | (Route 303) | 2,434 | 19 | 701 | 175 | 3,329 |
| A6 | Bicutan (Luzon South Expressway) | 3,677 | 3,098 | 29,639 | 3,245 | 39,659 |
| A1-A6 | T o t a l | 29,284 | 6,789 | 69,253 | 7,852 | 113,178 |
| B1 | Parañaque- (Sucat Road) | 5,597 | 57 | 7,207 | 1,147 | 14,008 |
| B2 | Zapote- (Alabang Road) | 6,645 | 328 | 5,333 | 1,178 | 13,484 |
| B1-B2 | T o t a l | 12,242 | 385 | 12,540 | 2,325 | 27,492 |
| C1 | Parañaque- (Sucat Road) | 5,311 | 291 | 16,913 | 1,839 | 24,354 |
| C2 | | 689 | 214 | 1,226 | 322 | 2,451 |
| D1 | Alabang (Service Road-West) | 1,854 | 186 | 1,678 | 559 | 4,277 |
| D2 | Alabang (Service Road-East) | 4,512 | 578 | 1,297 | 698 | 7,085 |
| D3 | Zapote (Alabang Road) | 6,044 | 253 | 8,339 | 1,527 | 16,163 |
| D4 | Zapote (Alabang Road) | 1,953 | 47 | 1,504 | 207 | 3,711 |
| D5 | Alabang (Hwy 1 ) | 9,129 | 2,374 | 9,556 | 2,743 | 23,802 |
| IS-1 | Parañaque MNL(A-2) | 4,599 | 104 | 15,338 | 1,024 | 21,065 |
| | Parañaque Sucat | 5,976 | 112 | 13,894 | 1,081 | 20,883 |
| | Parañaque Quirino | 2,377 | 81 | 4,688 | 276 | 7,422 |
| IS-2 | Zapote MNL | 14,536 | 2,856 | 12,420 | 1,288 | 31,100 |
| | Zapote Alabang | 7,101 | 419 | 7,165 | 1,211 | 15,896 |
| | Zapote Bacoor | 10,105 | 2,825 | 10,963 | 1,543 | 25,436 |

Source: Study Team traffic count in May 1981.

Remarks: The traffic count for 16 hours are shown in Appendix Table 4.2-4

APPENDIX TABLE 4.2–3B TRAFFIC COMPOSITION BY VEHICLE TYPE

| Survey Station | | | Name of Road / Vehicle Type | Sm. Veh | BUS | JEEPNEY | TRUCK | TOTAL |
|---|---|---|---|---|---|---|---|---|
| Screen A-A Section | West Side Roads | A1 | Quirino Ave. (Parañaque) | 15,648 | 2,605 | 12,716 | 1,005 *1) | 31,974 |
| | | | | (49.0) | (8.1) | (39.8) | (3.1) *2) | (100.0) |
| | | IS-1 | Imelda Ave. (Parañaque) | 15,338 | 104 | 4,599 | 1,024 | 21,065 |
| | | | | (72.8) | (0.5) | (21.8) | (4.9) | (100.0) |
| | | Sub Total | | 30,986 | 2,709 | 17,315 | 2,029 | 53,039 |
| | | | | (58.5) | (5.1) | (32.6) | (3.8) | (100.0) |
| | East Side Roads | A3 + A4 | South Luzon Hwy Service Road(Bicutan) | 7,927 | 963 | 5,858 | 2,403 | 17,151 |
| | | | | (46.2) | (5.6) | (34.2) | (14.0) | (100.0) |
| | | A5 | Route 303 (Bicutan) | 701 | 19 | 2,434 | 175 | 3,329 |
| | | | | (21.1) | (0.6) | (73.0) | (5.3) | (100.0) |
| | | A6 | South Luzon Highways (Bicutan) | 29,639 | 3,098 | 3,677 | 3,245 | 39,659 |
| | | | | (74.7) | (7.8) | (9.3) | (8.2) | (100.0) |
| | | Sub Total | | 38,267 | 4,080 | 11,969 | 5,823 | 60,139 |
| | | | | (63.6) | (6.8) | (19.9) | (9.7) | (100.0) |
| | TOTAL | | | 69,253 | 6,789 | 29,284 | 7,852 | 113,178 |
| | | | | (61.2) | (6.0) | (25.9) | (6.9) | (100.0) |
| Screen B-B Section | B1 | | Parañaque -Sucat Road | 7,207 | 57 | 5,597 | 1,147 | 14,008 |
| | | | | (51.4) | (0.4) | (40.0) | (8.2) | (100.0) |
| | B2 | | Zapote -Alabang Road | 5,333 | 328 | 6,645 | 1,178 | 13,484 |
| | | | | (39.6) | (2.4) | (49.3) | (8.7) | (100.0) |
| | TOTAL | | | 12,540 | 385 | 12,242 | 2,325 | 27,492 |
| | | | | (45.6) | (1.4) | (44.5) | (8.5) | (100.0) |

Remarks: The figure indicated - AADT (Veh/day) in 1981.

The percentage share of vehicle type is indicated in ( ).

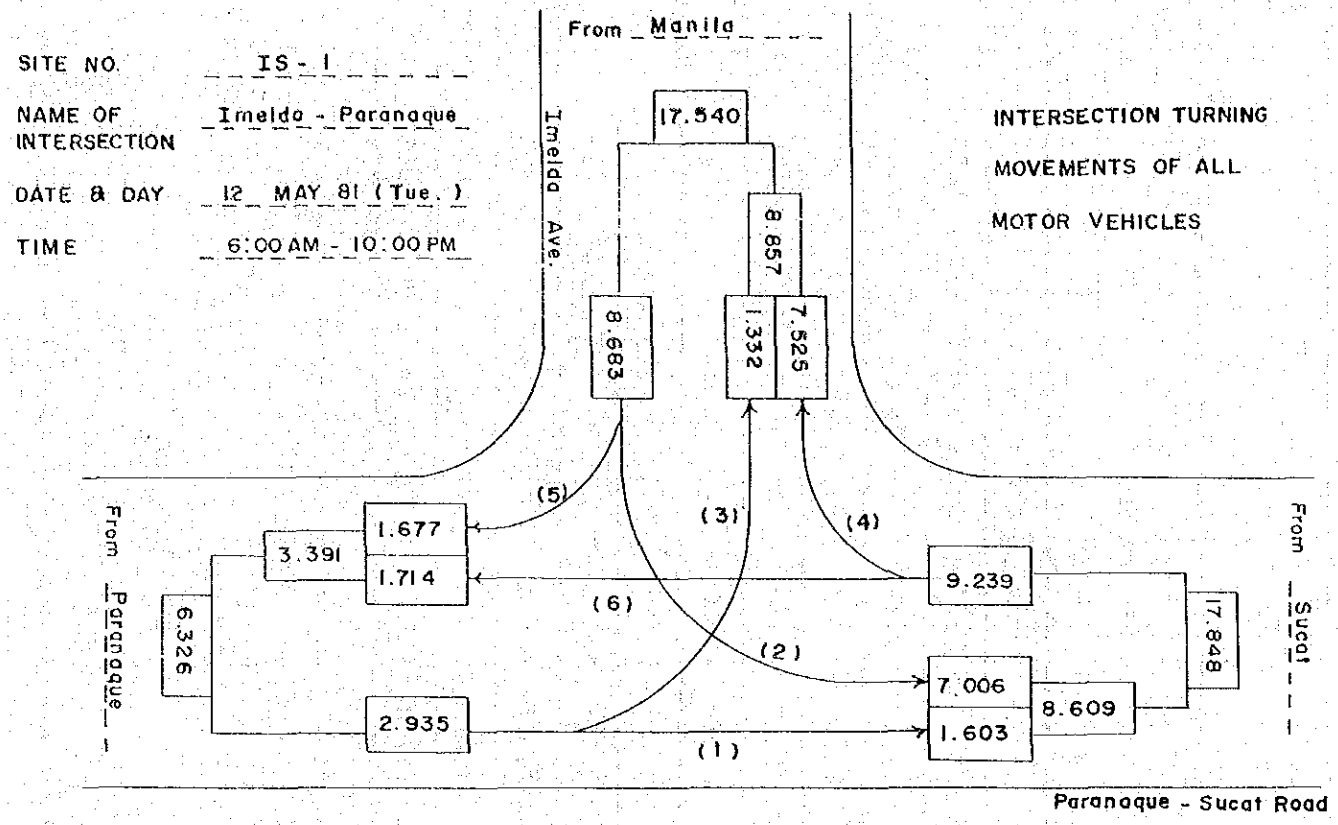
APPENDIX TABLE 4.2-4 TRAFFIC VOLUME (16 HR.) FROM THE SURVEY IN 1981

| NAME OF ROAD (SITE NO.) | DIRECTION | TRAFFIC VOLUME (16 HOURS) | PEAK HOUR | | | REMARKS |
|---|---|---|---|---|---|---|
| | | | HOUR | TRAFFIC VOLUME | RATIO (%) | |
| QUIRINO AVENUE (A-1) | PARAÑAQUE → MANILA | 13,458 | 7-8 | 1,434 | 10.7 | |
| | MANILA → PARAÑAQUE | 13,204 | 18-19 | 1,236 | 9.3 | |
| SOUTH SUPER WEST SIDE ROAD (A-3) | ALABANG → MANILA | 3,893 | 8-9 | 433 | 11.1 | |
| | MANILA → ALABANG | 5,061 | 10-11 | 408 | 8.1 | |
| SOUTH SUPER EAST SIDE ROAD (A-4) | ALABANG → MANILA | 3,579 | 8-9 | 331 | 9.2 | |
| | MANILA → ALABANG | 2,647 | 18-19 | 215 | 8.1 | |
| NATIONAL ROAD 303 (A-5) | SUCAT → MANILA | 1,325 | 8-9 | 148 | 11.2 | |
| | MANILA → SUCAT | 1,603 | 8-9 | 145 | 9.0 | |
| SOUTH SUPER EXPRESSWAY (A-6) | SUCAT → MANILA | 16,943 | 17-18 | 1,799 | 10.7 | |
| | MANILA → SUCAT | 18,188 | 8-9 | 2,782 | 15.3 | |
| PARAÑAQUE-SUCAT ROAD (B-1) | PARAÑAQUE → SUCAT | 6,112 | 16-17: 18-19: | 464 | 7.6 | |
| | SUCAT → PARAÑAQUE | 6,365 | 18-19 | 528 | 8.3 | |
| ALABANG-ZAPOTE ROAD (HWY-1) (B-2) | ALABANG → ZAPOTE | 5,989 | 17-18 | 512 | 8.5 | |
| | ZAPOTE → ALABANG | 5,952 | 16-17 | 504 | 8.5 | |
| SUCAT (IS3) C - 1 | SUCAT → PARAÑAQUE | 10,117 | 18-19 | 970 | 9.6 | |
| | PARAÑAQUE → SUCAT | 10,866 | 8-9 | 1,429 | 13.2 | |
| SUCAT (IS4) C - 2 | TAGUIG → SUCAT | 984 | 7-8 | 107 | 10.9 | |
| | SUCAT → TAGUIG | 1,141 | 6-7 | 126 | 11.0 | |
| ALABANG (IS-4) D - 1 | ALABANG → MANILA | 1,167 | 17-18 | 137 | 11.7 | |
| | MANILA → ALABANG | 2,571 | 8-9 | 225 | 8.8 | |
| ALABANG (IS-4) D - 2 | ALABANG → MANILA | 4,352 | 7-8 | 393 | 9.0 | |
| | MANILA → ALABANG | 1,777 | 6-7 | 232 | 13.0 | |
| ALABANG (IS-4) D - 3 | ALABANG → ZAPOTE | 6,625 | 18-19 | 743 | 11.4 | |
| | ZAPOTE → ALABANG | 7,349 | 7-8 | 1,053 | 14.3 | |
| ALABANG (IS-4) D - 4 | TAGUIG → ALABANG | 1,707 | 7-8 | 169 | 9.9 | |
| | ALABANG → TAGUIG | 1,497 | 8-9 | 150 | 10.0 | |
| ALABANG (IS-5) D - 5 | ALABANG → LAGUNA | 10,490 | 17-18 | 911 | 8.7 | |
| | LAGUNA → ALABANG | 10,162 | 7-8 | 1,113 | 11.0 | |

APPENDIX TABLE 4.2–5 DAILY TRAFFIC FACTOR

| Survey Position | Traffic Volume / Direction / Vehicle Type | A (TO MANILA) Small Vehicle | A BUS | A JEEPNEY | A TRUCK | A TOTAL | B (FROM MANILA) Small Vehicle | B BUS | B JEEPNEY | B TRUCK | B TOTAL | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| East-Side | 16 hour Volume (AM6-PM10) | 2,591 | 353 | 2,846 | 707 | 6,497 | 2,229 | 444 | 3,074 | 915 | 6,662 | MMUTIP through TEMP of MPWH (24 hour Survey) October 1920 |
| San Pedro | 24 hour Volume | 2,783 | 433 | 3,346 | 838 | 7,400 | 2,533 | 499 | 3,473 | 1,044 | 7,549 | |
| (CH-10) | FACTOR (24h/16h) | 1.074 | 1.227 | 1.176 | 1.185 | 1.139 | 1.136 | 1.124 | 1.130 | 1.141 | 1.133 | |
| West-Side | 16 hour Volume (AM6-PM10) | 4,779 | 1,236 | 3,937 | 414 | 10,366 | 4,922 | 1,320 | 4,660 | 421 | 11,323 | |
| Bacoor | 24 hour Volume | 5,185 | 1,329 | 4,768 | 481 | 11,763 | 5,594 | 1,408 | 5,206 | 511 | 12,719 | " |
| (CH-11) | FACTOR (24h/16h) | 1.085 | 1.075 | 1.211 | 1.162 | 1.135 | 1.136 | 1.067 | 1.117 | 1.214 | 1.123 | |
| South Luzon Expressway | 16 hour Volume (AM6-PM10) | 13,524 | 1,443 | 1,644 | 1,577 | 18,188 | 12,448 | 1,644 | 1,580 | 1,271 | 16,943 | 16 hour: Counting Survey May'81 |
| | 24 hour Volume | 17,432 | 1,494 | 2,109 | 1,850 | 22,885 | 15,684 | 1,968 | 1,999 | 1,776 | 21,427 | 24 hour: Volume by CDCP APRIL '81 |
| (A-6) | FACTOR(24h/16h) | 1,289 | 1.035 | 1.283 | 1.173 | 1,258 | 1,260 | 1.197 | 1.265 | 1.397 | 1.265 | |

APPENDIX FIG. 4.2-1 TRAFFIC VOLUME (16 HR.) AT PARANAQUE INTERSECTION BY THE SURVEY IN 1981




TRAFFIC VOLUME (16 hr.) ; PARANAQUE INTERSECTION (1981)

| SITE NO | DIRECTION | | TRAFFIC VOLUME (16 HOURS) | PEAK HOUR | | |
|---|---|---|---|---|---|---|
| | | | | HOUR | TRAFFIC VOLUME | RATIO (%) 1) |
| IS-1 | PARAÑAQUE → SUCAT | (1) | 1,603 | 7-8 | 136 | 8.5 |
| " | MANILA → SUCAT | (2) | 7,006 | 18-19 | 764 | 10.9 |
| " | PARANAQUE → MANILA | (3) | 1.332 | 7-8 | 223 | 16.7 |
| " | SUCAT → MANILA | (4) | 7,525 | 7-8 | 963 | 13.0 |
| " | MANILA → PARAÑAQUE | (5) | 1,677 | 18-19 | 197 | 11.7 |
| " | SUCAT → PARAÑAQUE | (6) | 1,714 | 8-9 | 151 | 8.8 |

