CHAPTER 4
EXISTING TRAFFIC CONDITIONS

4.1 TRAFFIC SURVEYS UNDERTAKEN

In order to collect the basic traffic data and grasp the current traffic characteristics in the Metro Bacolod, traffic surveys were carried out. They consist of four types of surveys as summarized in Table 4.1-1; traffic counting survey for either 12 hours or 24 hours, roadside OD survey, terminal survey and traffic speed survey.

TABLE 4.1-1 TRAFFIC SURVEYS

Surveys	Method	Survey Stations	Survey Period
12-hour Traffic count	Manual count by direction and vehicle type. Recorded by every hour.	40 stations (Figure4.1.1)	From 6:00AM to 6:00PM 2003/4/23-5/9 (weekday)
24-hour Traffic count	Manual count by direction and vehicle type. Recorded by every hour.	8 stations (Figure4.1.1)	From 6:00AM to 6:00AM 2003/4/23-5/9 (weekday)
OD Survey*	Roadside interview survey for drivers including interview with passengers for buses and jeepneys.	5+3 stations (included ports, airport terminal OD)	From 6:00AM to 6:00AM 2003/4/23-5/9 (weekday)
Terminal Survey	Interview with drivers and passengers, Terminal layout plan, number of bays, parking capacity, bus/jeepney routes, number of bus/jeepney for each route, facilities for waiting passengers, etc.	7 terminals (bus terminals, jeepney terminals) (Figure4.1.1)	2003/4/23-5/9 (weekday)
Travel Time Survey	For a car and truck, a floating car method. For a bus and a jeepney, surveyors rode on a bus/jeepney to measure travel time.	10 routes (Figure4.1.2)	3 times (morning, afternoon and evening) per day

The interviews for roadside OD survey were undertaken by random sampling. As shown in Table 4.1-2, the sampling rate ranges from 10% to 93% of the total traffic depending on the survey station. The number of samples seems to be sufficient to obtain the required accuracy for the traffic zoning system even for the case of the lowest sampling rate.

* 3-more Traffic Counts and OD Survey were conducted at Bacolod Airport, Bacolod Ferry Port and Cargo Port (Bacolod & Pulupandan), in addition to Roadside Traffic Counts & OD Survey, to obtain necessary data for other transport related facilities.

TABLE 4.1-2 SAMPLING RATE OF ROADSIDE & TERMINAL OD SURVEY

Type pf Survey	Station No.	Station Point	*Total Traffic Volume		No. of Sample Interviewed		Average Sampling Rate(%)	
			Vehicle/Driver	Passenger	Vehicle/Driver	Passenger	Vehicle/Driver	Passenger
Roadside OD	41	Valladolid-Bago	6,816	49,530	1,625	1,553	23.8	3.1
	42	Manpla-Victrorias	6,222	27,496	1,460	1,468	23.5	5.3
	43	Bacolod-Murcia	4,180	18,844	1,432	1,731	34.3	9.2
	44	Bacolod-Bago	20,718	130,316	2,355	2,990	11.4	2.3
	45	Bacolod-Talisay	20,314	85,592	2,035	1,564	10.0	1.8
	Total		**58,250**	**311,778**	**8,907**	**9,306**	**15.3**	**3.0**
Passenger Terminal OD	47	Bacolod Airport	-	1,875	-	1,138	-	60.7
	48	Bacolod Ferry	-	6,062	-	1,522	-	25.1
	Total		**-**	**7,937**	**-**	**2,660**	**-**	**33.5**
Cargo Terminal OD	46	Pulupandan Cargo	100	-	93	-	93.0	-
	48	Bacolod Cargo	2,740	-	1,522	-	55.5	-
	Total		**2,840**	**-**	**1,615**	**-**	**56.9**	**-**

Remarks

Vehicle/Driver : Estimated AADT for Roadside Stations and Cargo Terminal Stations

Passenger : Estimated from Observed Average Occupancy for Roadside Stations, or Estimated from A.T.O. & P.P.A. Statistical Data for Passenger Terminal Stations

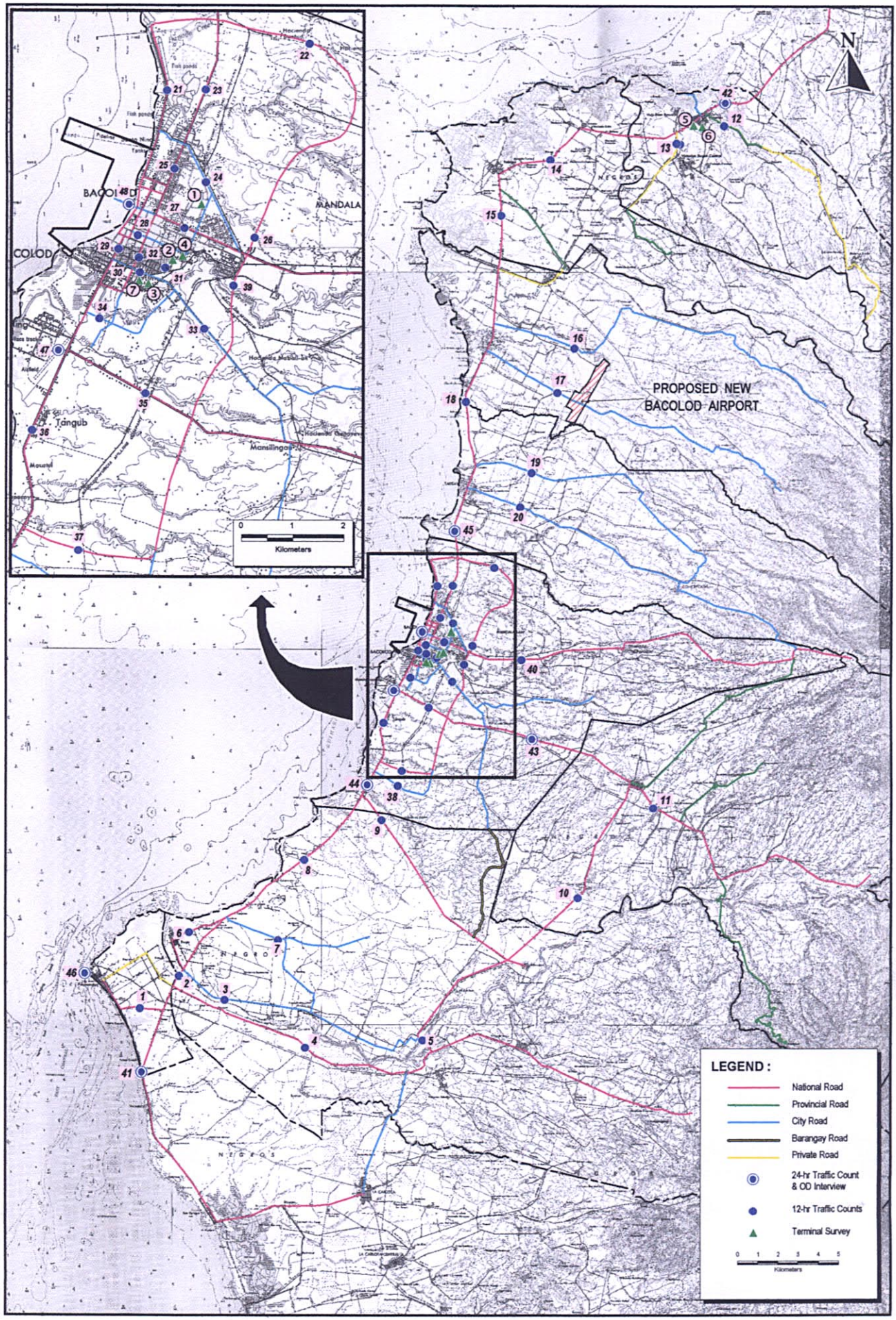


FIGURE 4.1-1 TRAFFIC SURVEY STATIONS (METRO BACOLOD)