**Note: 1) The ratio is calculated using the 16 hour volume.**

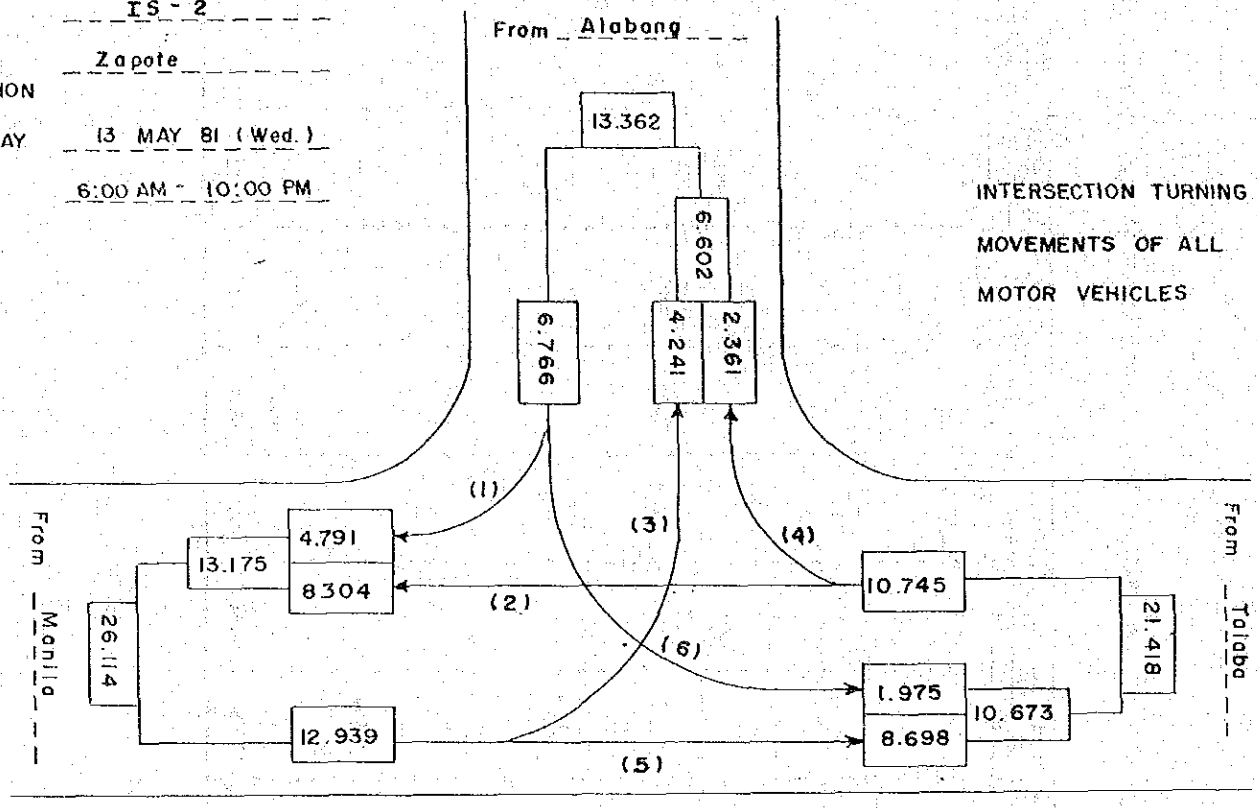
APPENDIX FIG. 4.2-2 TRAFFIC VOLUME (16 HR.) AT ZAPOTE INTERSECTION BY THE SURVEY IN 1981

SITE NO. IS - 2

NAME OF INTERSECTION Zapote

DATE & DAY 13 MAY 81 (Wed.)

TIME 6:00 AM - 10:00 PM




TRAFFIC VOLUME (16 Hr.); ZAPOTE INTERSECTION (1981)

| SITE NO | DIRECTION | | TRAFFIC VOLUME (16 HOURS) | PEAK HOUR HOUR | PEAK HOUR TRAFFIC VOLUME | PEAK HOUR RATIO (%) 1) |
|---|---|---|---|---|---|---|
| IS-2 | ALABANG ⟶ MANILA | (1) | 4,791 | 7-8 | 484 | 10.1 |
| " | TALABA ⟶ MANILA | (2) | 8,384 | 7-8 | 871 | 10.4 |
| " | MANILA ⟶ ALABANG | (3) | 4,241 | 18-19 | 421 | 9.9 |
| " | TALABA ⟶ ALABANG | (4) | 2,361 | 7-8 | 201 | 8.5 |
| " | MANILA ⟶ TALABA | (5) | 8,698 | 18-19 | 813 | 9.3 |
| " | ALABANG ⟶ TALABA | (6) | 1,975 | 14-15 | 163 | 8.3 |

Note: 1) The ratio is calculated using the 16 hour volume.

## APPENDIX TABLE 4.2-6 ANNUAL AND MONTHLY CHANGES OF TRAFFIC ON THREE STATIONS ADJACENT TO THE PROJECT ROADS: ADT

| | Station 2400 (D11), Laguna 1) Sta. Rosa - Cabuyao-Calamba 47.000 | | | | | Station KB 94 (1618), Cavite 1) Kawit-Noveleta, Km 24.900 | | | | | Station 2413 Laguna 2) Bdry - Rizal - San Pedro - 33.000 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1978 | 1979 | 1980 | 1981 | | 1978 | 1979 | 1980 | 1981 | 81/78 | 1978 | 1979 | 1980 | 1981 | 81/78 |
| Jan | | 9261<br>1.031 | | | | | | | | | | | | | |
| Feb | 16035 | 9895<br>1.095 | | | | 15906<br>1.167 | 15906<br>1.506 | | | | | | | | |
| Mar | 17178 | 9768<br>1.087 | | | 80/79 | | | | | | | | | | |
| April | 19484 | 9942<br>1.107 | 7789<br>1.027 | 7712<br>1.017 | 0.78 | | | | | | | | | | |
| May | | 9354<br>1.041 | 8282<br>1.092 | 7874<br>1.038 | 0.84 | | | | 10746 | | | | 8866 | 7692 | |
| June | | 9403<br>1.047 | 7746<br>1.021 | 7530<br>0.993 | 0.80 | 10525<br>0.883 | 10110<br>0.950 | | | | 8358 | 7776 | | | |
| July | 7725<br>0.914 | 8542<br>0.929 | 8371<br>1.103 | | 80/78<br>1.08 | | | | | | | | | | |
| Aug | 8247<br>0.976 | 7193<br>0.801 | 7263<br>0.957 | | 0.88 | | | | | | | | | | |
| Sept | 8015<br>0.948 | 8299<br>0.924 | 7021<br>0.926 | | 0.88 | 8652<br>0.72 | 9925<br>0.932 | | | | | | | | |
| Oct | | 8336<br>0.928 | 7268<br>0.958 | | | | | | | | | | | | |
| Nov | | 9568<br>1.065 | 7251<br>0.956 | | | | | 10619 | | | | | 6920 | | |
| Dec | 9816<br>1.162 | 8490<br>0.945 | 7283<br>0.960 | | 0.74<br>81/78 | 14586<br>1.224 | 8652<br>0.813 | | | | 8581<br>16936 | 6936 | | | |
| MMan | 8451<br>1.000 | 8983<br>1.000 | 7586<br>1.000 | 7705<br>1.000 | 0.91 | 11917<br>1.000 | 10648 | 10619 | 10746 | 0.90 | 8470 | 7356 | 7893 | | |

Notes: 1) The control stations. In May AADT factor is 1/1.041 = 0.961

2) The coverage station.

Source: Planning and Design Division, Region IV-A, MPH, July 1980.

APPENDIX TABLE 4.2–7 ANNUAL AND MONTHLY CHANGES OF TRAFFIC ON TWO CONTROL STATIONS IN MMA

| | NO. 32 ESPANA AVENUE | | | | | NO. 38 TAFT AVENUE | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1978 | 1979 | 1980 | 1981 | 81/78 | 1978 | 1979 | 1980 | 1981 | 81/78 |
| Jan. | 79929 | | 75556 | 63395 | 0.79 | 75556 | - | 75193 | - | |
| | 1.017 | | 0.990 | 0.857 | | 1.316 | | 1.167 | | |
| Feb. | 80569 | | 75456 | 81678 | 1.01 | | 51704 | 76353 | 51551 | |
| | 1.025 | | 0.989 | 1.105 | | | 1.010 | 1.185 | 0.918 | |
| March | 76932 | | 75753 | 79802 | 1.04 | | 50623 | 54563 | 57227 | |
| | 0.979 | | 0.992 | 1.079 | | | 0.988 | 0.847 | 1.020 | |
| April | 77715 | 77625 | 74790 | 62623 | 0.81 | | 49832 | 51668 | 57472 | |
| | 0.989 | 1.021 | 0.980 | 0.847 | | | 0.973 | 0.802 | 1.024 | |
| May | 77768 | 76903 | 78643 | 80273 | 1.03 | 51861 | 49748 | | 57392 | 1.11 |
| | 0.990 | 1.011 | 1.030 | 1.086 | | 0.903 | 0.971 | | 1.022 | |
| June | | 77761 | 83619 | 75838 | | 50575 | 51643 | | 57007 | 1.13 |
| | | 1.022 | 1.096 | 1.026 | | 0.881 | 1.008 | | 1.016 | |
| July | | 76350 | 83171 | | | 51704 | 50834 | | | |
| | | 1.004 | 1.090 | | | 0.900 | 0.992 | | | |
| Aug | | 75220 | 63630 | | | | 51879 | | | |
| | | 0.989 | 0.834 | | | | 1.013 | | | |
| Sept | | 74490 | | | | | 51510 | | | |
| | | 0.979 | | | | | 1.006 | | | |
| Oct | | 75534 | | | | | 51379 | | | |
| | | 0.993 | | | | | 1.003 | | | |
| Nov | | 74953 | | | | | 52112 | | | |
| | | 0.985 | | | | | 1.017 | | | |
| Dec | | 75694 | | | | | 52192 | | | |
| | | 0.952 | | | | | 1.019 | | | |
| Mean | 78583 | 76059 | 76327 | 73935 | 81/79 | 57424 | 51223 | 64444 | 56130 | 81/79 |
| | 1.000 | 1.000 | 1.000 | 1.000 | 0.97 | 1.000 | 1.000 | 1.000 | 1.000 | 1.10 |
| | (1.000) | (0.968) | (0.971) | (0.941) | 0.97 | (1.000) | (0.892) | (1.122) | (0.977) | |

Notes: 1) Bothways, ADT in each month. Counted by the automatic counting machine. There were no countings in some months due to the failure of machines, construction works, etc.

Source: Metro Manila Traffic Engineering and Management Project, MPH.

APPENDIX TABLE 4.2-8 AVERAGE NUMBER OF PASSENGERS PER VEHICLE

| VEHICLE TYPE \ STATION | OD-1 (Parañaque) | | OD-2 (Zapote) | | OD-3 (Alabang) | | OD-4 (Sucat) | | T O T A L | | Average Pass/Veh |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Veh. | Pass. | Veh. | Pass. | Veh. | Pass. | Veh. | Pass. | Veh. | Pass. | |
| JEEPNEY | 12,365 | 130,191 | 11,177 | 109,196 | 8,337 | 67,302 | 7,873 | 58,616 | 39,752 | 365,305 | 9.2 |
| C A R | 11,047 | 31,065 | 11,497 | 37,419 | 6,950 | 18,073 | 6,066 | 17,633 | 35,560 | 104,190 | 2.9 |
| B U S | 1,667 | 59,288 | 3,038 | 107,240 | 1,251 | 26,770 | 1,030 | 18,882 | 6,986 | 212,180 | 30.4 |
| TRUCK | 677 | 1,841 | 912 | 2,853 | 2,222 | 5,837 | 1,489 | 4,918 | 5,300 | 15,449 | 2.9 |
| T O T A L | 25,756 | 222,385 | 26,624 | 256,708 | 18,760 | 117,982 | 16,458 | 100,049 | 87,598 | 697,124 | 8.0 |

APPENDIX TABLE 4.2-9 TRIP-PURPOSE DISTRIBUTION

A. PASSENGER CARS (Car/Jeep/Taxi)

(Vehicles Unit)

| STATION \ DIRECTION 2) \ PURPOSE | | HOME | WORK | SCHOOL | BUSINESS | OTHERS | TOTAL |
|---|---|---|---|---|---|---|---|
| OD-1 (Parañaque) | A | 667 | 1,950 | 105 | 1,712 | 1,673 | 6,107 |
| | B | 1,215 | 486 | 27 | 1,539 | 1,673 | 4,940 |
| OD-2 (Zapote) | A | 1,064 | 1,299 | 89 | 1,720 | 1,255 | 5,427 |
| | B | 2,194 | 332 | 31 | 1,059 | 2,454 | 6,070 |
| OD-3 (Alabang) | A | 551 | 519 | 14 | 930 | 674 | 2,688 |
| | B | 1,305 | 1,038 | 10 | 1,150 | 759 | 4,262 |
| OD-4 (Sucat) | A | 435 | 618 | 22 | 1,230 | 386 | 2,703 |
| | B | 565 | 1,127 | 33 | 1,029 | 609 | 3,363 |
| TOTAL 1) | A | 2,717 (16.1) | 4,386 (25.9) | 230 (1.4) | 5,592 (33.0) | 3,988 (23.6) | 16,925 (100) |
| | B | 5,279 (28.3) | 2,983 (16.0) | 101 (0.6) | 4,777 (25.6) | 5,495 (29.5) | 18,635 (100) |
| | A + B | 7,996 (22.5) | 7,369 (20.7) | 331 (0.9) | 10,369 (29.2) | 9,483 (26.7) | 35,560 (100) |

B. PUBLIC TRANSPORTATION (Jeepney/Bus)

(Persons Unit)

| STATION \ DIRECTION 2) \ PURPOSE | | HOME | WORK | SCHOOL | BUSINESS | OTHERS | TOTAL |
|---|---|---|---|---|---|---|---|
| OD-1 (Parañaque) | A | 17,559 | 11,937 | 3,902 | 15,308 | 58,640 | 107,346 |
| | B | 38,755 | 7,811 | 1,150 | 8,786 | 25,629 | 82,131 |
| OD-2 (Zapote) | A | 21,926 | 10,648 | 3,574 | 9,992 | 49,073 | 95,213 |
| | B | 67,815 | 6,692 | 173 | 19,118 | 27,445 | 121,243 |
| OD-3 (Alabang) | A | 8,215 | 13,774 | 3,423 | 3,693 | 18,534 | 47,639 |
| | B | 24,283 | 7,520 | 169 | 3,390 | 11,105 | 46,467 |
| OD-4 (Sucat) | A | 9,152 | 16,014 | 822 | 4,646 | 12,706 | 43,340 |
| | B | 11,909 | 8,418 | 183 | 6,466 | 7,183 | 34,159 |
| TOTAL 1) | A | 56,852 (19.4) | 52,373 (17.8) | 11,721 (4.0) | 33,639 (11.5) | 138,953 (47.3) | 293,538 (100) |
| | B | 142,762 (50.3) | 30,441 (10.7) | 1,675 (0.6) | 37,760 (13.3) | 71,362 (25.1) | 284,000 (100) |
| | A + B | 199,614 (34.6) | 82,814 (14.3) | 13,396 (2.3) | 71,399 (12.4) | 210,315 (36.4) | 577,538 (100) |

Notes : 1) Percent share is shown in ( ).

2) Direction A towards Manila and the direction B from Manila

APPENDIX NOTE 4.1 TRIPS AND POPULATION

Statistical analysis was conducted on the relationship between the volume of trips generated and attracted, and the population and the employment. Data were studied and used for the analysis as follows:

To determine the traffic volume generated and attracted in each zone, the short distant trips within the zone, tii, was estimated to obtain the total trips since the 1981 O-D table in Appendix 14-1 did not include these intra-zonal trips. The intra-zonal trips, tii, and its percent share to the total trips Ti, generated and attracted in zone i, were obtained by the data of the 1980 O-D person Tables of MMETROPLAN. The above percent share in each zone was used to estimate the volume of intra-zonal vehicle trips in 1981, with which the total trips generated and attracted in each zone were determined.

Population and employment opportunity in each zone were estimated for 1980 and 1990 in Chapter 3. The figures of population and employment for 1981 were calculated by interpolating the figures in 1980 and 1990.

A typical relationship of small vehicle trips and population by zone is presented in Appendix Fig. 4.2-3 where zones in the DIZ and those in the Northern Area are shown in different scale. Appendix Fig. 4.2-4 illustrates another relationship between the truck trips and employed persons by workplace. Similar relationship was studied for the cases of buses and jeepneys. Regression analysis by the least square method was conducted to find the parameter and the degree of correlation. The regression model formulas tested using one or two independent variables are shown below.

$$T = a P_1 + k \quad \text{---} \quad (1), \qquad T = a P_2 + k \quad \text{---} \quad (2)$$

$$T = k P_1^{b} \quad \text{-----} \quad (3), \qquad T = k P_2^{a} \quad \text{----} \quad (4)$$

$$T = a P_1 + b P_2 + k \quad \text{---} \quad (5)$$

It was found that the formulas (1) and (2) had higher correlation coefficient (r) when zones 1-46 were used than the groups of the zones 1-33 and the zones 34-46. The formula (3) had a higher value of (r) when the zones were grouped into two: one with zones 1-33 and the other 34-46, than the all zones of 1-46. Also, the two groups had higher values of (r) under theformula (3) than the formula (1).

In the case of truck trips the employment opportunity was considered to be more closely associated than the population. Truck trips indicated a higher value of (r) under formula (4) for the zones 1-33 than the zones 34-46 and the all zones as well. In the case of two-variable regression as in the formula (5), the parameters were reasonable (not negative) and resulted in a high correlation coefficient for small vehicles, buses and jeepneys in the zones 1-33. But other groups had a negative parameter although they had a high value of (r). The parameters are shown in Appendix Table 4.2-10.

It is understood that the parameters indicate the following trip rates in the case of $T=aP_1 + b$, if other conditions are not changed.

| | |
|---|---|
| Small vehicles | 4 vehicle trips per 10 inhabitants |
| Buses | 0.2 vehicle trip per 10 inhabitants |
| Jeepneys | 1 vehicle trip per 10 inhabitants |

For the employment opportunities, the regression formula of $T = bP_2 + K$ indicates the following rate:

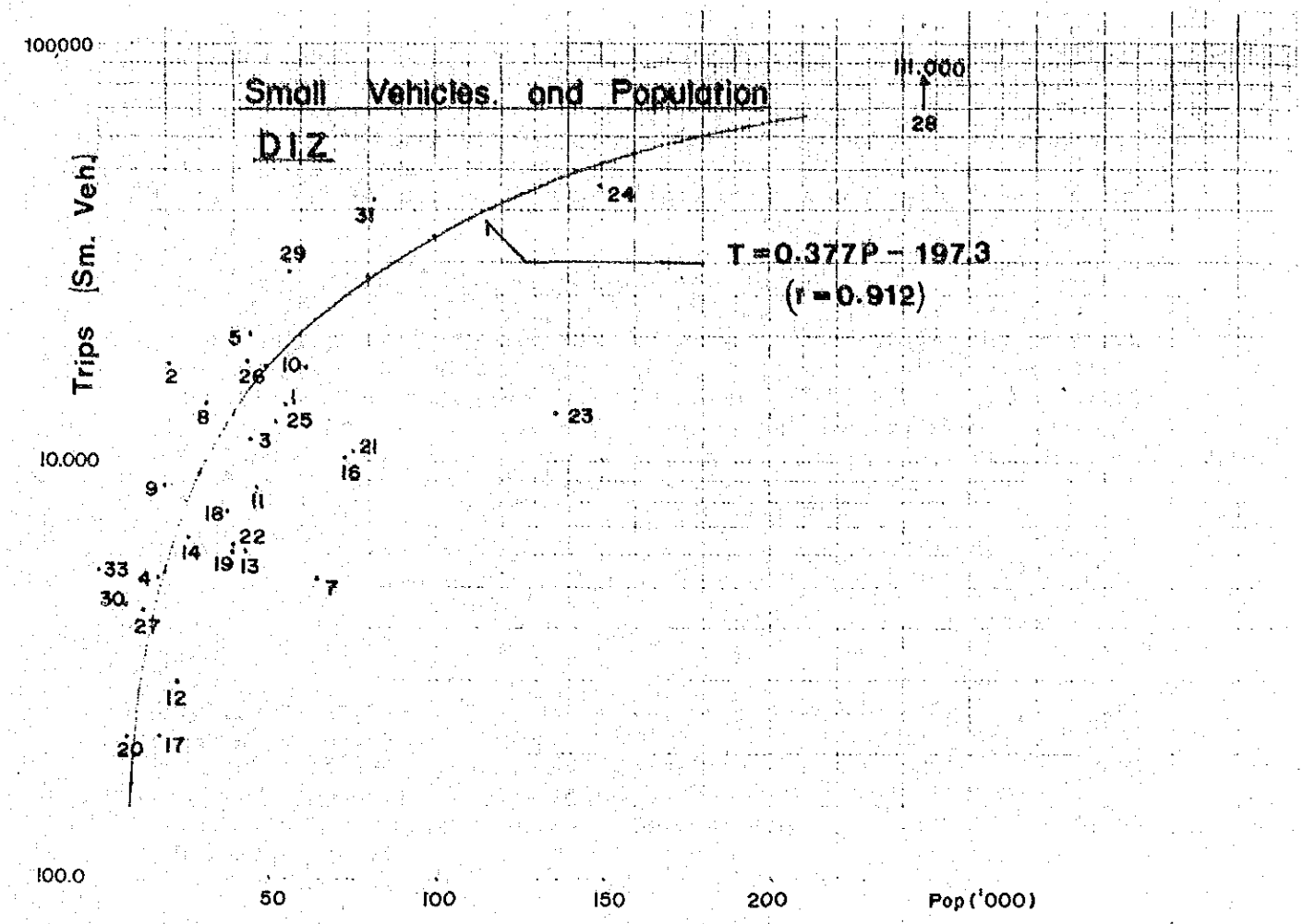
| | |
|---|---|
| Trucks | 8 vehicle trips per 10 workers. |

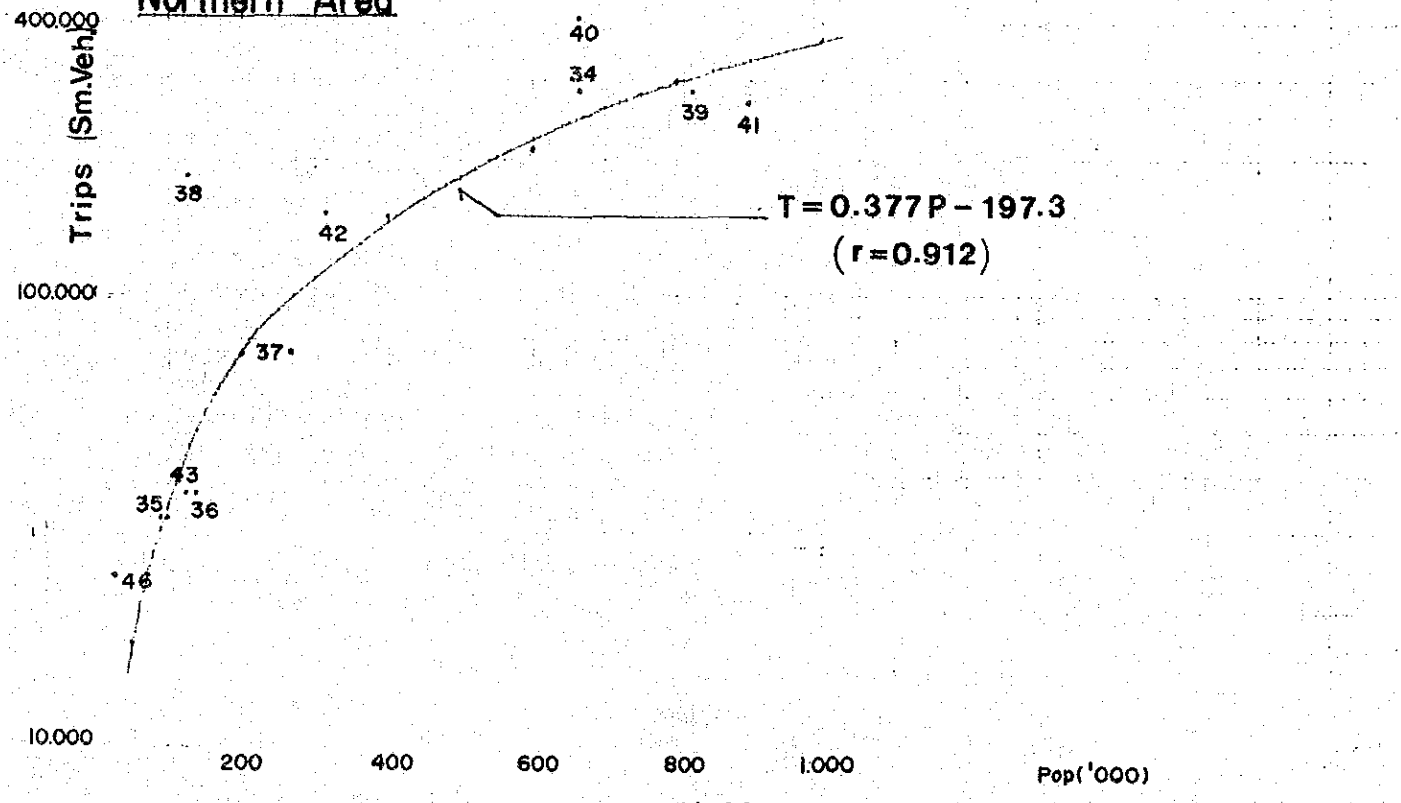
By using the two-variable regression, the following trip production rates were obtained. In these cases the same trip volume was explained by two variables resulting in a smaller respective rate than the cases of single variable ($P_1$) regression.

| | Every 10 Inhabitants | Every 10 Workers |
|---|---|---|
| Small vehicles | 1.0 | 8.0 |
| Buses | 0.1 | 0.6 |
| Jeepney | 0.3 | 3.0 |
| Trucks | negative | 1.0 |

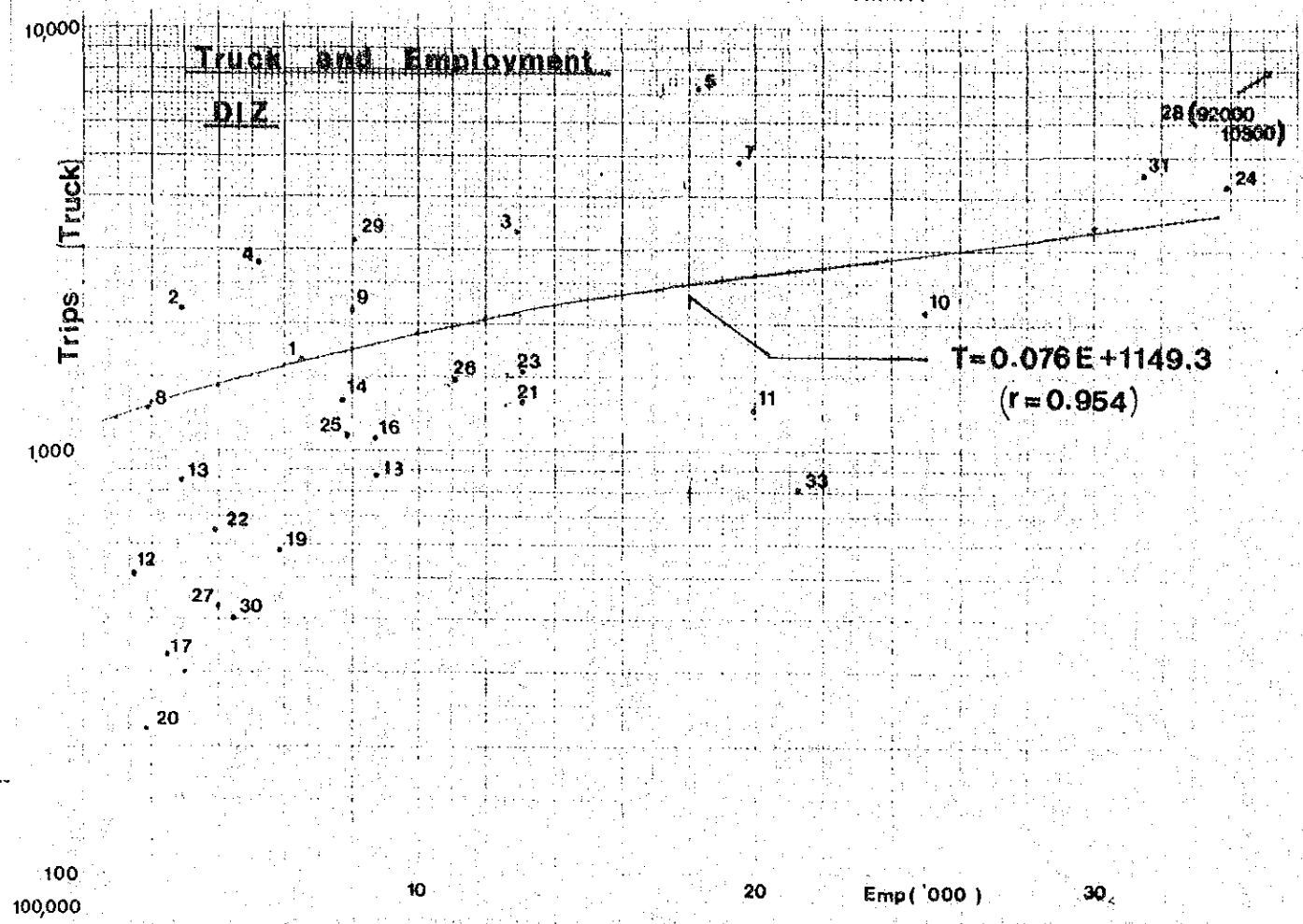
It is to be noted that the parameters indicate the trip production rates in 1981. It does not indicate the time sequential changes in the trip rate from 1981 to 1985 or from 1981 to 1990. Parameters for time sequential changes should incorporate in the changes in income, industrial composit, car ownership, etc., among other factors.