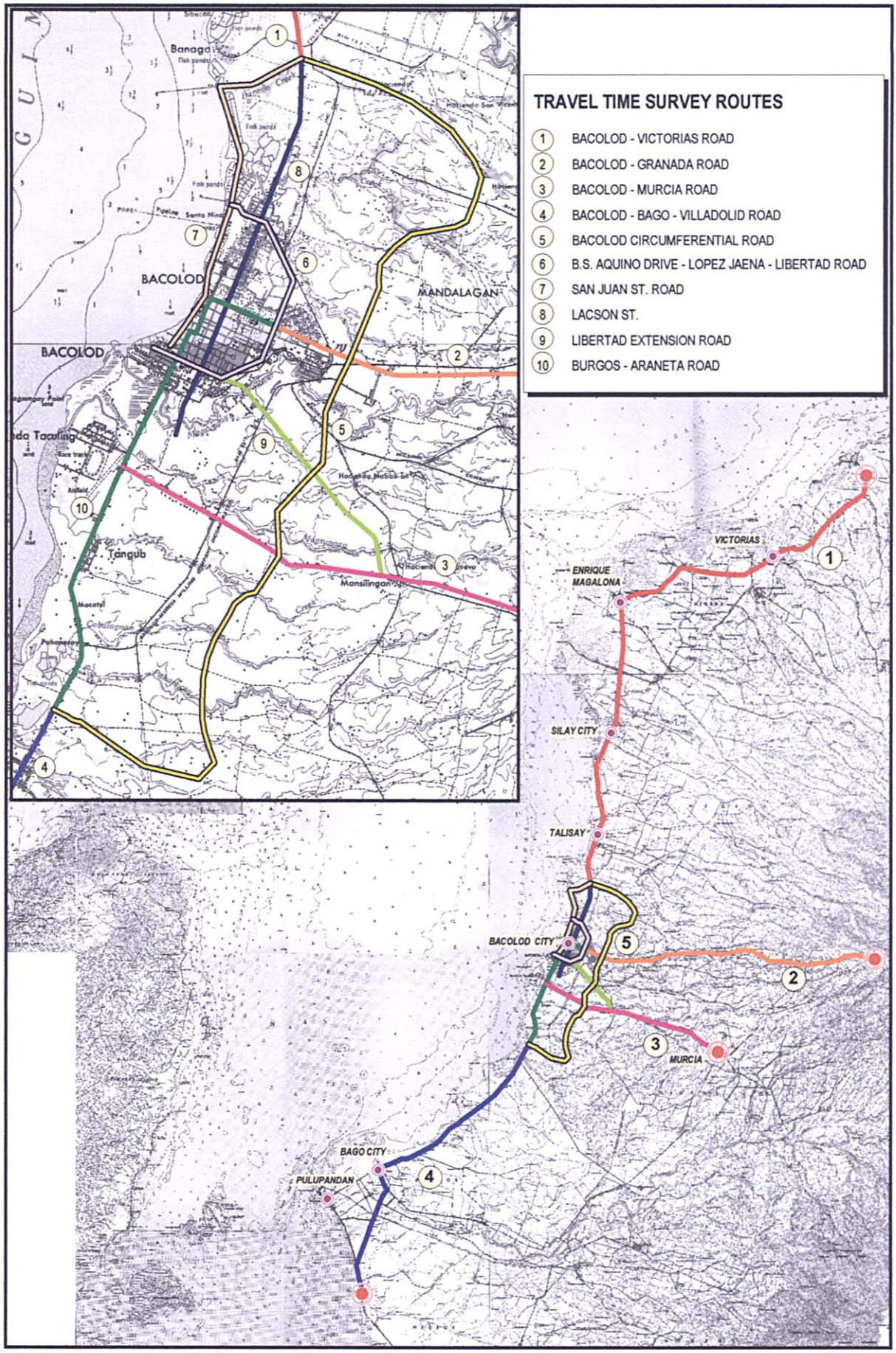


FIGURE 4.1-2 TRAVEL TIME SURVEY ROUTE (METRO BACOLOD)

4.2 TRAFFIC CHARACTERISTICS

4.2.1 Present OD Pattern

1) Traffic Volume on Cordon Line

The total inbound / outbound traffic volume of the Metro Bacolod is shown in Table 4.2-1. Total daily traffic volume from/to the Metro Bacolod is 13,000 vehicles, of which about a half each is crossing the northern and southern borders of the Metro Bacolod. On the other hand, the total inbound and outbound traffic of Bacolod city is 41,000 vehicles/day, which is mostly incoming and outgoing along the Coastal Road in the north-south direction. It is also noted that large numbers of heavy vehicles, trucks and buses are observed at the boundary of Metro Bacolod, while the shares of cars and jeepneys are predominant at the Bacolod city boundary.

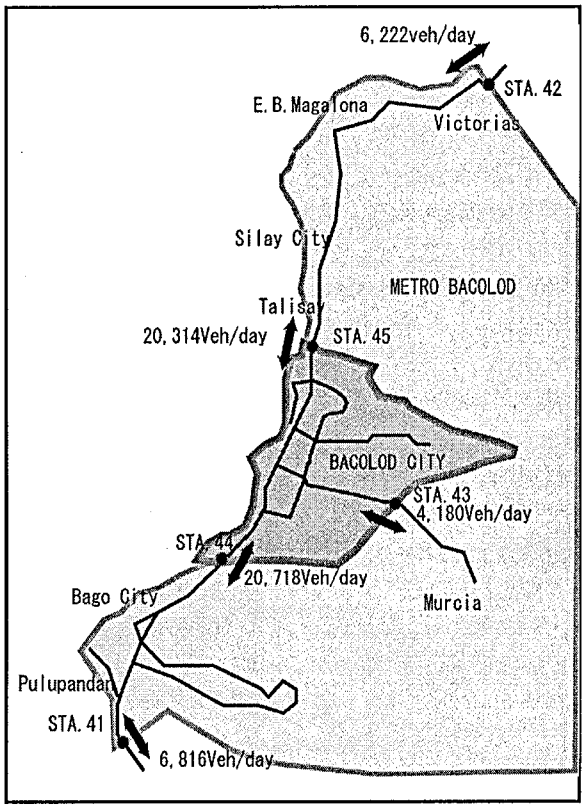


FIGURE 4.2-1 TRAFFIC VOLUME BY CORDON LINE

TABLE 4.2-1 INBOUND/OUTBOUND TRAFFIC OF METRO BACOLOD AND BACOLOD CITY

(Unit: Vehicle /day)

Section	Station No.	Type of Vehicles				
		Car	Jeepney	Bus	Truck	Total
Metro Bacolod (Outer Cordon Line)	41	2,930	628	1,528	1,730	6,816
		43%	9%	22%	25%	100%
	42	2,278	226	894	2,824	6,222
		37%	4%	14%	45%	100%
	Total	5,208	854	2,422	4,554	13,038
		40%	7%	19%	35%	100%
Bacolod City (Innerr Cordon Line)	43	2,016	906	332	926	4,180
		48%	22%	8%	22%	100%
	44	8,258	7,658	1,776	3,026	20,718
		40%	37%	9%	15%	100%
	45	11,136	5,256	1,082	2,840	20,314
		55%	26%	5%	14%	100%
	Total	19,394	12,914	2,858	5,866	41,032
		47%	31%	7%	14%	100%

2) Present OD pattern

Figure 4.2-2 and Figure 4.2-3 show the present OD patterns for passenger trips and cargo flow respectively. In case of passengers, it is expressed by the concentration pattern to Bacolod city from the surrounding cities / municipalities. In case of cargo, it has more varieties; various linkages are observed among the neighboring cities in addition to the concentration pattern onto Bacolod city. The other remarkable point is that the large volume of cargo movement is recognized in relation to the external area; particularly large between Victorias and the external area, such as Manapula, Cadiz etc, which is reflecting the bulky transport demand of sugarcanes

3) Trip Purpose of Passengers

Table 4.2-2 shows the number of passenger trips by purpose at the cordon lines of the Metro Bacolod and Bacolod City. It is found for the cordon line at the Metro Bacolod that the main trip purpose is "private" for both the inbound and outbound traffic. As for the Bacolod city, it is noted that "private" is the prominent purpose of the inbound traffic while "to home" is the main purpose of outbound traffic. It is also noted that with regard to the trips "to work" and "to school", the inbound traffic is higher than the outbound traffic, which is indicating however, significant number of trips is also found for the outbound.

TABLE 4.2-2 TRIP PURPOSE OF PASSENGERS BY CORDON LINE OF METRO BACOLOD AND BACOLOD CITY

(Unit: Person trips/day)

Purpose	Direction	To Work	To school	Bussiness	Private	To Home	Total
Metro Bacolod (STA41,42)	Inbound	1,476	326	3,801	7,703	9,438	22,744
		6%	1%	17%	34%	41%	100%
	Outbound	1,550	372	1,836	11,009	7,685	22,452
		7%	2%	8%	49%	34%	100%
	Total	3,026	698	5,637	18,712	17,123	45,196
		7%	2%	12%	41%	38%	100%
Bacolod City (STA43,44,45)	Inbound	18,742	4,860	8,114	36,314	24,045	92,075
		20%	5%	9%	39%	26%	100%
	Outbound	15,353	2,964	6,448	10,047	61,309	96,121
		16%	3%	7%	10%	64%	100%
	Total	34,095	7,824	14,562	46,361	85,354	188,196
		18%	4%	8%	25%	45%	100%

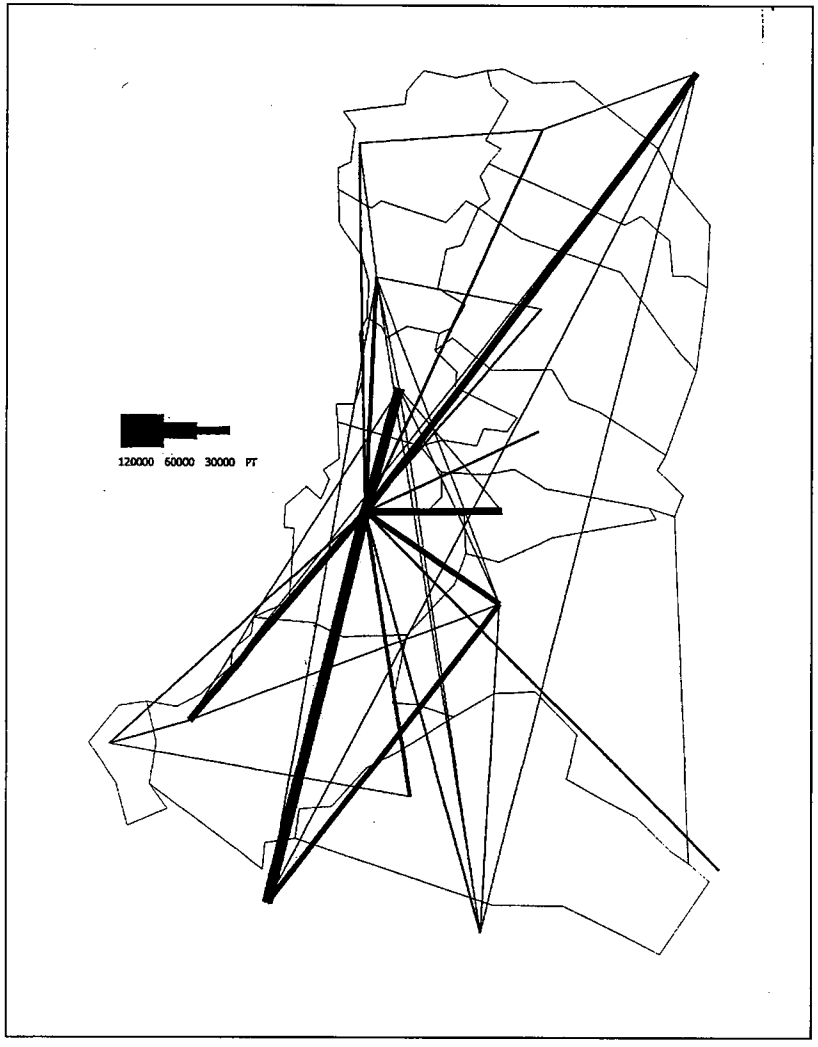


FIGURE 4.2-2 PRESENT DESIRE LINE (PASSENGER)

(Unit: person trips/day)

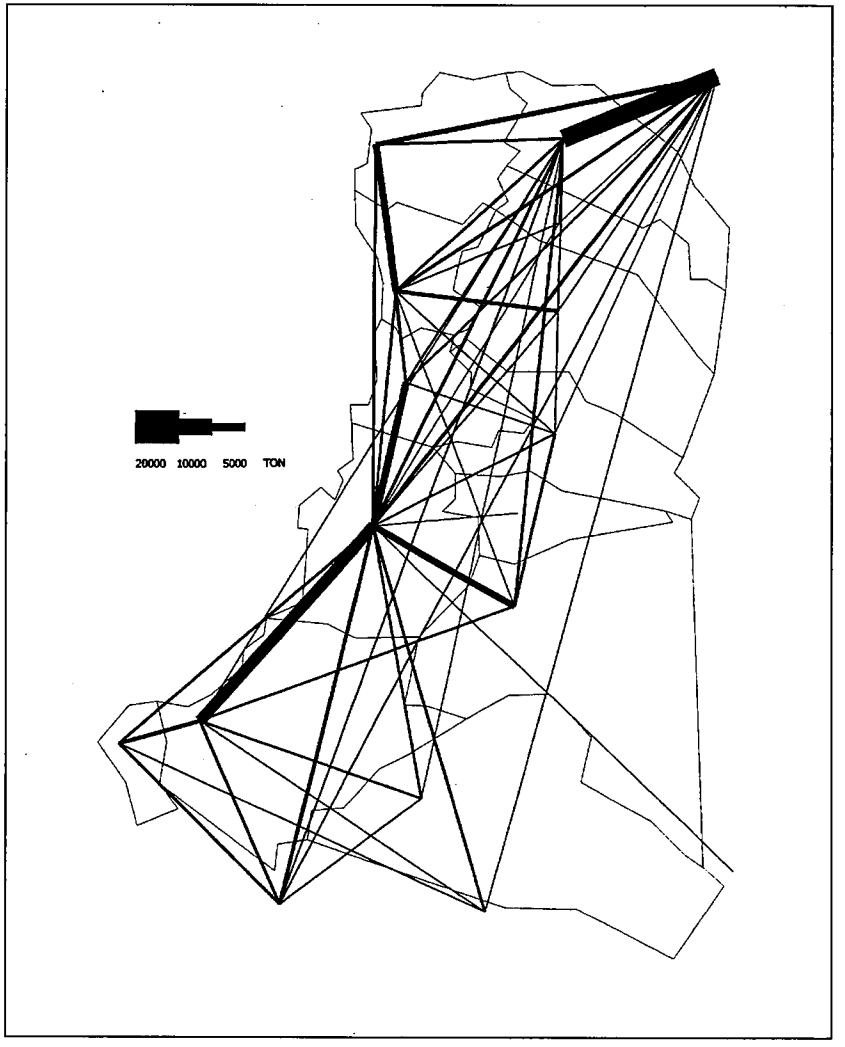


FIGURE 4.2-3 PRESENT DESIRE LINE (CARGO)

(Unit: Ton/day)