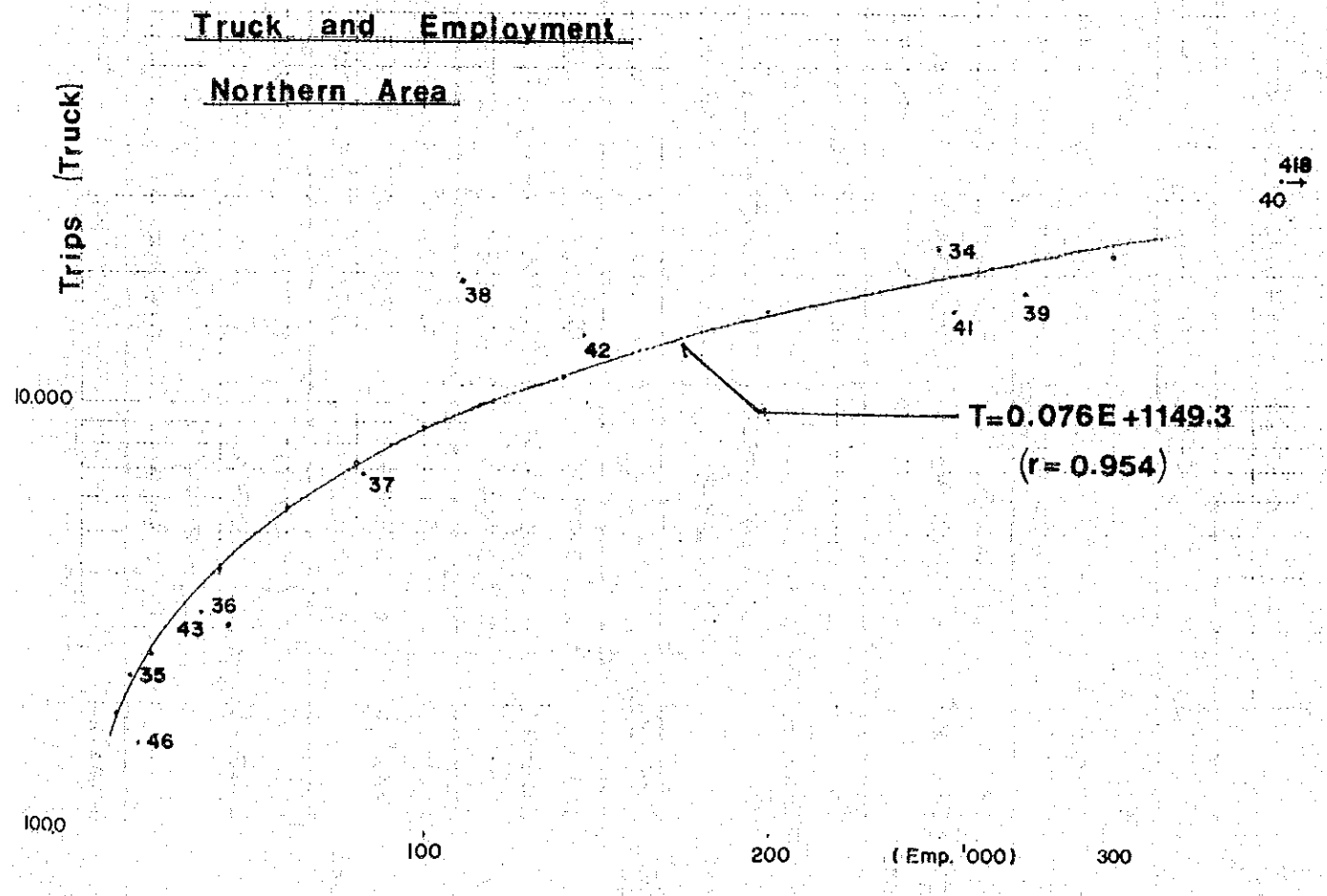
APPENDIX FIG. 4.2-3 TRIPS AND POPULATION



APPENDIX FIG. 4.2-4 TRIPS AND EMPLOYMENT



APPENDIX TABLE 4.2–10 REGRESSION ANALYSIS: PARAMETERS AND CORRELATION COEFFICIENT

| | Zone | | 1 - 33 | 34 - 46 | 1 - 46 |
|---|---|---|---|---|---|
| Small Vehicle | (1) $T=aP_1 + K$ | a | 0.34908 | 0.12717 | 0.37737 |
| | | k | -4694.26331 | 5383.41467 | -1972.50000 |
| | | (r) | 0.86419 | 0.42602 | 0.91154 |
| | (2) $T= K.P_1^a$ | a | 0.99329 | 2.37563 | 0.74204 |
| | | k | 0.20495 | 9.8934E-08 | 3.60820 |
| | | (r) | 0.86601 | 0.91503 | 0.70403 |
| | (5) $T=aP_1+bP_2+K$ | a | 0.10639 | 0.16840 | -0.01907 |
| | | b | 0.82434 | -0.12906 | 1.04052 |
| | | k | -1095.01904 | 5138.03247 | 3070.61865 |
| | | (r) | 0.93458 | 0.43752 | 0.98771 |

| | Zone | | 1 - 33 | 34 - 46 | 1 - 46 |
|---|---|---|---|---|---|
| Buses | (1) $T=aP_1+K$ | a | 0.02410 | 0.01063 | 0.02427 |
| | | k | -425.36931 | 132.63591 | -143.79019 |
| | | (r) | 0.88121 | 0.42983 | 0.91179 |
| | (2) $T=K.P_1a$ | a | 0.71455 | 1.56722 | 0.59550 |
| | | k | 0.22846 | 2.2545E-05 | 1.14969 |
| | | (r) | 0.82204 | 0.82763 | 0.69989 |
| | (5) $T=aP_1+bP_2+K$ | a | 0.00783 | -0.00264 | - 0.00076 |
| | | b | 0.05527 | 0.04154 | 0.06569 |
| | | k | -184.04816 | 211.60883 | 174.57315 |
| | | (r) | 0.94904 | 0.57849 | 0.98528 |

| | Zone | | 1 - 33 | 34 - 46 | 1 - 46 |
|---|---|---|---|---|---|
| Jeepney | (1) $T=aP_1 + K$ | a | 0.10301 | 0.08359 | 0.11358 |
| | | k | -1320.86182 | -488.05594 | -487.72046 |
| | | (r) | 0.84926 | 0.49771 | 0.90614 |
| | (2) $T=K.P_1^a$ | a | 0.87246 | 2.03155 | 0.68626 |
| | | k | 0.21037 | 8.4144E-07 | 1.99126 |
| | | (r) | 0.85226 | 0.90354 | 0.71149 |
| | (5) $T=aP_1+bP_2+K$ | a | 0.02653 | -0.02535 | -0.00760 |
| | | b | 0.25978 | 0.34107 | 0.31805 |
| | | k | -186.61768 | 160.41339 | 1053.77063 |
| | | (r) | 0.92773 | 0.68325 | 0.98413 |

| | Zone | | 1 33 | 34 46 | 1 46 |
|---|---|---|---|---|---|
| Trucks | (2) $T=bP_2+K$ | b | 0.10711 | 0.10700 | 0.07563 |
| | | k | 783.0574 | 1461.16240 | 1149.31631 |
| | | (r) | 0.83448 | 0.46898 | 0.95365 |
| | (4) $T=K.P_2^b$ | b | 0.91305 | 1.48755 | 0.89209 |
| | | k | 0.38499 | 2.5045E-03 | 0.35343 |
| | | (r) | 0.87184 | 0.8185 | 0.82436 |
| | (5) $T=aP_1+bP_2+K$ | a | -0.00219 | 0.00138 | -0.01150 |
| | | b | 0.11261 | 0.10417 | 0.10169 |
| | | k | 837.14339 | 1436.57243 | 1483.90244 |
| | | (r) | 0.83486 | 0.46907 | 0.96255 |

**Remarks:** a and b are the parameters of the variable, $P_1$ and $P_2$ and K is the constant resulted from the regression. (r) is the correlation coefficient. $P_1$ is population and $P_2$ is employment opportunity.

## APPENDIX NOTE 4.2 TRIP LENGTH DISTRIBUTION

Trip lengths of vehicles were studied from the data of the origin-destination interview survey. The data were grouped into two: one in the corridor along the coast of Manila Bay (Interview stations 1 and 2) and the other along the coast of Laguna Lake (Interview stations 3 and 4). Trip lengths in kilometers were classified into 13 categories marked off by every 5 kilometers.

The result is shown in Appendix Fig. 4.2-5 from which the following points were noticed:-

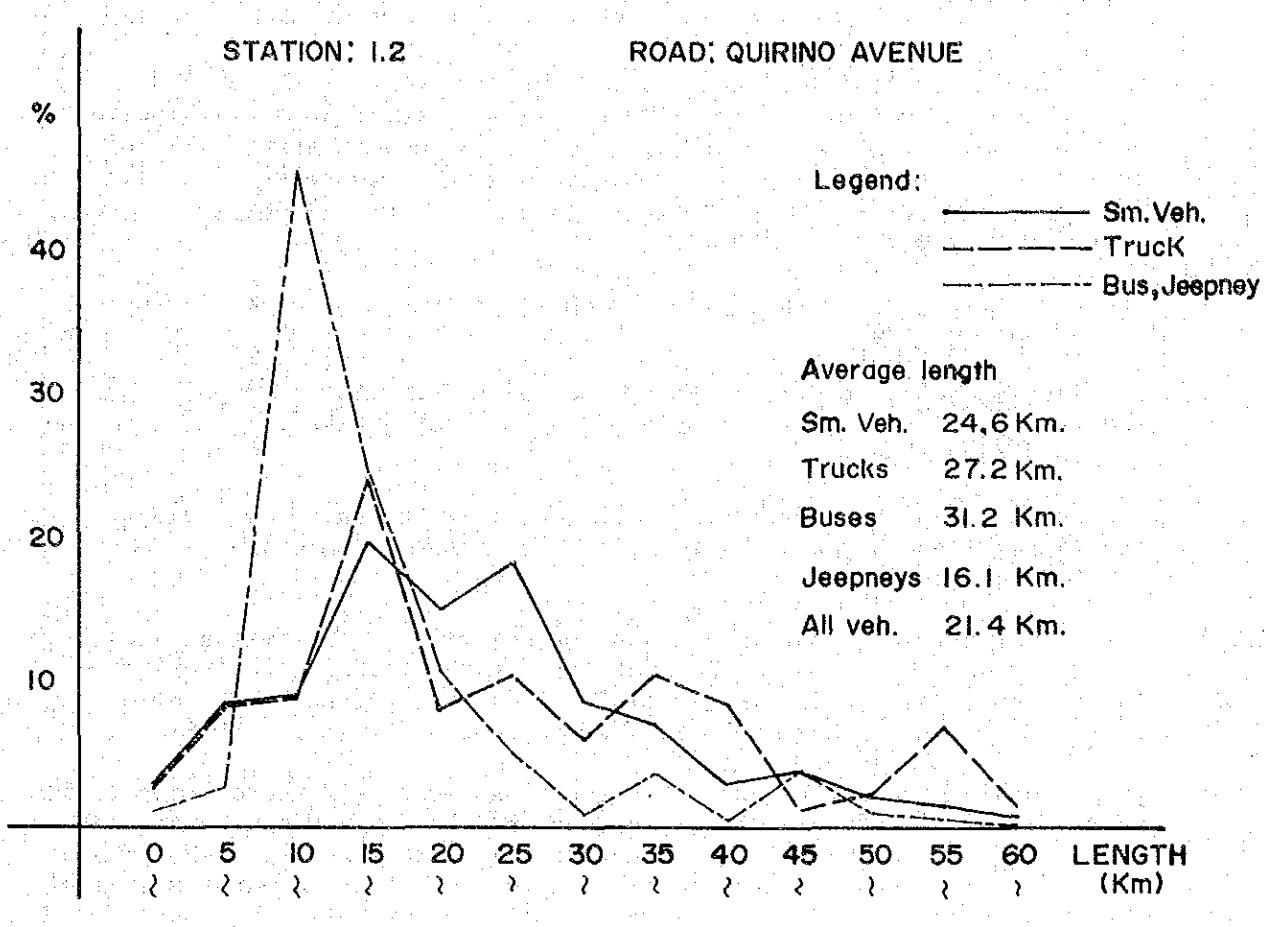
Small vehicles had a similar pattern of trip distribution on both groups. The average length was 22 Km on the side of Laguna Lake and 25 Km on the side of Manila Bay.

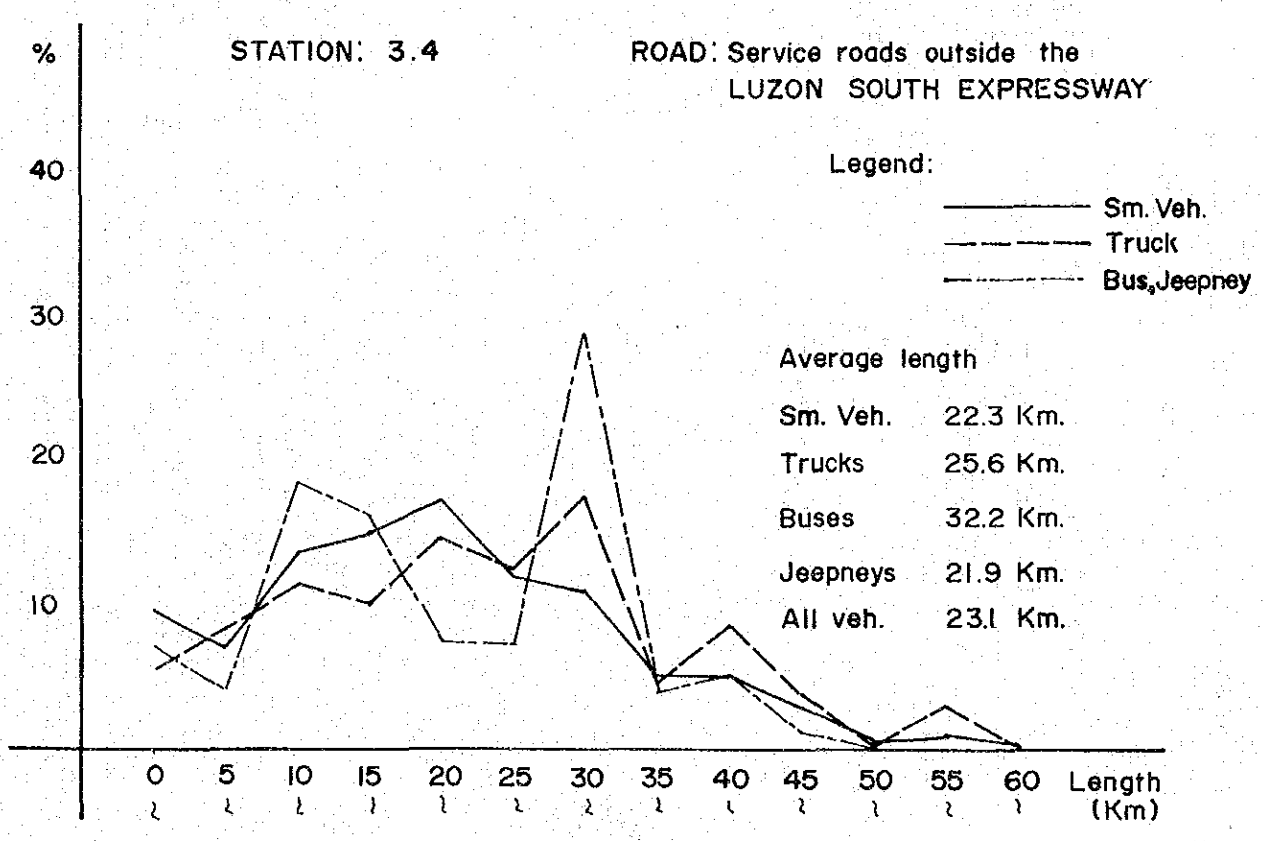
Trucks had also the same pattern of trip distribution on both sides. The average length was 26 Km for the side of Laguna Lake and 27 Km for the side of Manila Bay.

The difference was found in bus and jeepney trips. The average length was 23 Km in the former group and 19 Km for the latter. If divided into buses and jeepneys, the difference was larger for jeepneys (22 Km vs. 16 Km), while buses had the same average length (32 Km vs. 31 Km).

It is to be noted that these classifications were only those interviewed in May 1981. Traffic on the expressway and the Project Roads were not included. If they were included the trip length of buses, jeepneys and trucks would have been substantially larger for those moving the side of Laguna Lake.

APPENDIX FIG. 4.2-5 TRIP LENGTH DISTRIBUTION



## APPENDIX NOTE 4.3 TRAFFIC VOLUME AND ROAD CAPACITY IN 1981

The counted traffic volume in Appendix Table 4.2-4 was used to determine the peak hour volume for the selected road sections. From these data the peak hour ratio in the traffic volume for each road section was obtained and shown as the peak factor in Appendix Table 4.2-11. The existing hourly capacity and daily capacity were estimated using the factors shown in the same table. The peak hour volume in 1981 for the selected sections and the respective hourly capacity are shown in Appendix Fig. 4.2-6.

It was found that the peak hour volume was 8,600 vehicles while the hourly capacity was 12,800 vehicles on the screen AA. It indicated that the total roads serving the north-south traffic had sufficient capacity in 1981. However, the situation differed when the east and the west corrdors were studied independently.

In the west corridor, both roads of Qurino Avenue and Imelda Avenue have served excessive hourly traffic volume more than their hourly capacity, while in the east corridor the peak hour traffic volume of 5,000 vehicles was considerably less than the capacity of the roads, 10,400 vehicles per hour, including South Luzon Expressway.

It was found that the roads in the west corrdor had almost always been congested, resulting often stopping and queing; while the roads in the eastern corridor had served more traffic with higher running speed and less congestion.

In the cordon screen of BB the peak hour traffic was yet reaching its hourly capacity, while in the screen B'B' the traffic exceeded the capacity. The screen B'B' was located 1 Km. inside from the South Luzon Expressway. When the whole section is taken into account, it can be said that the traffic is now at the design capacity of the Project Roads of both A and B.

APPENDIX TABLE 4.2-11 ESTIMATED TRAFFIC CAPACITY OF THE EXISTING ROADS

| Items \ Name of Road & Survey Station | QUIRINO AVENUE A1 | IMELDA AVENUE A2(IS-1) | SERVICE RD (WEST SIDE) A3 | SERVICE RD (EAST SIDE) A4 | SOUTH SUPER HIGHWAY A6 | ROUTE-303 A5 | PARANAQUE: SUCAT RD B1 | ZAPOTE ALABANG RD B2 |
|---|---|---|---|---|---|---|---|---|
| Number of Lane | 2 | 2 | 2 | 2 | 4 | 2 | 2 | 2 |
| Peak Factor (%) 1) | 8.8 | 10.8 | 9.0 | 9.8 | 10.0 | 8.9 | 10.1 | 11.4 |
| % of Heavy Vehicles | 7.6 | 4.7 | 15.0 | 11.6 | 13.0 | 5.2 | 8.3 | 10.0 |
| Basic Capacity(P.C.U./hr: CB | 2500 | 2500 | 2500 | 2500 | 2500 | 2500 | 2500 | 2500 |
| Coefficient of Adjustment: Lane Width YL | 0.85 | 0.85 | 0.77 | 0.77 | 1.00 | 0.77 | 0.94 | 0.94 |
| Coefficient of Adjustment: Lateral Clearance YC | 0.86 | 0.75 | 0.70 | 0.70 | 1.00 | 0.70 | 0.96 | 0.96 |
| Coefficient of Adjustment: Heavy Vehicle YT | 0.92 | 0.95 | 0.86 | 0.90 | 0.85 | 0.95 | 0.90 | 0.90 |
| Coefficient of Adjustment: Condition of Sight YI | 0.70 | 0.80 | 0.70 | 0.70 | 1.0 | 0.7 | 0.7 | 0.7 |
| Coefficient of Adjustment: Total Y | 0.471 | 0.485 | 0.324 | 0.340 | 0.93 | 0.358 | 0.569 | 0.569 |
| Possible Capacity(Veh/hr) C | 1,178 | 1,213 | 810 | 850 | 2,112 | 896 | 1421 | 1421 |
| Design Level (Adjustment) V/C | 1.0 | 1.0 | 1.0 | 1.0 | 0.9 | 1.0 | 1.0 | 1.0 |
| Design Capacity(Veh/hr)CD 2) | 1.178 | 1.213 | 810 | 850 | 2,093 | 896 | 1,421 | 1,421 |
| Peak Factor (%) K | 8.8 | 10.8 | 9.0 | 9.8 | 10.0 | 8.9 | 10.1 | 11.4 |
| Rate of Direction (%) D | - | - | - | - | 60 | - | - | - |
| (Veh/day) 3) Daily Capacity | 13,400 | 11,200 | 9,000 | 8,700 | 18,000 x 4 = 72,000 | 10,000 | 14,000 | 12,500 |

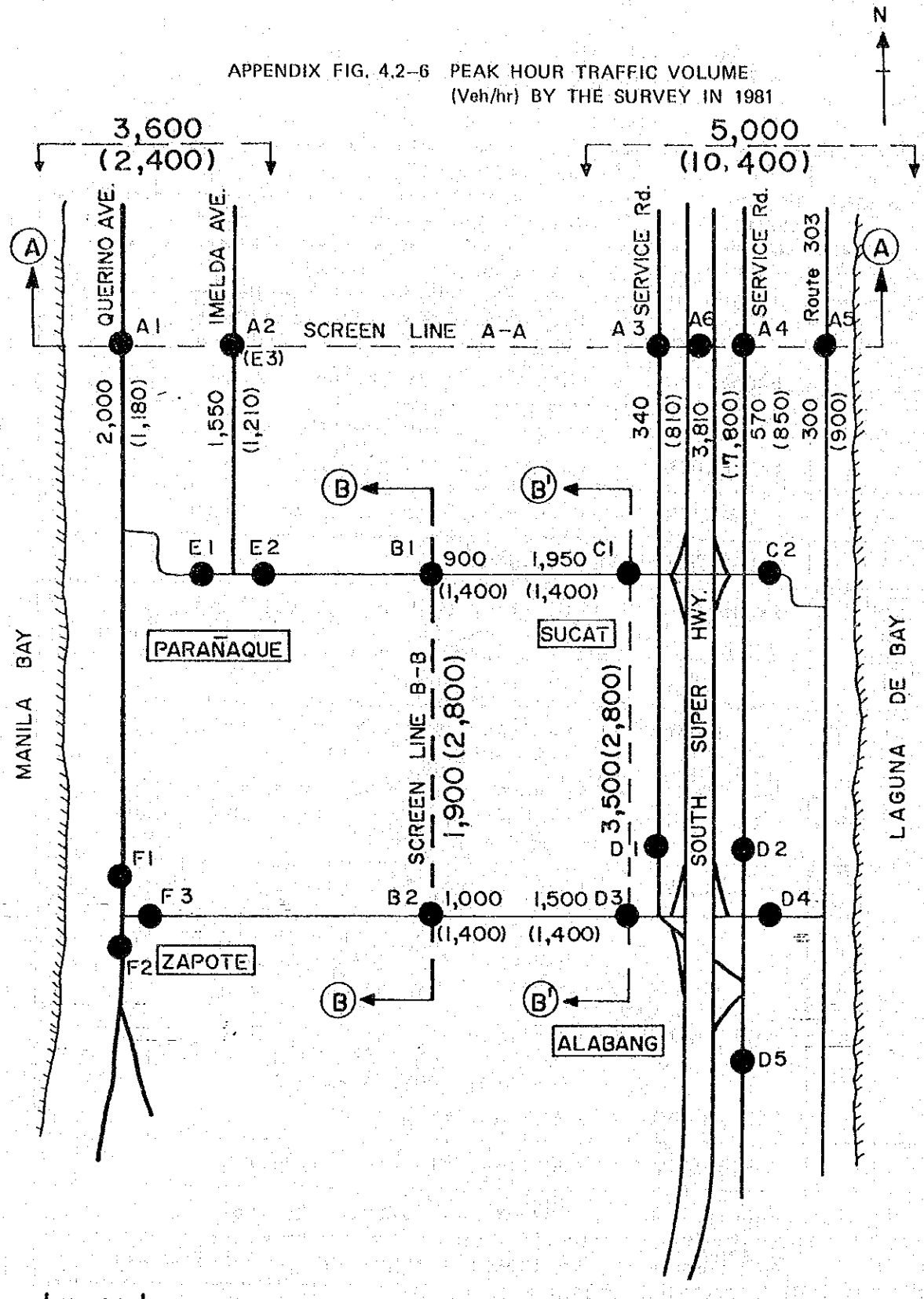
Notes: 1) Peak factor in percent is tabulated by using the traffic volume of 16 hours. The average factor is 9.9%. (If the volume of 24 hours is used, the average peak hour factor will be 7.7%).

2) Design Capacity (CD) = CB x YL x YC x YT x YI

3) Daily Capacity ( Multiple Lanes ) = $\frac{5000 \times CD}{K \times D}$ , Daily capacity (2 Lanes) = $\frac{100}{K} \times CD$

Source: Highway Capacity Manual 1965 ( Bureau of Public Roads, USA) and Japan Road Design Standard ( Japan Roads Association, 1970 ).

APPENDIX FIG. 4.2-6 PEAK HOUR TRAFFIC VOLUME
(Veh/hr) BY THE SURVEY IN 1981




Legend:

3,600 : Peack Hour Traffic Through the Traffic Counting in MAY 1981 by the Study Group

● : SURVEY STATION

(2,400) : ESTIMATED TRAFFIC CAPACITY (Veh/hr)

APPENDIX TABLE 4.3-1 ZONE TABLE

(1 of 4)

| Zone No. | Description |
|---|---|
| | MUNICIPALITY - (Name of Barangay) |
| Direct Influence Zone (33 Zones) | |
| 1 | TAGUIG - (Lower Bicutan, Maharlika Village, Signal Village, Upper Bicutan)<br>PARAÑAQUE - (San Martin de Porres) |
| 2 | TAGUIG - (Bagong Tanyag, Bagumbayan)<br>PARAÑAQUE - (Marcelo Green Village) |
| 3 | PARAÑAQUE - (Don Bosco, Merville, Sun Valley) |
| 4 | PARAÑAQUE - (Moonwalk) |
| 5 | PARAÑAQUE - (Vitales, La Huerta, Sto. Niño, San Dionisio) |
| 6 | Reclaimed Land |
| 7 | PARAÑAQUE - (San Dionisio; Gatchalian Subd./ Villanueva Village)<br>LAS PIÑAS - (Manuyo, Manuyo Dos, Danilo Fajardo, E. Aldana, Ilaya, Pulanglupa, Zapote, Pulanglupa Dos) |
| 8 | PARAÑAQUE - (San Isidro, B.F. Homes; B.F. Homes Executive/B.F. Homes Phase II/III, San Antonio; San Antonio Valley I & II/ Barangay Village/Better Living/4th Estate Subd.) |
| 9 | PARAÑAQUE - (B.F. Homes: B.F. Homes Phase I/ Teoville Subd./St. Rita Subd., San Antonio; Moon-El Subd.)<br>MUNTINLUPA - (Buli,Sucat) |
| 10 | MUNTINLUPA - (Bayanan, Alabang, Cupang) |
| 11 | MUNTINLUPA - (Tunasan,Poblacion, Pototan) |
| 12 | LAS PIÑAS - (Almanza, Almanza Dos, Pilar Village) |
| 13 | LAS PIÑAS - (B.F. Int. Village, Talon, Talon Tres, Talon Cuatro, Talon Singko) |
| 14 | LAS PIÑAS - (Pamplona, Pamplona Dos, Pamplona Tres, Talon Dos) |
| 15 | Reclaimed Land |

APPENDIX TABLE 4.3-1 ZONE TABLE

(2 of 4)

| Zone No. | Description |
|---|---|
| | MUNICIPALITY - (Name of Barangay) |
| 16 | BACOOR - (Aliwa, Aniban, Bonalo, Daang Bukid, Digman, Dulong Bayan, Habay, Kaingin, Ligas, Mabolo, Maliksi, Niyog, Pedro Espiritu, Real, Salinas, Sineguilasan, Tabing Dagat, Talaba, Zapote) |
| 17 | BACOOR - (Bayanan, Mambog, Molino, San Nicolas) |
| 18 | KAWIT - All Area |
| 19 | IMUS - (Barangay 1-4, Bayan Luma, Palico, Pag-asa, Alapan I, Bukandala, Calsadang Bago, Medicion 1 & 2, Toclong 1 & 2, Tanzang Luma) |
| 20 | IMUS - (Anabu I & II, Pasong Buaya) |
| 21 | SAN PEDRO - (All Area) |
| 22 | GEN. TRIAS - (Bacao, Tejero, San Juan, Sta. Clara, Navarro, Pinagtipunan, Tapia, Pasong Kamachile, Santiago, Pasong Kawayan I & II) |
| 23 | CAVITE CITY/NOVELETA/ROSARIO - (All Area) |
| 24 | BIÑAN/CARMONA - (All Area) |
| 25 | DASMARIÑAS - (All Area) |
| 26 | TANZA - (All Area) |
| 27 | GEN. TRIAS - (Buenavista, San Francisco, Manggahan, Biclatan, Javatera, Panungyanan, Alingaro) |
| 28 | PASAY CITY - (San Isidro, Sta. Clara, San Roque, San Rafael, Malibay)<br>: Pasay New Zone 1 - 18 |
| 29 | TAGUIG - (Bambang, Calzada, Ibayo-Tipas, Ligid-Tipas, Napindan, Palingon, Sta. Anan, Tuktukan, Ususan, Wawa) |
| 30 | TAGUIG - (Western Bicutan, Fort Bonifacio) |
| 31 | PASAY - (Manila International Airport Area)<br>: Pasay New Zone 19 - 20<br>PARAÑAQUE - (Baclaran, Tambo, Dongalo) |

APPENDIX TABLE 4.3-1 ZONE TABLE

(3 of 4)

| Zone No. | Description |
|---|---|
| | MUNICIPALITY - (Name of Barangay) |
| 32 | Reclaimed Land |
| 33 | Reclaimed Land |
| External Zone (16 Zones) | |
| 134 | Bounded on the north of Manila, the west by the boundary of the Municipality of MAKATI, on the east by the boundary of Fort Bonifacio and on the South by Epifanio de los Santos Avenue (C-4) |
| 135 | Bounded on the north and east by Pasig River, on the south by the boundary of Fort Bonifacio and on the west by EDSA (C-4). |
| 136 | Municipality of TAYTAY |
| 137 | Bounded on the west by Marikina River, on the east by the boundary of the Municipality of TAYTAY, on the north by the boundary of the Municipality of MARIKINA and on the south by Pasig River. |
| 138 | Bounded on the west by Epifanio de los Santos Avenue (C-4) and on the east by Marikina River, on the north by Aurora Boulevard and on the south by the boundary of the Pasig City. |
| 139 | Bounded on the east by Epifanio de los Santos Avenue (C-4), on the west and south by Pasig River and on the north by Quezon Avenue (R-7). |
| 140 | The Area surrounded by C-2 Route (C.B.D.) |
| 141 | Bounded on the north by Epifanio de los Santos Avenue (C-4), on the south by Quezon Avenue (R-7) and on the west of Caloocan city. |
| 142 | Bounded on the east by Marikina River, on the west by Epifanio de los Santos Avenue (C-4), on the north by the proposed Republic Avenue and on the south by Aurora Boulevard. |
| 143 | Bounded on the west by Marikina River and on the north, east and south by the boundary of the Municipality of MARIKINA. |

APPENDIX TABLE 4.3-1 ZONE TABLE

(4 of 4)

| Zone No. | Description |
|---|---|
| | MUNICIPALITY - (Name of Barangay) |
| 144 | Bounded on the north and east by the boundary of the Cities of QUEZON CITY and CALOOCAN and on the south by proposed Republic Avenue. |
| 145 | Bounded on the north by the boundary of the Municipality of MEYCAUAYAN, on the south by Epifanio de los Santos Avenue (C-4). |
| 146 | Bounded on the north by Epifanio de los Santos Avenue (C-4) and on the south and west by the boundary of the Municipality of MAKATI. |
| 247 | Municipalities of SANTA ROSA/CABUYAO/CALAMBA/LOS BAÑOS |
| 248 | Municipalities of SILANG/AMADEO/TAGAYTAY CITY |
| 249 | Municipalities of NAIC/INDANG/MENDEZ NUÑEZ/ALFONSO/ MARAGONDON/GEN. AGUINALDO BAILEN/MAGALLANES |

## APPENDIX TABLE 4.3–2 OD INTERVIEW FIELD FORM–(A) (ALL VEHICLE TYPES)

SHEET No.: _____

STA. NO : _____ DATE & DAY : MAY '81 (  ) WEATHER : _____

DIRECTION: FROM _____ TO _____ INTERVIEWER : _____

1. IDENTIFICATION CODE _____ (1–6)
2. INTERVIEW HOUR _____ O'CLOCK (7–12)

| | | | |
|---|---|---|---|
| 3. | VEHICLE | 1. JEEPNEY<br>2. CAR/JEEP/TAXI<br>3. VAN/PICK-UP<br>4. MINI BUS<br>5. BIG BUS<br>6. TRUCK MEDIUM<br>7. TRUCK LARGE<br>8. OTHERS (MOTORCYCLE/TRICYCLE)<br>YEAR OF MANUFACTURE | 13–15 |
| 4. | HOME ADDRESS | ST. & ST./BARRIO _____<br>CITY/MUN./PROVINCE | 16–18 |
| 5. | ORIGIN | ST. & ST./BARRIO _____<br>CITY/MUN./PROVINCE _____<br>OR.<br>NAME OF POPULAR FACILITY (  ) | 19–21 |
| 6. | DESTINATION | ST. & ST./BARRIO _____<br>CITY/MUN./PROVINCE _____<br>OR.<br>NAME OF POPULAR FACILITY (  ) | 22–24 |
| 7. | PURPOSE OF TRIP | 1. HOME<br>2. WORK<br>3. SCHOOL<br>4. BUSINESS<br>5. SHOPPING<br>6. RECREATION<br>7. OTHERS | 25 |
| 8. | NUMBER OF PASSENGERS | (INCLUDING DRIVER) ☐ PASSENGERS | 26–27 |
| 9. | SEAT CAPACITY | (ONLY FOR JEEPNEY, MINI BUS, BIG BUS) ☐ SEATS | 28–29 |