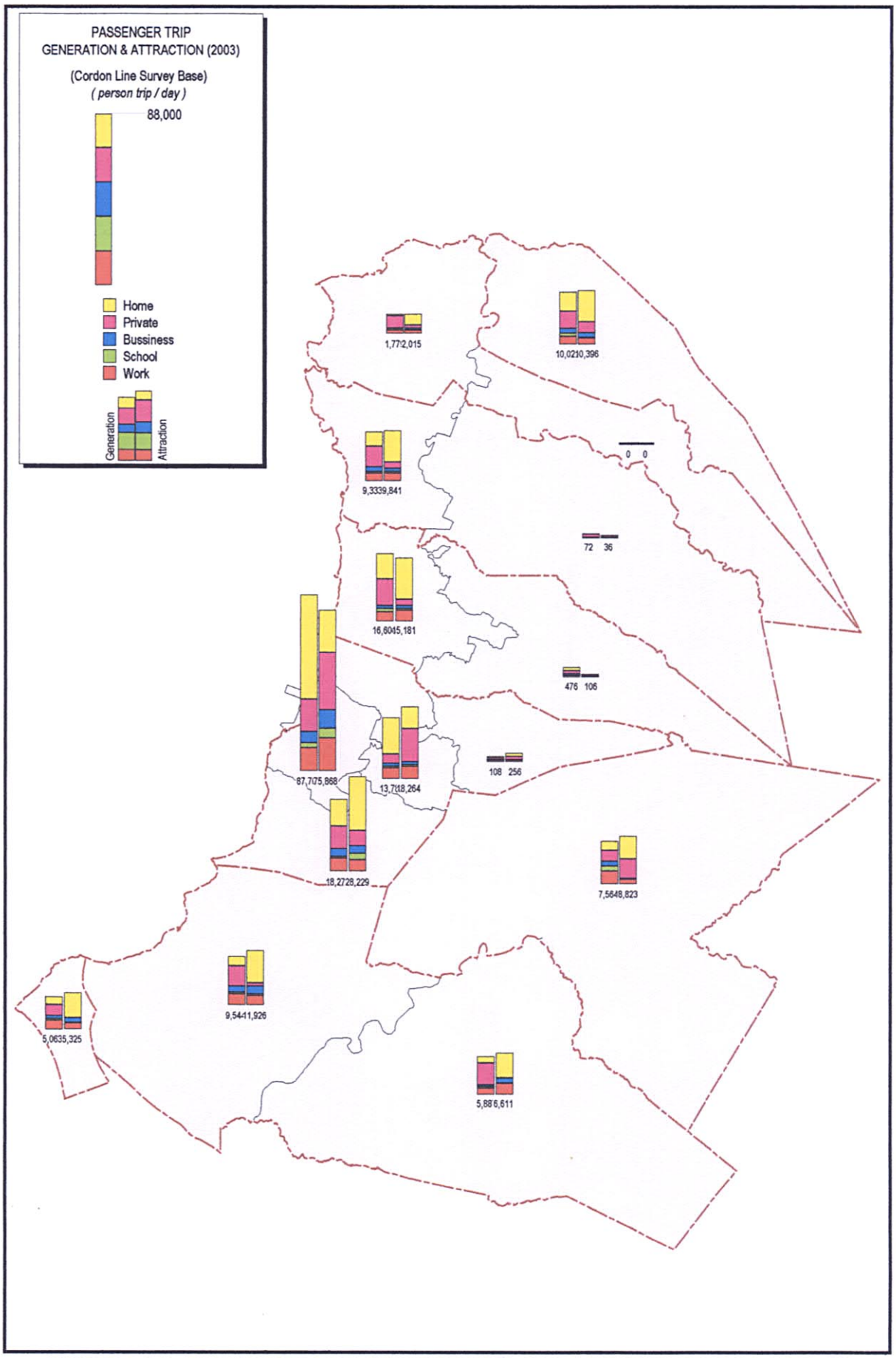


FIGURE 4.2-4 PASSENGER TRIP GENERATION & ATTRACTION IN METRO BACOLOD

4) Type of Commodity

At the boundary of the Metro Bacolod, the inbound cargo of agriculture products is remarkably large; particularly sugarcane has predominant share, more than 70% of the total inbound cargo volume.

As for the cordon line of the Bacolod city, the main inbound cargoes are construction materials, whereas the main outgoing ones are sugarcanes and construction materials. Some of them are considered as the through traffic between the southern area and the northern area of the Metro Bacolod.

TABLE 4.2-3 TYPE OF COMMODITY BY CORDON LINE STATIONS

(Unit: Ton / day)

Commodity	Direction	Agro-Products	Manufact'd Products	Construction materials	Forest,Mining,Mineral	Sugarcane	Container& Empty	Total
Metro Bacolod	Inbound	3,343	522	164	258	12,492	394	17,173
(STA41,42)		19%	3%	1%	2%	73%	2%	100%
	Outbound	1,154	2,072	1,472	720	230	53	5,700
		20%	36%	26%	13%	4%	1%	100%
	Total	4,497	2,594	1,636	978	12,722	447	22,873
		20%	11%	7%	4%	56%	2%	100%
Bacolod City	Inbound	3,634	1,515	10,646	1,402	4,087	680	21,965
(STA43,44,45)		17%	7%	48%	6%	19%	3%	100%
	Outbound	2,921	2,412	3,381	806	5,851	68	15,440
		19%	16%	22%	5%	38%	0%	100%
	Total	6,556	3,927	14,027	2,208	9,938	748	37,404
		18%	10%	38%	6%	27%	2%	100%

Note: "Empty" in the above table includes container weight.

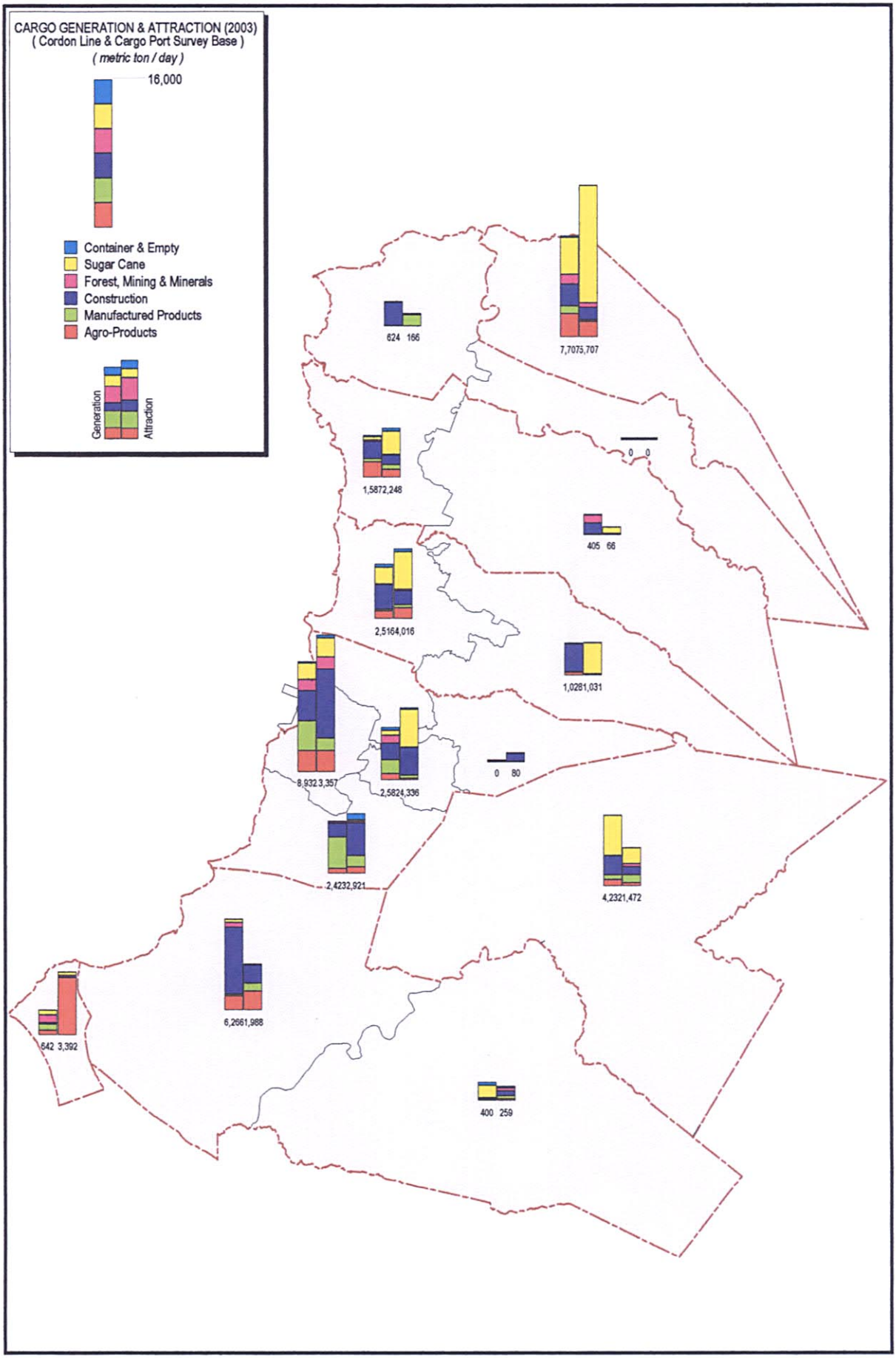


FIGURE 4.2-5 CARGO GENERATION & ATTRACTION IN METRO BACOLOD

4.2.2 Traffic Volume on Roads

1) Survey Result

a) Traffic Volume and Vehicle Composition

Table 4.2-4 shows the results of the traffic counting surveys on major roads in the Metro Bacolod. At the boundary of Metro Bacolod, the total traffic volume was 6,000 to 7,000 vehicles per day, of which about half was heavy vehicles.

At the boundary of the Bacolod city, there are three main entrance/exit points, for Talisay, Bago and Murcia. Large volume of traffic was found along the Bacolod Coastal Road for Talisay and Bago with more than 20,000 vehicles /day each, while that for Murcia was only 4,000 vehicles/day.

As for the traffic inside the Bacolod city, the largest traffic volume of about 35,000 vehicles/day was observed at the survey station on Bacolod Coastal Road(Lacson Street), which is located near the central district of the city. As the trucks are restricted in the area inside the inner circumferential road (North Drive – Lopes Jaena Street – Libertad Strret) during the daytime, traffic is mostly composed of cars and jeepneys.

Regarding the Bacolod – Granada Road, the main street in the east – west direction, the traffic volume varies from 10,000 vehicles/day at the suburb to 19,000 vehicles/day at the Burgos market. This road is characterized by the high composition rate of jeepneys, i.e., about 40 % to 50% of the total traffic.

TABLE 4.2-4 TRAFFIC VOLUME AND VEHICLE COMPOSITION ON MAJOR ROAD (AADT)

(veh/day)

Section	STA.	Road Name and Location	CAR	JEEPNY	BUS	TRUCK	TOTAL
Metro Bacolod	41	Bacolod Coastal Road(South)	2,930	628	1,528	1,730	6,816
		Valladolid-Bago	43%	9%	22%	25%	100%
Cordon Line	42	Bacolod Coastal Road(North)	2,278	226	894	2,824	6,222
		Manpla-Victorias	37%	4%	14%	45%	100%
Bacolod City	43	Bacolod-Murcia-San Carlos City Road	2,016	906	332	926	4,180
		Murcia-Mansilingan	48%	22%	8%	22%	100%
Cordon Line	44	Bacolod Coastal Road(South)	8,258	7,658	1,776	3,026	20,718
		Bago City-Bacolod City	40%	37%	9%	15%	100%
	45	Bacolod Coastal Road(North)	11,136	5,256	1,082	2,840	20,314
		Talisay City -Bacolod City	55%	26%	5%	14%	100%
Bacolod City	24	North Drive-Ramos Avenue	11,862	12,894	484	1,042	26,282
			45%	49%	2%	4%	100%
	25	Bacolod Coastal Road(North)	22,014	12,096	46	518	34,674
		Libertad-Bata	63%	35%	0%	1%	100%
	27	Bacolod Granada Road	10,372	8,104	8	506	18,990
		Lopez Jaena-Lacson	55%	43%	0%	3%	100%
	39	Bacolod Circumferetial Road	6,310	642	70	1,266	8,288
		Jct.Granada-Jct.Mansilingan	76%	8%	1%	15%	100%
	40	Bacolod Granada Road	4,380	5,474	2	484	10,340
		Granada	42%	53%	0%	5%	100%

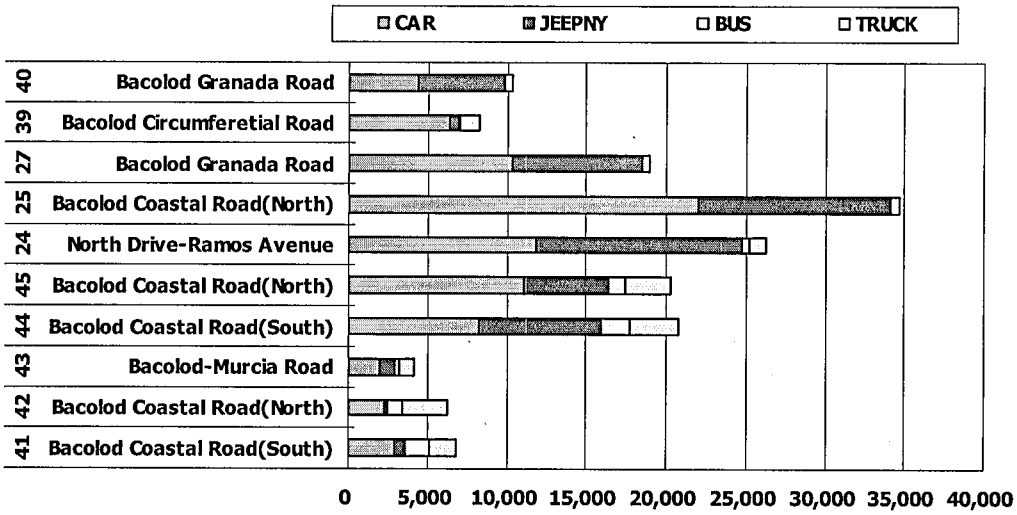


FIGURE 4.2-6 ESTIMATED AADT ON MAJOR ROADS IN BACOLOD CITY

b) Hourly Variation on Major Road

Figure 4.2-7～Figure 4.2-8 express the hourly variations of traffic volume on major road.

Bacolod Coastal Road (Bacolod – Bago)

In general, high traffic volumes more than 600 vehicles/hr. are observed during the daytime from 7:00 a.m. to 7:00 p.m. for both the inbound and outbound traffic to/from Bacolod City.

As for the inbound traffic, four small peaks can be recognized: 8:00～9:00, 10:00 ～11:00, 14:00～15:00 and 18:00～19:00. For the outbound traffic, however, any peak cannot be clearly identified, showing rather flat curve ranging from 600 to 800 vehicles/hr. throughout the daytime. The peak hour ratio to the daily traffic is 7.5%.

Bacolod Coastal Road (Bacolod – Talisay)

The inbound traffic has a morning peak during 8:00～9:00 a.m. and an evening peak during 16:00～18:00, while the outbound traffic has several small peaks during the daytime. Throughout the daytime from 7:00a.m.to 7:00p.m.,the hourly traffic volume is more than 500 vehicles/hr for both inbound and outbound traffic. The peak hour ratio is 7.9%.

Main Roads in Bacolod City

Most of the main roads in Bacolod City have similar characteristics in hourly traffic variation. It is difficult for both the inbound and outbound traffic to identify the peak hour, since there is no big variation in hourly volume during the daytime from 8:00 to 18:00. It may be attributed by the fact that jeepney is mainly used for the trips "to work" or "to school", which might create the morning peak and the percentage share of "private purpose" trips is comparatively high in Bacolod City.

STA.44 Bacolod Coastal Roads (South) Bacolod City- Bago City

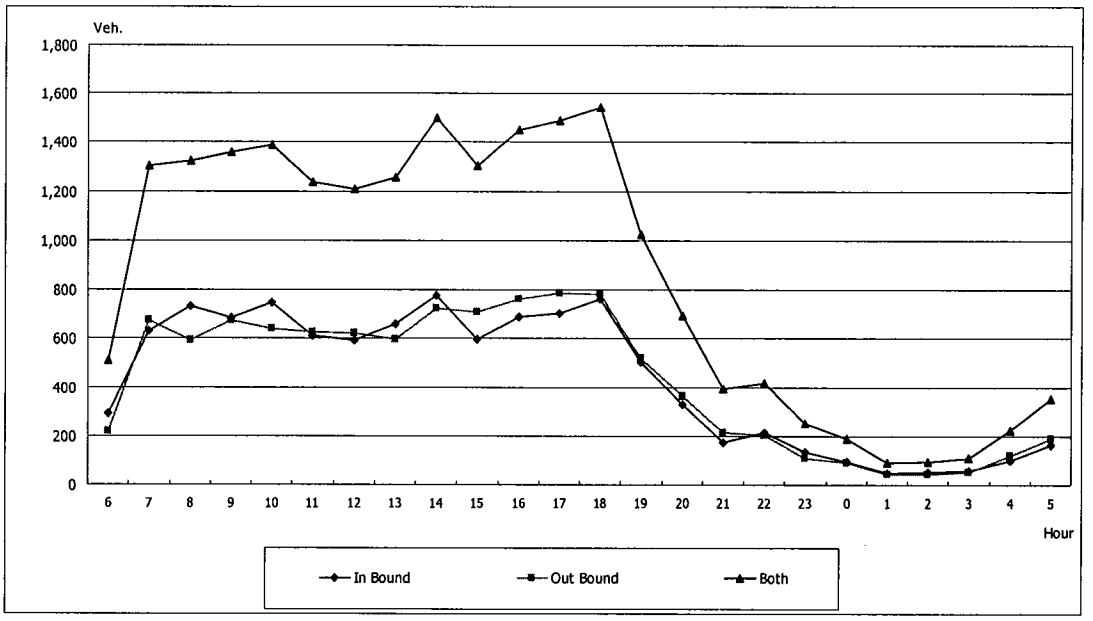


FIGURE 4.2-7(1) HOURLY TRAFFIC VOLUME VARIATION ON MAJOR ROAD (24H)