## APPENDIX TABLE 4.3–3 OD INTERVIEW FIELD FORM–(B) (PUBLIC TRANSPORT PASSENGERS)

SHEET No: _____

STA. NO _____ DATE & DAY: MAY '81 (  ) WEATHER: _____

DIRECTION: FROM _____ TO _____ INTERVIEWER: _____

1. IDENTIFICATION CODE _____ (1–6)
2. INTERVIEW HOUR _____ O'CLOCK (7–12)

| | | | |
|---|---|---|---|
| 3. | VEHICLE | 1. JEEPNEY<br>4. MINI BUS<br>5. BIG BUS | 13 |
| 4. | HOME ADDRESS | ST. & ST./BARRIO _____<br>CITY/MUN./PROVINCE _____ | 14–16 |
| 5. | ORIGIN | ST. & ST./BARRIO _____<br>CITY/MUN./PROVINCE _____<br>OR.<br>NAME OF POPULAR FACILITY (  ) | 17–19 |
| 6. | DESTINATION | ST. & ST./BARRIO _____<br>CITY/MUN./PROVINCE _____<br>OR.<br>NAME OF POPULAR FACILITY (  ) | 20–22 |
| 7. | PURPOSE OF TRIP | 1. HOME<br>2 WORK<br>3. SCHOOL<br>4. BUSINESS<br>5. SHOPPING<br>6. RECREATION<br>7. OTHERS | 23 |

APPENDIX TABLE 4.3-4 SAMPLING RATE OF OD INTERVIEW

| | Station / Direction 1) / Description | OD-1 (Parañaque) | | OD-2 (Zapote) | | OD-3 (Alabang) | | OD-4 (Sucat) | | Total 5) | | TOTAL (I & II) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | A | B | A | B | A | B | A | B | A | B | |
| Form A 3) | Sampled Number of Vehicles | 599 | 434 | 1,218 | 464 | 488 | 665 | 661 | 505 | 2,966 | 2,068 | 5,034 |
| | Traffic Volume 2) | 10,858 | 8,016 | 8,588 | 10,745 | 5,089 | 7,059 | 5,751 | 5,143 | 30,286 | 30,963 | 61,249 |
| | Sampling Rate (%) | 5.5 | 5.4 | 14.2 | 4.3 | 9.6 | 10.6 | 11.5 | 9.8 | 9.8 | 6.7 | 8.2 |
| Form B 4) | Sampled Number of Passengers | 818 | 922 | 874 | 446 | 838 | 825 | 1,056 | 970 | 3,586 | 3,163 | 6,749 |
| | Number of Passengers | 67,858 | 54,022 | 55,758 | 67,636 | 28,970 | 24,989 | 21,781 | 8,177 | 174,367 | 154,824 | 329,191 |
| | Sampling Rate (%) | 1.2 | 1.7 | 1.6 | 0.7 | 2.9 | 3.3 | 4.8 | 11.9 | 2.1 | 2.0 | 2.1 |

NOTE:
1) Direction A towards Manila and Direction B from Manila
2) Traffic Volume is shown for 12 hours from 6:00 A.M. to 6:00 P.M.
3) In number of vehicles
4) In number of persons
5) The survey was on May 20, 1981 (Wednesday) on Station 1 and 4 and May 21, 1981 (Thursday) on Station 2 and 3.

APPENDIX TABLE 4.3-5 WEEKLY VARIATION OF TRAFFIC

| Station | Date | Weekday | TR 24 HR | Ratio/AV. | |
|---|---|---|---|---|---|
| South | April 19 '81 | Sun | 38357 | 0.800 | |
| Expressway | 20 | Mon | 51358 | 1.071 | |
| NicholsGate | 21 | Tue | 51940 | 1.083 | 1/1.083 = 0.923 |
| | 22 | Wed | 51186 | 1.068 | 1/1.068 = 0.936 |
| | 23 | Thu | 48408 | 1.009 | |
| | 24 | Fri | 49436 | 1.031 | |
| | 25 | Sat | 44893 | 0.936 | |
| | Total | - | 335618 | - | |
| | Average | | 47945 | 1.000 | |
| KB 94 | Nov. 20 '80 | Thu | 11210 | 1.056 | |
| (1618) | 21 | Fri | 10584 | 0.997 | |
| Km 24.9 | 22 | Sat | 10436 | 0.983 | |
| Cavite Pro. | 23 | Sun | 11521 | 1.085 | |
| | 24 | Mon | 10128 | 0.954 | |
| Manila- | 25 | Tue | 9613 | 0.905 | 1/0.905 = 1.105 |
| Cavite | 26 | Wed | 10841 | 1.021 | 1/1.021 = 0.979 |
| | Total | - | 74333 | - | |
| | Average | | 10619 | 1.000 | |
| St 2400 | Dec. 8 '80 | Mon | 7621 | 1.046 | |
| K 47.00 | 9 | Tue | 7319 | 1.005 | 1/1.005 = 0.995 |
| Laguna Pro. | 10 | Wed | 7603 | 1.044 | |
| | 11 | Thu | 7337 | 1.007 | 1/1.007 = 0.993 |
| Calamba | 12 | Fri | 7437 | 1.021 | |
| Cabuyao | 13 | Sat | 7177 | 0.985 | |
| | 14 | Sun | 6485 | 0.890 | |
| | Total | - | 50997 | - | |
| | Average | | 7283 | 1.000 | |

Source: Same as shown in APPENDIX TABLES 4.2-7 and 4.3-8

APPENDIX TABLE 4.3–6 ROADSIDE O–D INTERVIEWING: FACTORS OF EXPANSION TO DAILY TRAFFIC (12 HOURS TO 24 HOURS)

| | | Hours | | VEHICLE TYPES | | | | Total |
|---|---|---|---|---|---|---|---|---|
| | | | | Cars | Trucks | Jeepneys | Buses | |
| O-D 1A | To Manila | 12 HS | COUNTED | 5113 | 326 | 4715 | 704 | 10858 |
| | | 24 HS | " | 6491 | 455 | 6909 | 901 | 14756 |
| | | E F | | 1.270 | 1.396 | 1.465 | 1.280 | - |
| O-D 1B | From Manila | 12 HS | " | 3166 | 202 | 4044 | 604 | 8016 |
| | | 24 HS | " | 5251 | 265 | 6234 | 870 | 12620 |
| | | E F | | 1.659 | 1.312 | 1.542 | 1.440 | - |
| O-D 4A | To Manila | 12 HS | " | 2204 | 497 | 2659 | 391 | 5751 |
| | | 24 HS | " | 2722 | 742 | 3846 | 585 | 7895 |
| | | E F | | 1.235 | 1.493 | 1.446 | 1.496 | - |
| O-D 4B | From Manila | 12 HS | " | 1911 | 514 | 2492 | 226 | 5143 |
| | | 24 HS | " | 3387 | 757 | 4083 | 452 | 8679 |
| | | E F | | 1.772 | 1.473 | 1.638 | 2.000 | - |
| O-D 2A | To Manila | 12 HS | " | 3580 | 363 | 3744 | 901 | 8588 |
| | | 24 HS | " | 5768 | 493 | 5470 | 1401 | 13132 |
| | | E F | | 1.611 | 1.358 | 1.461 | 1.555 | - |
| O-D 2B | From Manila | 12 HS | " | 4725 | 343 | 4394 | 1283 | 10745 |
| | | 24 HS | " | 6452 | 476 | 6410 | 1828 | 15166 |
| | | E F | | 1.366 | 1.388 | 1.459 | 1.425 | - |

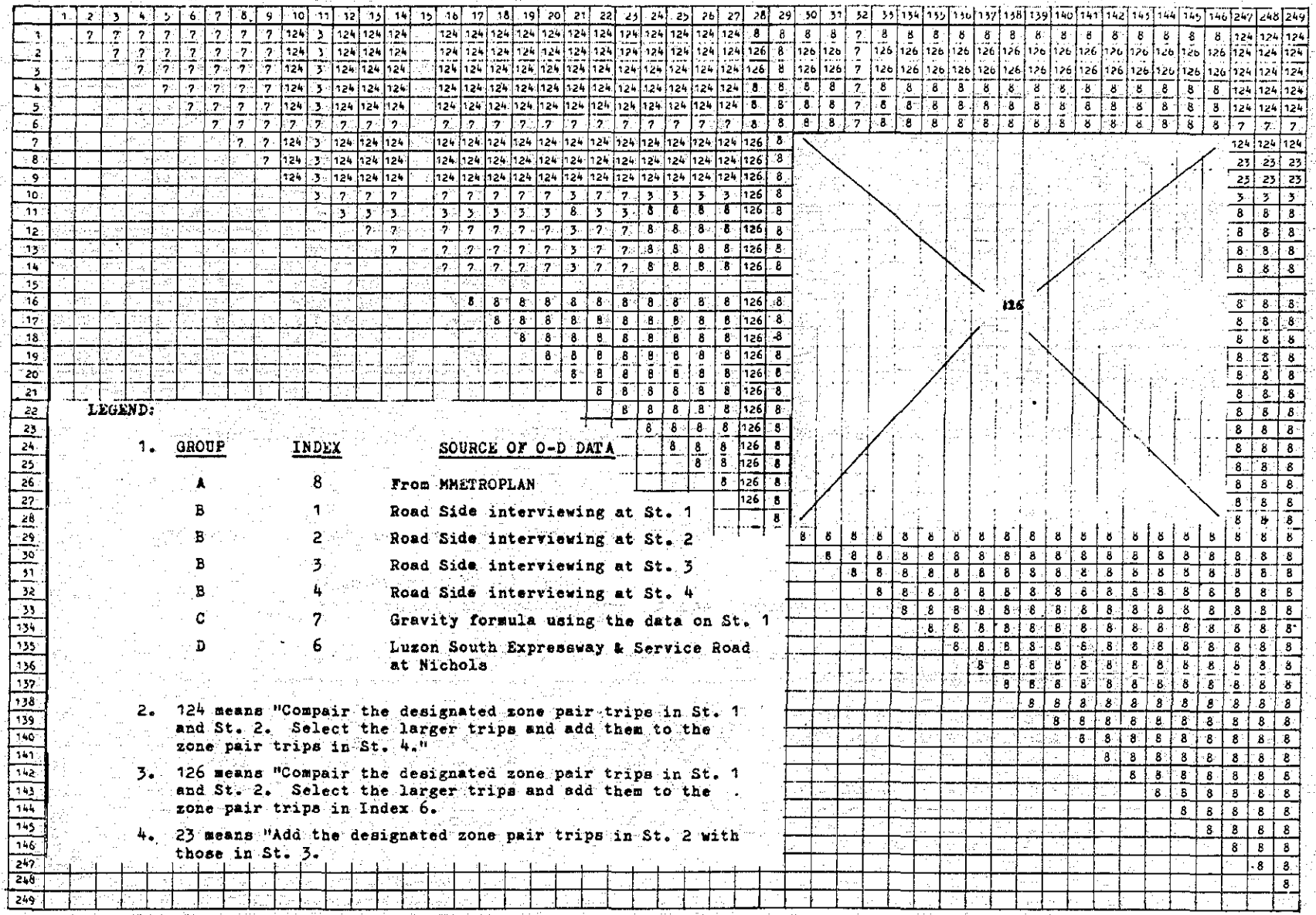
| | | Hours | | VEHICLE TYPES | | | | Total |
|---|---|---|---|---|---|---|---|---|
| | | | | Cars | Trucks | Jeepneys | Buses | |
| O-D 3A | To Manila | 12 HS | COUNTED | 1716 | 658 | 2391 | 324 | 5089 |
| | | 24 HS | " | 2707 | 990 | 4032 | 585 | 8314 |
| | | E F | | 1.578 | 1.505 | 1.686 | 1.806 | - |
| O-D 3B | From Manila | 12 HS | " | 3094 | 932 | 2573 | 460 | 7059 |
| | | 24 HS | " | 4292 | 1248 | 4364 | 675 | 10579 |
| | | E F | | 1.387 | 1.339 | 1.696 | 1.467 | - |

## ADT AND AADT ADJUSTMENT FACTORS

| ROADSIDE INTERVIEW | | ADT | AADT |
|---|---|---|---|
| O-D TABLES | LOCATION NO. 1 & 2 | 0.979 | 0.961 |
| | 3 & 4 | 0.993 | 1.000 |

Source: From APPENDIX TABLES 4.2-7, 4.3-4 and 4.3-5

## APPENDIX TABLE 4.3–7 SOURCES OF OD DATA AND ZONE PAIRS



**LEGEND:**

1. 

| GROUP | INDEX | SOURCE OF O-D DATA |
|---|---|---|
| A | 8 | From MMETROPLAN |
| B | 1 | Road Side interviewing at St. 1 |
| B | 2 | Road Side interviewing at St. 2 |
| B | 3 | Road Side interviewing at St. 3 |
| B | 4 | Road Side interviewing at St. 4 |
| C | 7 | Gravity formula using the data on St. 1 |
| D | 6 | Luzon South Expressway & Service Road at Nichols |

2. 124 means "Compair the designated zone pair trips in St. 1 and St. 2. Select the larger trips and add them to the zone pair trips in St. 4."
3. 126 means "Compair the designated zone pair trips in St. 1 and St. 2. Select the larger trips and add them to the zone pair trips in Index 6.
4. 23 means "Add the designated zone pair trips in St. 2 with those in St. 3.

APPENDIX TABLE 4.3–8 SOUTH EXPRESSWAY: CHANGES OF TRAFFIC: APRIL AND MAY 1978–81

All tolled vehicles/month

| | 1978 1) | 1979 | 1980 2) | 1981 |
|---|---|---|---|---|
| April | 1,135,627 | 1,646,015 | 1,761,236 | 1,346,613 |
| May | 1,294,152 | 1,869,163 | 1,902,185 | 1,436,971 |
| Total | 2,429,779 | 3,515,178 | 3,663,421 | 2,783,584 |
| | (0.691) | (1.000) | (1.042) | (0.792) |

Notes: 1) The section between Calamba and Alabang was opened in May 1978.

2) The reduction was caused by the increase of toll rate in July 1980 approximately by 50%.

Source: Tollways Department, CDCP



APPENDIX TABLE 4.3–9 SOUTH EXPRESSWAY, NICHOLS PLAZA, CHANGES OF TRAFFIC BY MONTH, 1979

All tolled vehicles/month

| | Jan | Feb | Mar | April | May | June | July | Aug |
|---|---|---|---|---|---|---|---|---|
| Entry | 619,367 | 560,352 | 630,088 | 558,497 | 636,002 | 634,632 | 640,005 | 657,206 |
| Exit | 738,964 | 687,736 | 793,419 | 714,962 | 816,348 | 798,424 | 789,718 | 806,224 |
| Total | 1,358,331 | 1,248,088 | 1,423,507 | 1,273,459 | 1,452,350 | 1,433,056 | 1,429,723 | 1,463,430 |
| Ratio | (0.965) | (0.886) | (1.011) | (0.904) | (1.031) | (1.018) | (1.015) | (1.039) |

| | Sept | Oct | Nov | Dec | Total | Average | (Average/day |
|---|---|---|---|---|---|---|---|
| Entry | 628,661 | 659,265 | 616,061 | 679,010 | 7,519,146 | 626,596 | (20887) |
| Exit | 785,241 | 813,791 | 776,722 | 858,698 | 9,380,247 | 781,687 | (26056) |
| Total | 1,413,902 | 1,473,056 | 1,392,783 | 1,537,708 | 16,899,393 | 1,408,283 | (46943) |
| Ratio | (1.004) | (1.046) | (0.988) | (1.092) | | (1.000) | |

Notes: In May AADT factor is 1/1.031 = 0.970.

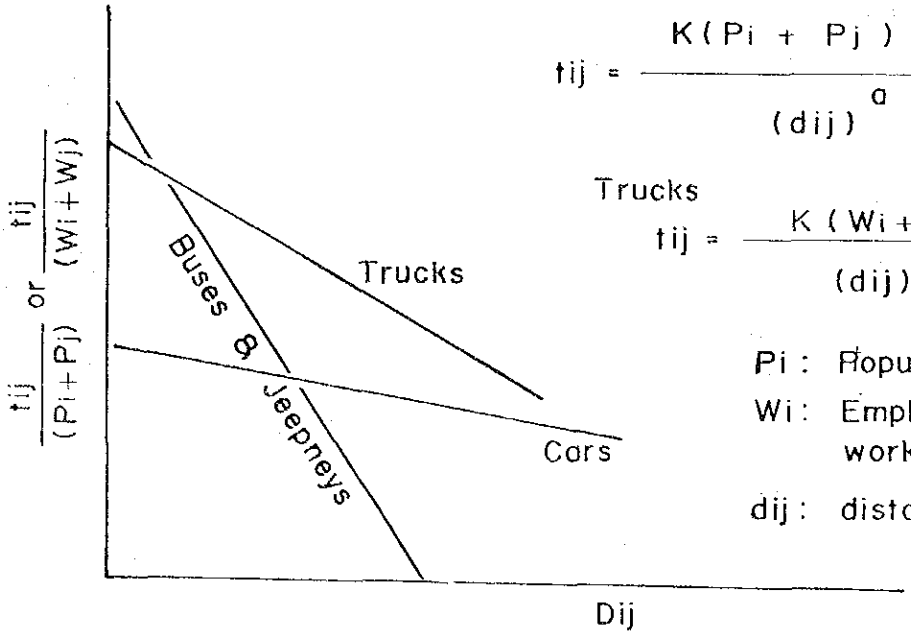
Source: Ibid

APPENDIX TABLE 4.3–10 VEHICLE COUNT – LUZON SOUTH EXPRESSWAY ; APRIL 19–25 1981
VEHICLES BY TYPE

| PLAZA | DIRECTION | | Sm & Je 1 | SB 2 | Trucks 3 | 4 | 5 | 6 | 7 | 8 | Buses 9 | TOTAL | ADT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NICHOLS | ENTRY | | 144,714 | 10,976 | 2,797 | 475 | 318 | 10 | 459 | 4 | 13,776 | 173,529 | 24,790 |
| | EXIT | | 159,909 | 11,416 | 3,067 | 435 | 278 | 6 | 505 | | 12,254 | 187,870 | 26,839 |
| BICUTAN | ENTRY | N | 34,312 | 2,423 | 563 | 81 | 42 | | 70 | 1 | 2,643 | 40,135 | 5734 |
| | | S | 8,689 | 1,510 | 725 | 42 | 36 | | 44 | | 5,917 | 16,963 | 2423 |
| | EXIT | N | 9,180 | 1,220 | 377 | 65 | 30 | | 50 | | 797 | 11,719 | 1674 |
| | | S | 34,080 | 2,141 | 402 | 63 | 38 | | 70 | | 5,034 | 41,828 | 5975 |
| SUCAT | ENTRY | N | 47,967 | 1,516 | 322 | 31 | 32 | 1 | 28 | 1 | 863 | 50,761 | 7252 |
| | | S | 4,460 | 624 | 171 | 4 | 2 | | 24 | | 5,316 | 10,601 | 1514 |
| | EXIT | N | 3,065 | 378 | 53 | 7 | 11 | 4 | 2 | | 562 | 4,082 | 583 |
| | | S | 48,714 | 1,618 | 282 | 28 | 11 | | 32 | | 5,881 | 56,566 | 8081 |
| ALABANG | ENTRY | N | 42,656 | 3,654 | 1,470 | 203 | 83 | 1 | 151 | | 9,695 | 57,913 | 8273 |
| | | S | 2,839 | 595 | 161 | 16 | 16 | | 29 | | 3,332 | 6,988 | 998 |
| | EXIT | N | 5,783 | 789 | 226 | 7 | 4 | 1 | 33 | 1 | 4,515 | 11,359 | 1623 |
| | | S | 36,664 | 3,219 | 1,220 | 185 | 120 | | 156 | | 9,402 | 50,966 | 7281 |
| CARMONA | ENTRY | | 16,730 | 1,913 | 283 | 29 | 29 | 8 | 142 | 4 | 440 | 19,578 | 2797 |
| | EXIT | | 15,030 | 1,916 | 346 | 30 | 25 | | 115 | | 146 | 17,608 | 2515 |
| CALAMBA | ENTRY | | 38,903 | 5,150 | 1,104 | 125 | 114 | 5 | 243 | | 5,772 | 51,416 | 7345 |
| | EXIT | | 35,396 | 4,381 | 1,066 | 137 | 118 | 2 | 245 | 2 | 5,825 | 47,172 | 6739 |
| TOTAL | ENTRY | | 341,270 | 28,361 | 7,596 | 1,006 | 672 | 25 | 1,190 | 10 | 47,754 | 427,884 | 61126 |
| | EXIT | | 347,821 | 27,078 | 7,039 | 957 | 635 | 13 | 1,208 | 3 | 44,416 | 429,170 | 61310 |

SOURCE: Ibid.

APPENDIX FIG. 4.3-1 GRAVITY MODEL PARAMETERS

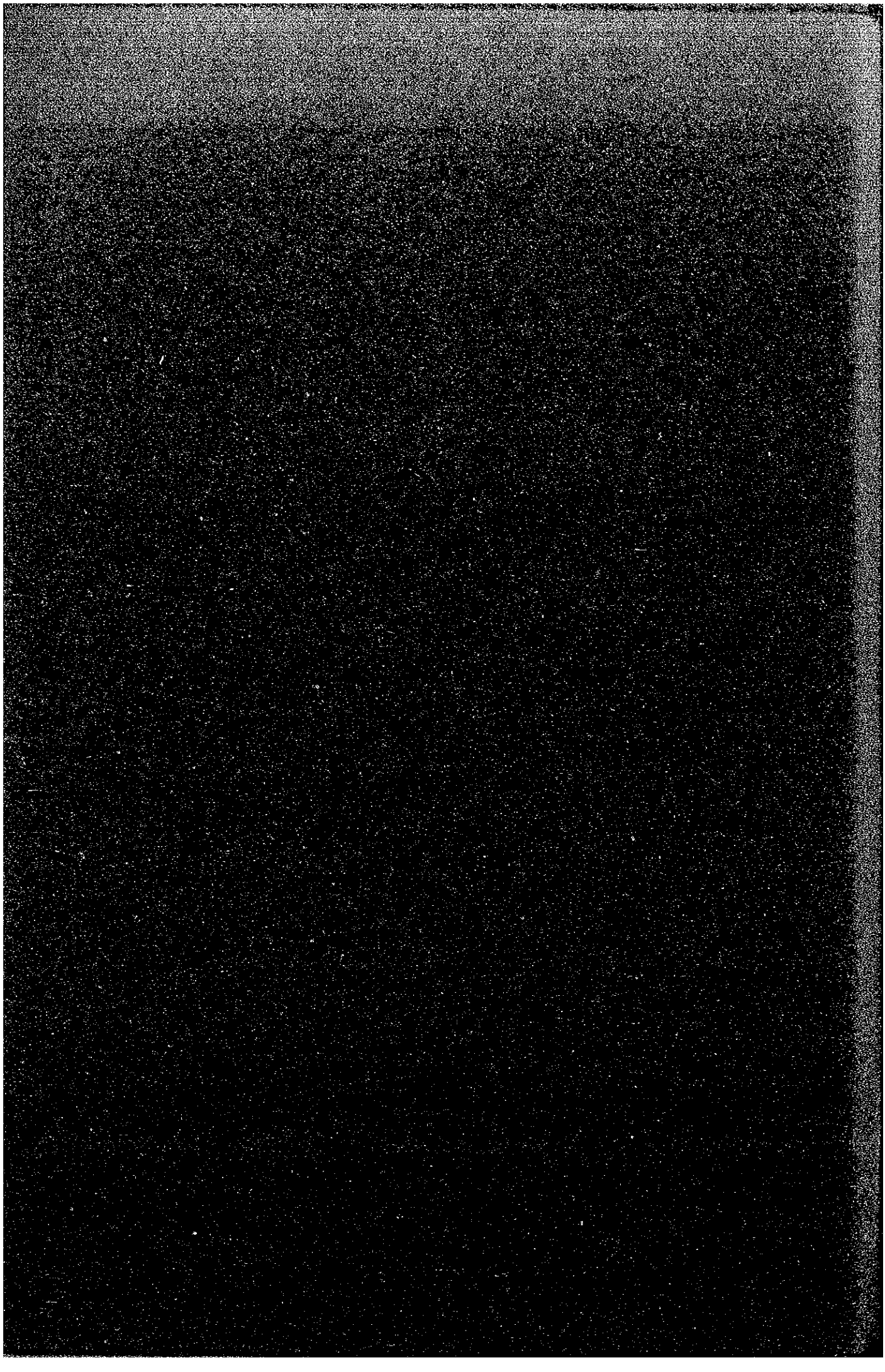



Parameters by regression analysis of the data on O D station No.1 at Quirino Avenue

| | K | a | r |
|---|---|---|---|
| BUS,- JEEP | 0.72184 | 2.89385 | r = 0.67228 |
| CAR | $1.22832 \times 10^{-6}$ | 1.31985 | r = 0.72838 |
| TRUCK | $4.07418 \times 10^{-5}$ | 1.81179 | r = 0.88578 |

Remarks: In order to curb the deviation which might resulted in too large or too small estimated trips by using this model, the calculated tij were summed up into four groups as identifiable in Appendix Table 4.3-7 and adjusted to the summed up total of the corresponding O-D Trips in 1980 produced from the MMETROPLAN forecast

# APPENDIXES FOR CHAPTER 5



## APPENDIX TABLE 5.2–1 GROSS NATIONAL PRODUCT, NATIONAL INCOME AND GROSS DOMESTIC PRODUCT BY INDUSTRIAL ORIGIN, CY 1967–79

(In million pesos at constant 1972 prices)

| Industry | 1967 | 1968 | 1969 | 1970 | 1971 | 1972 | 1973 | 1974 | 1975 | 1976 | 1977r | 1978r | 1979a |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. AGRICULTURE, FISHERY AND FORESTRY | 13,052 | 13,981 | 14,412 | 14,734 | 15,457 | 16,040 | 17,026 | 17,465 | 18,218 | 19,671 | 20,646 | 21,633 | 22,585 |
| 2. INDUSTRIAL SECTOR | 12,766 | 13,392 | 14,117 | 15,048 | 16,222 | 17,442 | 19,586 | 20,710 | 22,690 | 24,904 | 26,815 | 28,577 | 30,491 |
| a. Mining and Quarrying | 664 | 802 | 926 | 1,093 | 1,282 | 1,346 | 1,400 | 1,403 | 1,445 | 1,491 | 1,742 | 1,810 | 2,129 |
| b. Manufacturing | 9,846 | 10,478 | 10,897 | 11,823 | 12,611 | 13,388 | 15,252 | 15,981 | 16,537 | 17,481 | 18,794 | 20,066 | 21,346 |
| c. Construction | 1,978 | 1,797 | 1,942 | 1,738 | 1,889 | 2,240 | 2,433 | 2,745 | 4,101 | 5,254 | 5,568 | 5,953 | 6,368 |
| d. Electricity Gas & Water | 278 | 320 | 352 | 394 | 440 | 468 | 501 | 581 | 607 | 678 | 711 | 748 | 848 |
| 3. SERVICE SECTOR | 18,275 | 19,166 | 20,250 | 21,232 | 21,847 | 22,593 | 24,319 | 25,964 | 27,453 | 28,387 | 29,902 | 31,649 | 33,463 |
| a. Transport, Communication and Storage | 1,684 | 1,785 | 1,946 | 2,056 | 2,184 | 2,418 | 2,657 | 2,933 | 3,277 | 3,875 | 4,050 | 4,276 | 6,490 |
| b. Commerce | 10,858 | 11,246 | 11,828 | 12,295 | 12,484 | 12,688 | 13,589 | 14,351 | 15,056 | 14,999 | 15,838 | 16,858 | 17,923 |
| c. Services | 5,733 | 6,135 | 6,476 | 6,881 | 7,179 | 7,487 | 8,073 | 8,680 | 9,120 | 9,513 | 10,014 | 10,515 | 11,030 |
| GROSS DOMESTIC PRODUCT at market prices | 44,093 | 46,544 | 48,779 | 51,014 | 53,526 | 56,075 | 60,931 | 64,139 | 68,361 | 72,962 | 77,363 | 81,859 | 86,539 |
| Net Factor Income from the Rest of the World | (869) | (1,004) | (812) | (979) | (605) | (549) | (50) | 600 | 169 | (244) | (201) | 136 | 192 |
| GROSS NATIONAL PRODUCT at market prices | 43,224 | 45,540 | 47,967 | 50,035 | 52,921 | 55,526 | 60,881 | 64,739 | 68,530 | 72,718 | 77,162 | 81,995 | 86,731 |
| Indirect taxes net of subsidies | 2,987 | 3,117 | 3,400 | 3,666 | 4,225 | 4,382 | 5,482 | 6,627 | 7,143 | 6,674 | 6,973 | 7,740 | 8,527 |
| Capital Consumption Allowance | 3,584 | 3,853 | 4,162 | 4,712 | 5,019 | 5,353 | 5,535 | 5,849 | 6,324 | 6,910 | 7,480 | 7,960 | 8,330 |
| NET NATIONAL PRODUCT OR NATIONAL INCOME | 36,653 | 38,570 | 40,405 | 41,657 | 43,677 | 45,791 | 49,864 | 52,263 | 55,063 | 59,134 | 62,709 | 65,895 | 69,874 |

r Revised
a Advance estimates as of December 1979
Source: Statistical Coordination Office, National Economic and Development Authority Through 1980 Philippine Statistical Yearbook

## APPENDIX TABLE 5.2–2 POPULATION OF THE PHILIPPINES

(in thousands)

| | 1960 | '67 | '68 | '69 | 1970 | '71 | '72 | '73 | '74 | '75 | '76 | '77 | '78 | '79 | '80 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Philippines | 27088 | 33,496 | 34,528 | 35,592 | 36,684 | 37,704 | 38,752 | 39,829 | 40,937 | 42,071 | 43,182 | 44,322 | 45,492 | 46,693 | 47,914 |
| Metro Manila | 2462 | 3439 | 3607 | 3784 | 3967 | 4150 | 4341 | 4541 | 4751 | 4970 | 5148 | 5332 | 5523 | 5721 | 5925 |

Remarks: The figures for the years between the census years are estimated by using average growth rates as follows: '60-'70 PH 3.08% p.a. MM 4.89%, '70-'75 PH 2.78% p.a., MM 4.61% p.a. and '75-'80 2.64% p.a. and MM 3.58% p.a.

Sources: NEDA 1980 Philippine Statistical Yearbook for the population of 1960, 1970 and 1975, respectively.
The population in 1980 are by the Preliminary Report, 1980 Census of Population, NCSO in NEDA.