STA.45 Bacolod Coastal Roads (North) Bacolod City- Talisay City

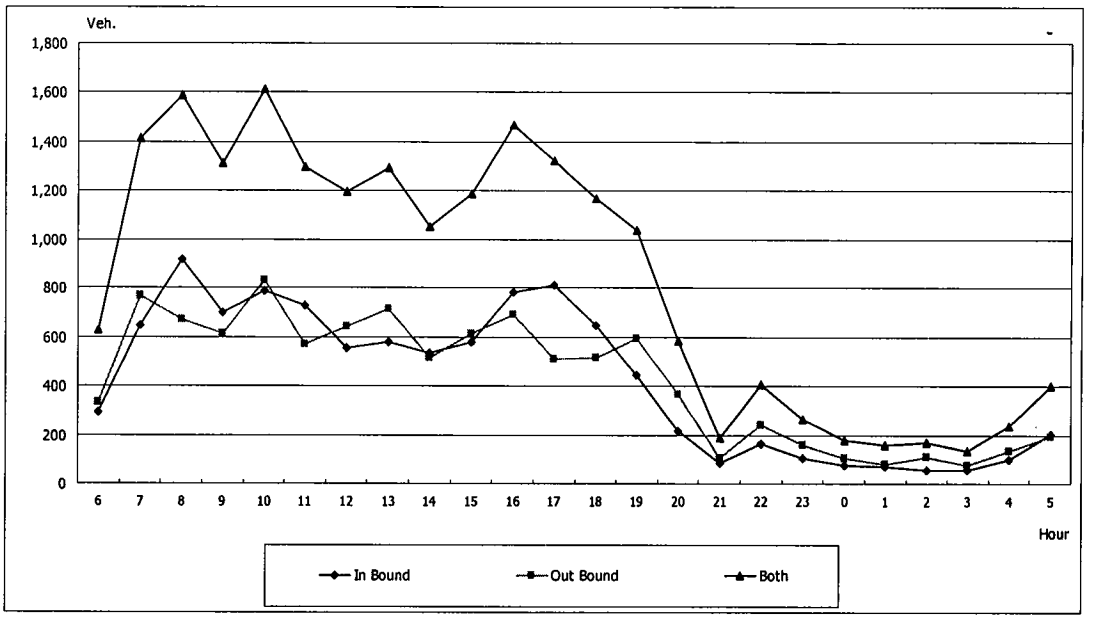


FIGURE 4.2-7(2) HOURLY TRAFFIC VOLUME VARIATION ON MAJOR ROAD (24H)

STA.24 North Drive-Ramos Avenue

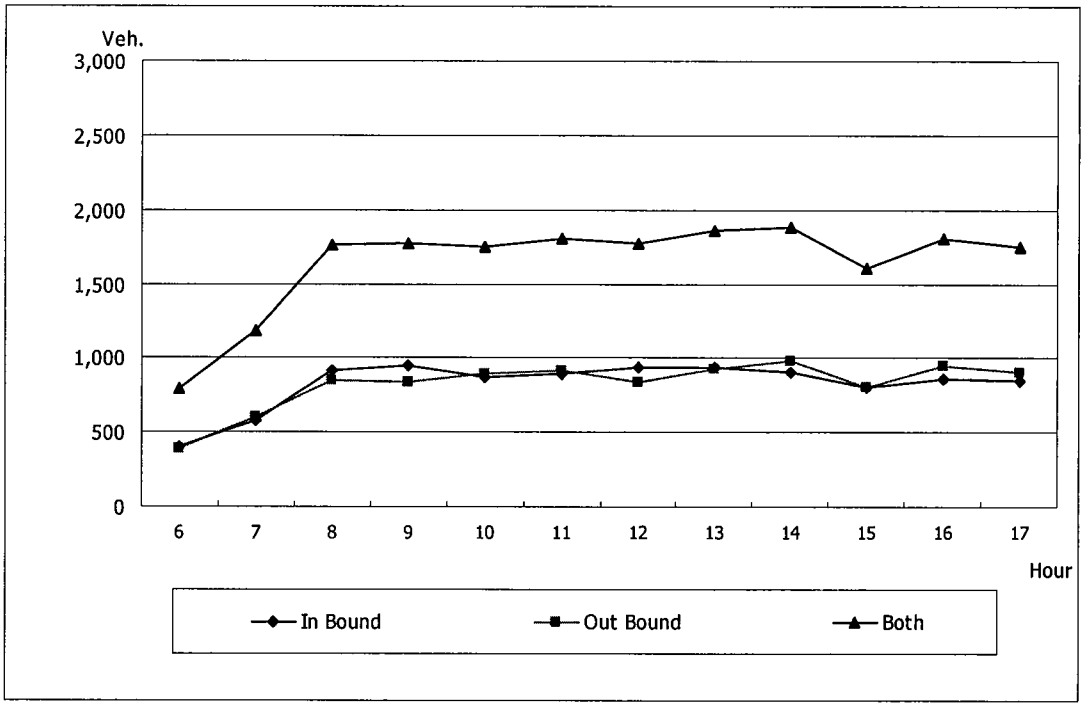


FIGURE 4.2-8(1) HOURLY TRAFFIC VOLUME VARIATION ON MAJOR ROAD IN BACOLOD CITY (12H)

STA.25 Bacolod Coastal Roads (North) Libertad-Bata

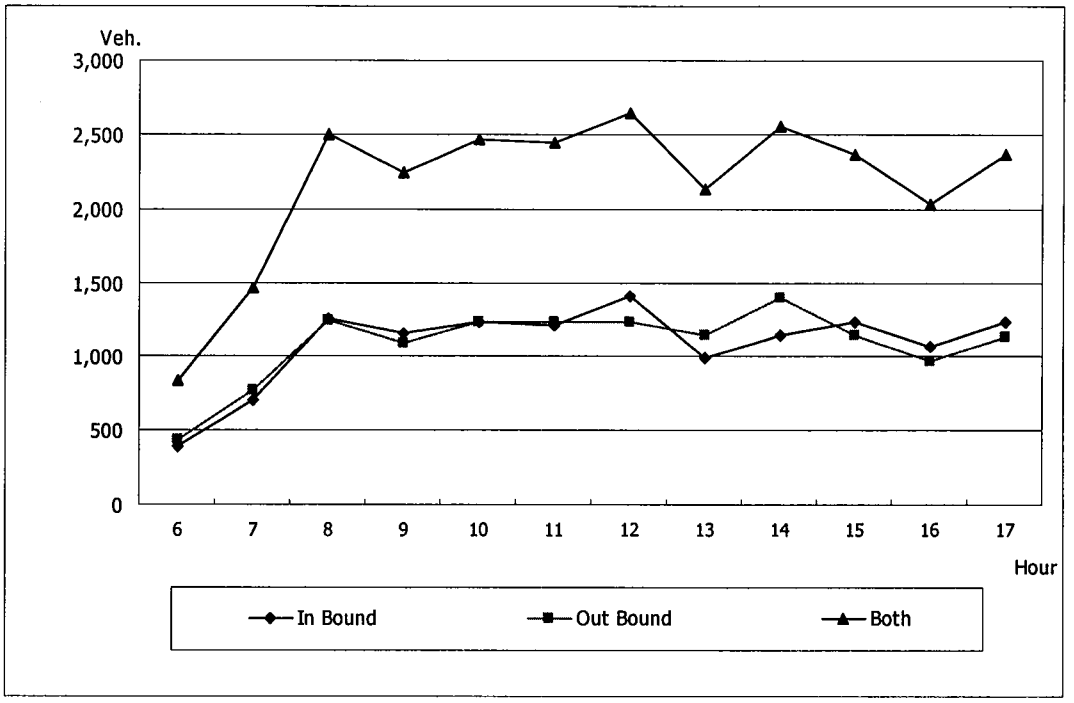


FIGURE 4.2-8(2) HOURLY TRAFFIC VOLUME VARIATION ON MAJOR ROAD IN BACOLOD CITY (12H)

c) Vehicle Occupancy

Average vehicle occupancy is obtained from the roadside OD survey as shown in Table 4.2-5.

TABLE 4.2-5 VEHICLE OCCUPANCY FOR EACH VEHICLE TYPE (PERSON / VEHICLE)

Vehicle Type	Average Occupancy
Car	2.9
Jeepney	10.5
Bus	28.1
Truck	2.2

(Unit: Passenger per Vehicle, including Driver/Co-Driver)

d) Loading Volume

The average loading volume is calculated by using the interview survey results. Among the heavy vehicles, the trucks with four axles have the highest tonnages, approximately 12 tons per vehicle-trip in terms of gross average (including empty trucks).

The overall average loading volume is estimated as 10.8 tons/vehicle in terms of net average (excluding empty trucks) and 4.9 tons/vehicle in terms of gross average taking into account the empty truck ratio of about 55%.