APPENDIX TABLE 5.2–3 POPULATION, GDP, GDP PER CAPITA, AND RATIO OF INCREASE, 1970 – 1979

| | 1970 | 1971 | 1972 | 1973 | 1974 | 1975 | 1976 | 1977 | 1978 | 1979 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1) GDP in million pesos | 51,014 | 53,526 | 56,075 | 60,931 | 64,139 | 68,361 | 72,962 | 77,363 | 81,859 | 86,539 |
| 2) Population in thousand | 36,684 | 37,704 | 38,752 | 39,829 | 40,937 | 42,071 | 43,182 | 44,322 | 45,492 | 46,693 |
| 3) Per Capita GDP in pesos | 1,391 | 1,420 | 1,447 | 1,530 | 1,567 | 1,625 | 1,690 | 1,745 | 1,799 | 1,853 |
| 4) Ratio of Increase of per capita GDP | 1.00 | 1.02 | 1.04 | 1.10 | 1.13 | 1.17 | 1.21 | 1.25 | 1.29 | 1.33 |
| | 3.2% p.a. | | | | | | | 3.4% p.a. | | |

Remarks: GDP and per capita GDP are in constant prices of 1972.

Source: NEDA, 1980 Philippine Statistical Yearbook & APPENDIX TABLES 5.2-1 and 5.2-2

APPENDIX TABLE 5.2–4 RESUME OF MMETROPLAN: DEMOGRAPHY AND TRAFFIC

| | 1971 | | 1980 | | 1990 | | 2000[1] | | Sources in MMETROPLAN |
|---|---|---|---|---|---|---|---|---|---|
| **A. POPULATION** | | | | | | | | | |
| Study Area in '000 | 5,198 | | 7,677 | | 10,550 | | (13,700) | | Table 4.3, Volume I |
| Growth Rate p.a. (%) | | 4.43% | | 3.28% | | (2.6%) | | | |
| **B. FAMILIES** | | | | | | | | | |
| NCO (Non-car owners) | 697,279 | | 986,742 | | 1,308,200 | | (1,675,000) | | |
| Growth Rate p.a. (%) | | 82.5% | | 74.5% | | 62% | | (55%) | Table 9 & 6, |
| CO (Car owners) | 148,061 | | 336,879 | | 801,800 | | (1,370,000) | | D18, 5.01 & |
| Growth Rate p.a. (%) | | 17.5% | | 25.5% | | 38% | | (45%) | Table 5, D19 |
| **C. POPULATION by the two classifications** | | | | | | | | | |
| Persons/Family | 6.15 | | 5.8 | | 5.0 | | (4.5) | | |
| NCO | 4,288,300 | | 5,723,200 | | 6,541,000 | | (7,537,500) | | Fig. 3 & 3.01, |
| CO | 910,600 | | 1,953,900 | | 4,009,000 | | (6,165,000) | | D18 |
| Total | 5,198,900 | | 7,677,100 | | 10,550,000 | | (13,702,500) | | |
| **D. TRIP RATE:** | | | | | | | | | |
| Trips/Population | | | | | | | | | |
| NCO | 5500/4288.3 | | 7746/5723.2 | | 8572/6541 | | (10929/7537.5) | | |
| (Public Transport Users) | =1.282 | | =1.353 | | =1.311 | | (=1.450) | | |
| CO | 1269/910.6 | | 2586/19539 | | 6553/4009 | | (104805/6165) | | Table 7, T22 |
| (Private Vehicle Users) | =1.394 | | =1.324 | | =1.635 | | (=1.700) | | |
| **E. OVERALL TRAFFIC GROWTH in terms of persons ('000)** | | | | | | | | | |
| NCO (PTU) | 5,500 | | 7,746 | | 8,572 | | (10,929) | | |
| | | | | 1.0% p.a. | | 2.5% p.a. | | | |
| CO (PVU) | 1,269 | | 2,586 | | 6,553 | | (10,481) | | |
| | | | | 9.7% p.a. | | 4.8% p.a. | | | |
| Total | 6,769 | | 10,332 | | 15,125 | | (21,410) | | |
| | | | | 3.9% p.a. | | 3.5% p.a. | | | |

Notes: 1) Extrapolated by the Team.
Source: Gov. of PH & Freeman Fox and Ass., MMETROPLAN, July 1977

APPENDIX TABLE 5.3-1 ESTIMATE OF POPULATION BY ZONE

(Population in thousands)

| Zone No. | 1980 | 1990 | 2000 | Annual Growth Rate (%) | | |
|---|---|---|---|---|---|---|
| | | | | 1980-90 | 1990-2000 | 1980-2000 |
| 1 | 55 | 87 | 121 | 4.69 | 3.35 | 4.02 |
| 2 | 21 | 29 | 39 | 3.28 | 3.00 | 3.14 |
| 3 | 44 | 70 | 98 | 4.75 | 3.42 | 4.08 |
| 4 | 18 | 28 | 40 | 4.52 | 3.63 | 4.07 |
| 5 | 45 | 67 | 90 | 4.06 | 3.00 | 3.53 |
| 6 | 0 | 15 | 30 | — | — | 7.18 |
| 7 | 65 | 119 | 176 | 6.23 | 3.99 | 5.11 |
| 8 | 32 | 68 | 105 | 7.83 | 4.44 | 6.12 |
| 9 | 20 | 61 | 104 | 11.80 | 5.48 | 8.59 |
| 10 | 61 | 116 | 175 | 6.64 | 4.20 | 5.41 |
| 11 | 49 | 130 | 215 | 10.25 | 5.16 | 7.67 |
| 12 | 23 | 79 | 136 | 13.13 | 5.58 | 9.29 |
| 13 | 43 | 56 | 70 | 2.68 | 2.26 | 2.47 |
| 14 | 27 | 58 | 92 | 7.95 | 4.72 | 6.32 |
| 15 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16 | 73 | 125 | 180 | 5.53 | 3.71 | 4.62 |
| 17 | 18 | 29 | 42 | 4.88 | 3.77 | 4.33 |
| 18 | 39 | 48 | 57 | 2.10 | 1.73 | 1.92 |
| 19 | 40 | 63 | 90 | 4.65 | 3.63 | 4.14 |
| 20 | 8 | 14 | 20 | 5.76 | 3.63 | 4.69 |
| 21 | 75 | 117 | 162 | 4.55 | 3.31 | 3.93 |
| 22 | 40 | 50 | 62 | 2.26 | 2.17 | 2.22 |
| 23 | 136 | 180 | 227 | 2.84 | 2.35 | 2.59 |
| 24 | 149 | 257 | 373 | 5.60 | 3.80 | 4.70 |
| 25 | 52 | 82 | 114 | 4.66 | 3.35 | 4.00 |
| 26 | 44 | 61 | 81 | 3.32 | 2.88 | 3.10 |
| 27 | 13 | 17 | 20 | 2.72 | 1.64 | 2.18 |
| 28 | 246 | 250 | 262 | 0.16 | 0.47 | 0.32 |
| 29 | 57 | 82 | 108 | 3.70 | 2.79 | 3.25 |
| 30 | 8 | 9 | 10 | 1.18 | 1.06 | 1.12 |
| 31 | 81 | 103 | 129 | 2.43 | 2.28 | 2.35 |
| 32 | 0 | 20 | 40 | — | — | 7.18 |
| 33 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sub-Total | 1,582 | 2,490 | 3,468 | 4.64 | 3.37 | 4.00 |
| 134 | 665 | 795 | 925 | 1.80 | 1.53 | 1.66 |
| 135 | 85 | 106 | 127 | 2.23 | 1.82 | 2.03 |
| 136 | 134 | 198 | 261 | 3.98 | 2.80 | 3.39 |
| 137 | 266 | 551 | 736 | 7.55 | 2.94 | 5.22 |
| 138 | 126 | 208 | 290 | 5.14 | 3.38 | 4.26 |
| 139 | 840 | 941 | 1,042 | 1.14 | 1.02 | 1.08 |
| 140 | 667 | 783 | 898 | 1.62 | 1.38 | 1.50 |
| 141 | 899 | 1,056 | 1,113 | 1.62 | 0.53 | 1.07 |
| 142 | 314 | 525 | 635 | 5.27 | 1.92 | 3.58 |
| 143 | 134 | 227 | 320 | 5.41 | 3.49 | 4.45 |
| 144 | 127 | 131 | 134 | 0.31 | 0.23 | 0.27 |
| 145 | 958 | 1,094 | 1,150 | 1.34 | 0.50 | 0.92 |
| 146 | 28 | 35 | 42 | 2.26 | 1.84 | 2.05 |
| Sub-Total | 5,243 | 6,650 | 7,673 | 2.41 | 1.44 | 1.92 |
| 247 | 281 | 383 | 481 | 3.15 | 2.30 | 2.72 |
| 248 | 84 | 106 | 124 | 2.35 | 1.58 | 1.97 |
| 249 | 163 | 252 | 337 | 4.45 | 2.95 | 3.70 |
| Sub-Total | 528 | 741 | 942 | 3.45 | 2.43 | 2.94 |
| Total | 7,353 | 9,881 | 12,083 | 3.00 | 2.03 | 2.51 |

Source: Appendix Table 3.5-4 ∿ 3.5-6.

APPENDIX TABLE 5.3-2 ESTIMATED EMPLOYMENT BY ZONE: 1980, 1990 AND 2000

| Zone No. | Employed Persons by Workplace | | | Annual Growth Rate (%) | | |
|---|---|---|---|---|---|---|
| | 1980 | 1990 | 2000 | 1980–1990 | 1990–2000 | 1980–2000 |
| 1 | 6,500 | 7,250 | 8,650 | 1.10 | 1.78 | 1.44 |
| 2 | 2,860 | 4,140 | 5,540 | 3.77 | 2.96 | 3.36 |
| 3 | 12,880 | 15,330 | 18,330 | 1.76 | 1.80 | 1.78 |
| 4 | 5,230 | 5,820 | 7,120 | 1.07 | 2.04 | 1.55 |
| 5 | 18,150 | 19,730 | 24,130 | 0.84 | 2.03 | 1.43 |
| 6 | 0 | 3,000 | 6,000 | – | – | 7.18 |
| 7 | 19,530 | 20,400 | 26,000 | 0.44 | 2.46 | 1.44 |
| 8 | 1,840 | 7,220 | 10,720 | 14.65 | 4.03 | 9.21 |
| 9 | 8,000 | 13,300 | 17,600 | 5.21 | 2.84 | 4.02 |
| 10 | 25,000 | 30,900 | 37,300 | 2.14 | 1.90 | 2.02 |
| 11 | 20,000 | 26,000 | 31,700 | 2.66 | 2.00 | 2.33 |
| 12 | 1,430 | 7,020 | 15,720 | 17.25 | 8.40 | 12.73 |
| 13 | 2,860 | 6,030 | 12,930 | 7.74 | 7.93 | 7.84 |
| 14 | 7,650 | 10,420 | 14,720 | 3.14 | 3.52 | 3.33 |
| 15 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16 | 8,650 | 11,580 | 16,480 | 2.96 | 3.59 | 3.28 |
| 17 | 2,510 | 4,300 | 9,600 | 5.53 | 8.36 | 6.94 |
| 18 | 8,670 | 9,000 | 13,300 | 0.37 | 3.98 | 2.16 |
| 19 | 5,970 | 8,150 | 13,050 | 3.16 | 4.82 | 3.99 |
| 20 | 1,960 | 3,050 | 6,750 | 4.52 | 8.27 | 6.38 |
| 21 | 12,700 | 17,800 | 22,500 | 3.43 | 2.37 | 2.90 |
| 22 | 3,940 | 4,950 | 11,250 | 2.31 | 8.56 | 5.39 |
| 23 | 12,760 | 18,000 | 23,100 | 3.50 | 2.53 | 3.01 |
| 24 | 33,970 | 54,210 | 90,810 | 4.78 | 5.29 | 5.04 |
| 25 | 7,820 | 11,200 | 19,200 | 3.66 | 5.54 | 4.59 |
| 26 | 10,970 | 12,830 | 18,230 | 1.58 | 3.58 | 2.57 |
| 27 | 3,990 | 6,010 | 10,910 | 4.18 | 6.14 | 5.16 |
| 28 | 92,320 | 124,000 | 155,700 | 2.99 | 2.30 | 2.64 |
| 29 | 8,010 | 10,710 | 28,410 | 2.95 | 10.25 | 6.53 |
| 30 | 4,410 | 10,700 | 13,200 | 9.27 | 2.12 | 5.63 |
| 31 | 31,630 | 51,800 | 66,000 | 5.06 | 2.45 | 3.75 |
| 32 | 0 | 31,000 | 40,400 | – | – | 2.68 |
| 33 | 18,000 | 103,100 | 135,500 | 19.07 | 2.77 | 10.62 |
| Sub-Total | 400,210 | 669,950 | 928,850 | 5.29 | 3.32 | 4.30 |
| 134 | 249,700 | 393,300 | 503,100 | 4.65 | 2.49 | 3.56 |
| 135 | 13,000 | 14,500 | 19,400 | 1.10 | 2.95 | 2.02 |
| 136 | 42,160 | 68,220 | 88,120 | 4.93 | 2.59 | 3.75 |
| 137 | 81,750 | 105,900 | 129,700 | 2.62 | 2.05 | 2.33 |
| 138 | 111,360 | 136,240 | 175,240 | 2.04 | 2.55 | 2.29 |
| 139 | 274,020 | 388,650 | 492,750 | 3.56 | 2.40 | 2.98 |
| 140 | 418,200 | 504,200 | 646,400 | 1.89 | 2.52 | 2.20 |
| 141 | 253,400 | 319,350 | 403,650 | 2.34 | 2.37 | 2.36 |
| 142 | 146,010 | 198,500 | 250,300 | 3.12 | 2.35 | 2.73 |
| 143 | 34,500 | 44,500 | 56,900 | 2.58 | 2.49 | 2.53 |
| 144 | 17,330 | 42,020 | 46,420 | 9.26 | 1.00 | 5.05 |
| 145 | 262,480 | 311,220 | 335,920 | 1.72 | 0.77 | 1.24 |
| 146 | 15,700 | 22,700 | 28,400 | 3.76 | 2.27 | 3.01 |
| Sub-Total | 1,919,610 | 2,549,300 | 3,176,300 | 2.88 | 2.22 | 2.55 |
| 247 | 53,520 | 58,050 | 81,650 | 0.82 | 3.47 | 2.13 |
| 248 | 17,670 | 21,580 | 33,280 | 2.02 | 4.43 | 3.22 |
| 249 | 43,680 | 51,120 | 71,920 | 1.59 | 3.47 | 2.52 |
| Sub-Total | 114,870 | 130,750 | 186,850 | 1.30 | 3.63 | 2.46 |
| Grand-Total | 2,434,690 | 3,350,000 | 4,292,000 | 3.24 | 2.51 | 2.88 |

Remarks: Zoning map and zone coding table is shown in Fig. 4.3-1 and Appendix Table 4.3-1, respectively.

Source: Appendix Tables 3.5-4 ∿3.5-6.

APPENDIX TABLE 5.3-3 TRIP GENERATION MODEL FORMULAS

| | D I Z (Zone 1 - 33) | | | North Area (Zone 34-46) 1) | | | South Area (Zone 47-49) 2) | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | a | b | (r) | a | b | (r) | | | | |
| Sm V. | 0.0785 | 0.6951 | 0.916 | - | 0.8291 | 0.973 | 6.7% | and | 4.9% | p.a. |
| Buses | 0.0065 | 0.0578 | 0.913 | - | 0.0620 | 0.975 | 3.0% | and | 1.9% | p.a. |
| Jeepneys | 0.0174 | 0.2473 | 0.861 | - | 0.2367 | 0.973 | 3.0% | and | 1.9% | p.a. |
| Trucks | - | 0.0774 | 0.9600 | - | 0.0801 | 0.955 | 6.0% | and | 4.2% | p.a. |

Notes: 1) The north area covers the center of MMA. Each covers large area having both residences and workplaces. The parameter "a" had a negative value when two variables were included in the regression model formula. Accordingly, one variable formula was adopted.

2) The average annual growth rate of the Study Area as determined in 5.2-4 was adapted.

Remarks: Two variable formula is T90/T81 = a (P90/P81) + b (W90/W81)and one variable formula is T90/T81 = b (W90/W81), where T is the total trips in zone i, P is the population in zone i and W is the employed persons at workplace in zone i, each at its respective year. No tii trips were enumerated in Ti.