TABLE 4.2-6 AVERAGE LOADING VOLUME FOR VEHICLE TYPE

(ton/vehicle)

Commodity	Pick-up, Van	Truck w/2-axle	Truck w/3-axle	Truck w/4-axle	Average
Agro-Products	1.6	4.8	18.3	23.7	9.7
Manufact'd Products	1.1	4.8	10.8	10.0	4.9
Construction materials	10.7	9.4	18.8	21.4	13.6
Forest,Mining,Mineral	0.3	3.9	13.2	20.1	8.5
Sugarcane		11.5	21.7	23.7	14.2
Container&Empty	0.0	0.2	0.4	1.1	0.2
Average Loading Volume(Gross)	0.3	4.0	11.5	11.9	4.9
Empty Vehicle Ratio(%)	83%	49%	36%	43%	55%
Average Loading Volume(Net)	1.6	7.9	18.0	20.9	10.8

2) Traffic Assignment Result

a) Daily Traffic Volume

Figure 4.2-9 shows the daily traffic volume on the road network in the Metro Bacolod.

In general, the traffic volume is higher, when the location of road section is closer to Bacolod City.

It is also pointed out that the traffic demand is concentrating along the Bacolod Coastal Road, which is the sole trunk road connecting main cities/municipalities in the Metro Bacolod.

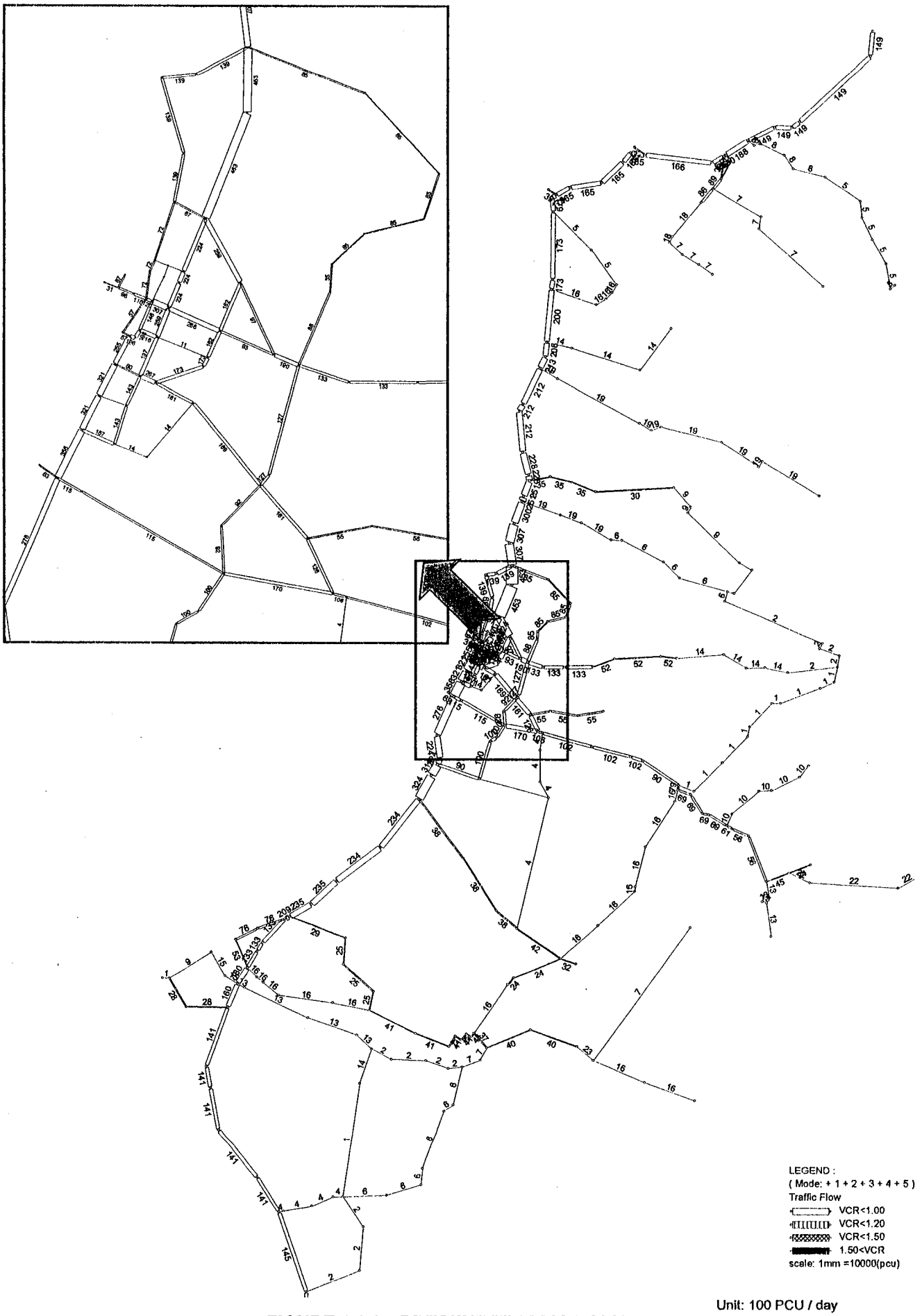
The highest traffic volume of 45,000 pcu/day is found at the entrance point to Bacolod from Talisay on the Bacolod Coastal Road.

There is no road section where v/c ratio is exceeding 1.0, indicating that there is no seriously congested section at present.

b) Average Travel Speed

The travel speed of the each link is shown in Figure 4.2-10 as a result of traffic assignment.

With regard to the Bacolod Coastal Road, the travel speed becomes less than 20km/hr. at the entrance point to the central district of Bacolod city.



Unit: 100 PCU / day

FIGURE 4.2-9 PRESENT TRAFFIC VOLUME

Part-C (Metro Bacolod)

FIGURE 4.2-10 PEAK TRAVEL SPEED

Part-C (Metro Bacolod)

4.2.3 Airport and Port Related Traffic

1) Airport

The current Bacolod Airport is located at the east coast of the Bacolod City. The Bacolod Airport is serving for the flights from/to Manila and Cebu operated by Philippine Airlines (PAL), Cebu Pacific Air (CPA), Air Philippines, etc.

Table 4.2-7 shows the passengers and cargo movements at the Bacolod Airport in the recent five years.

The average number of passengers is estimated at about 1,700 persons/day and the cargo tonnage is about 24 tons/day.

TABLE 4.2-7 PASSENGERS AND CARGO HANDLED AT BACOLOD AIRPORT

Total departure / arrival		1998	1999	2000	2001	2002	Ave.Growth ('98-'02)
Passengers (persons)	Annual Total	454,453	455,199	578,960	533,199	511,108	3.0%
	per day	1,515	1,517	1,930	1,777	1,704	
Cargo (ton)	Annual Total	5,853	6,415	6,268	6,422	7,097	4.9%
	per day	19.5	21.4	20.9	21.4	23.7	

Source: air Transportation Office, Department of Transportation and Communication, Bacolod Airport

The total number of vehicle traffic related to the airport is estimated to be 6,000 vehicles and 1,900 persons per day, based on the traffic counting survey. The main origins/destinations of traffic are illustrated in Figure 4.2-11. Bacolod City is absorbing most of the airport related traffic, accounting for 68% of total traffic.

TABLE 4.2-8 AIPROT RELATED TRAFFIC & PASSENGER VOLUME

Type	Unit	Volume
passenger(a)	persons/day	1,875
car		5,622
jeepney		344
bus	vehicle/day	28
truck		24
total(b)		6,018
vehicle per passenger (b/a)		3.21

Traffic & passenger volume are based on the day of traffic counting survey at the Bacolod Airport.

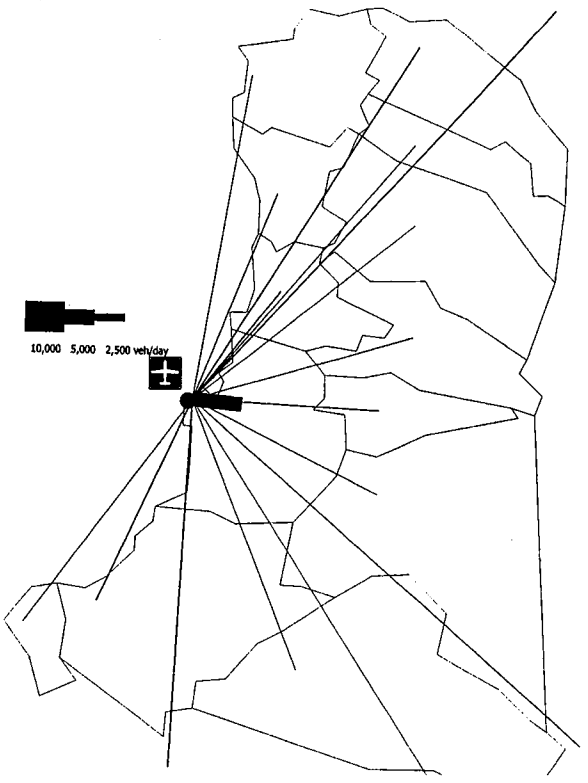


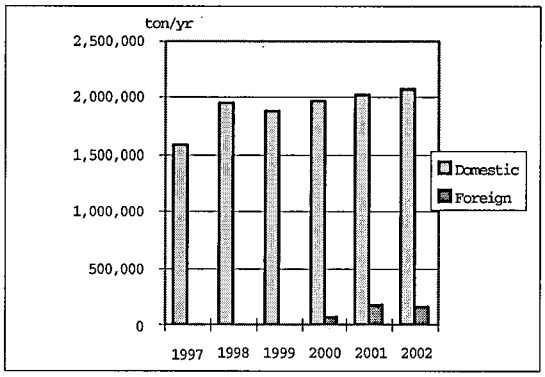
FIGURE 4.2-11 PRESENT TRAFFIC DESIRED LINE

2) Port

There are four main terminals in Bacolod City: Bredco I and Bredco II, Banago and Barcelona.

The first two terminals located at the reclamation area are handling the cargo and passengers for various destinations such as Iloilo, Manila, Mindanao, including overseas operated by various shipping companies, while the third terminal located at the north side of Bacolod City is handling the cargo and passengers for Iloilo and Manila operated by Negros Navigation. The last terminal is handling mainly liquid bulk cargo (petroleum).

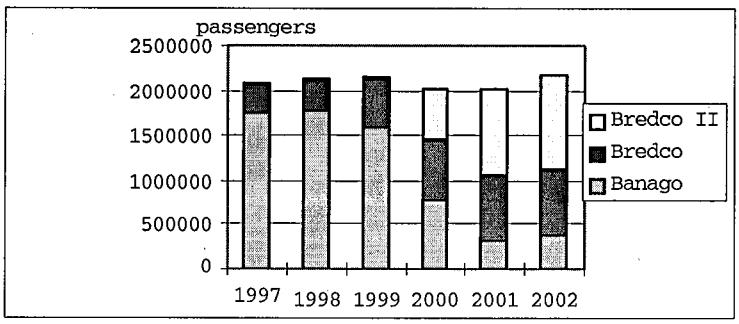
The total tonnage loaded and unloaded at these terminals in 2002 was 2.1 million tons, or about 7,000 tons per day, of which about 66% were handled at Bredco I and II. The total cargo volume once decreased, however, again turned to an increasing trend since the year 2000 when the new terminal at Bredco II was completed. The average growth rate of the domestic cargo during the years from 1997 to 2002 is 5.6% per annum.



Source: Annual Statistical Report, Philippine Port Authority

FIGURE 4.2-12 TOTAL CARGO HANDLED AT BACOLOD PORT

The total number of passengers embarked/disembarked at Bacolod Port in 2002 was approximately 2.2 million per year or 7,200 persons per day. It is obvious from Figure 4.2-13 that Banago had been the busiest terminal in Bacolod until 1999, but has been replaced by the Bredco II after its inauguration in the year 2000.



Source: Annual Statistical Report, Philippine Port Authority

FIGURE 4.2-13 TOTAL NUMBER OF PASSENGERS EMBARKATION / DISEMBARKATION AT BACOLOD PORT

Part-C (Metro Bacolod)

The total number of vehicle traffic related to the Bacolod Ferry port is estimated to be 2,700 vehicle and 6,000 persons per day, based on the traffic counting survey. The main origins/destinations of the passengers are illustrated in Figure 4.2-14. Most of the port related traffic is generated / attracted from/to Bacolod City, making up 63% of total traffic. The total number of vehicle traffic related to the Bacolod Cargo port (Bredco) is estimated to be 3,400 vehicle per day.

TABLE 4.2-9 FERRY PORT RELATED TRAFFIC & PASSENGER VOLUME (BACOLOD – ILOILO FERRY TERMINAL)

Type	Unit	Volume
passenger(a)	persons/day	6,062
Car		2,472
Jeepney		210
Bus	Vehicle/day	0
Truck		58
total(b)		2,740
vehicle per passenger (b/a)		0.45

TABLE 4.2-10 CARGO PORT RELATED TRAFFIC VOLUME BASED ON THE DAY OF TRAFFIC COUNTING SURVEY

Type	Vehicle/day	Share
car	796	23%
jeepney	78	2%
bus	0	0%
truck	2,522	74%
Total	3,396	100%

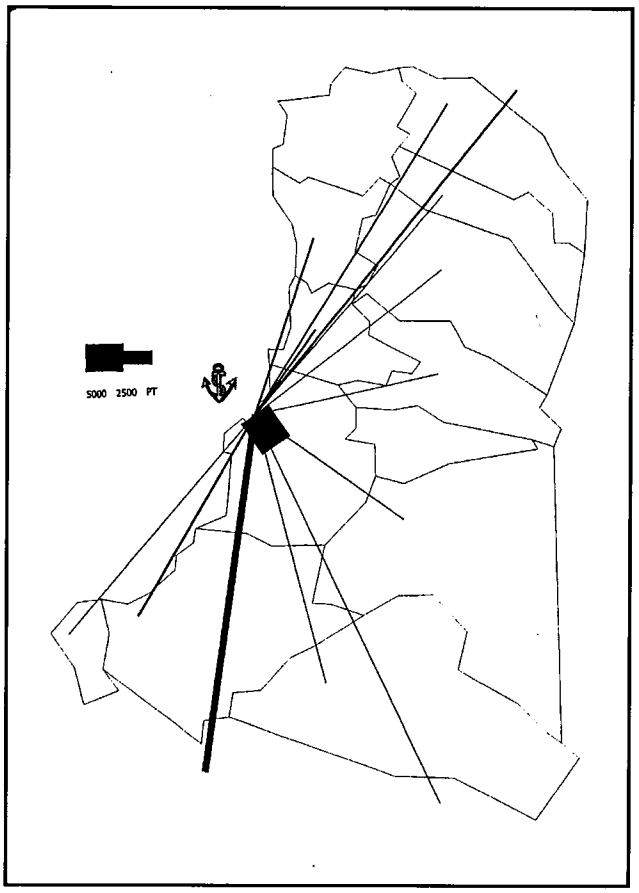


FIGURE 4.2-14 PRESENT PASSENGER DESIRED LINE (Port)

(Unit: Person Trips/day)

4.2.4 BUS/JEEPNEY TERMINALS AND ROUTE

Table 4.2-11 shows the number of arrival and departure as well as on-standby in peak hour with capacity of each bus/jeepney terminal in the Metro Bacolod Area. According this result, most bus/jeepney terminals are able to handle most of present demands of arrival and/or departing buses/jeepneys, except OMC terminal and SDL terminal (both terminals are located at near Libertad Public Market in Bacolod City).

TABLE 4.2-11 CONDITION OF BUS/JEEPNEY TERMINALS

Sta.	Terminal	Peak Hour						Capacity	
		Arrival	VCR	Departure	VCR	Stand-by	VCR	On & Off	Stand-by
1	Ceres North Bus Terminal	15	-	13	-	22	-	4	28
2	Ceres South Bus Terminal	28	-	19	-	12	-	20	135
3	OMC Terminal	58	-	57	-	42	**	10	30
4	Josh Bianc Terminal	13	-	11	-	28	-	4	30
5	Victorias Royal/Rainbow	7	-	8	-	6	-	3	6
6	FILCAB Terminal	2	-	3	-	3	-	1	8
7	SDL Terminal	4	-	2	-	8	***	2	-

Remarks :Volume-Capacity Ratio (VCR) is calculated as follows;
On & Off :Maximum Arrival & Departure in 5 min vs On & Off Spaces
Stand-by :Maximum Stand-by in Any Hour vs Stand-by Spaces
*** : VCR>1.5 ** : VCR>1.2 * : VCR>1.0 - : VCR<1.0

As there are many arrival and departure buses/jeepneys in OMC terminal, they are waiting on the roadside. These waiting buses/jeepneys affect other vehicles.

Though the number of arrival and departure in SDL terminal are not many, buses/jeepneys often wait on the roadside because of not enough terminal spaces. These waiting buses/jeepneys affect other vehicles too.

OMC terminal and SDL terminal shows that stand-by spaces are not enough for maximum demand, therefore it is recommendable that these terminal require expansion of stand-by spaces to increase the road capacity beside terminals

Figures 4.2-15 shows jeepney routes within the central part of Bacolod City. Several routes of those are concentrating on to the particular street in the CBD.

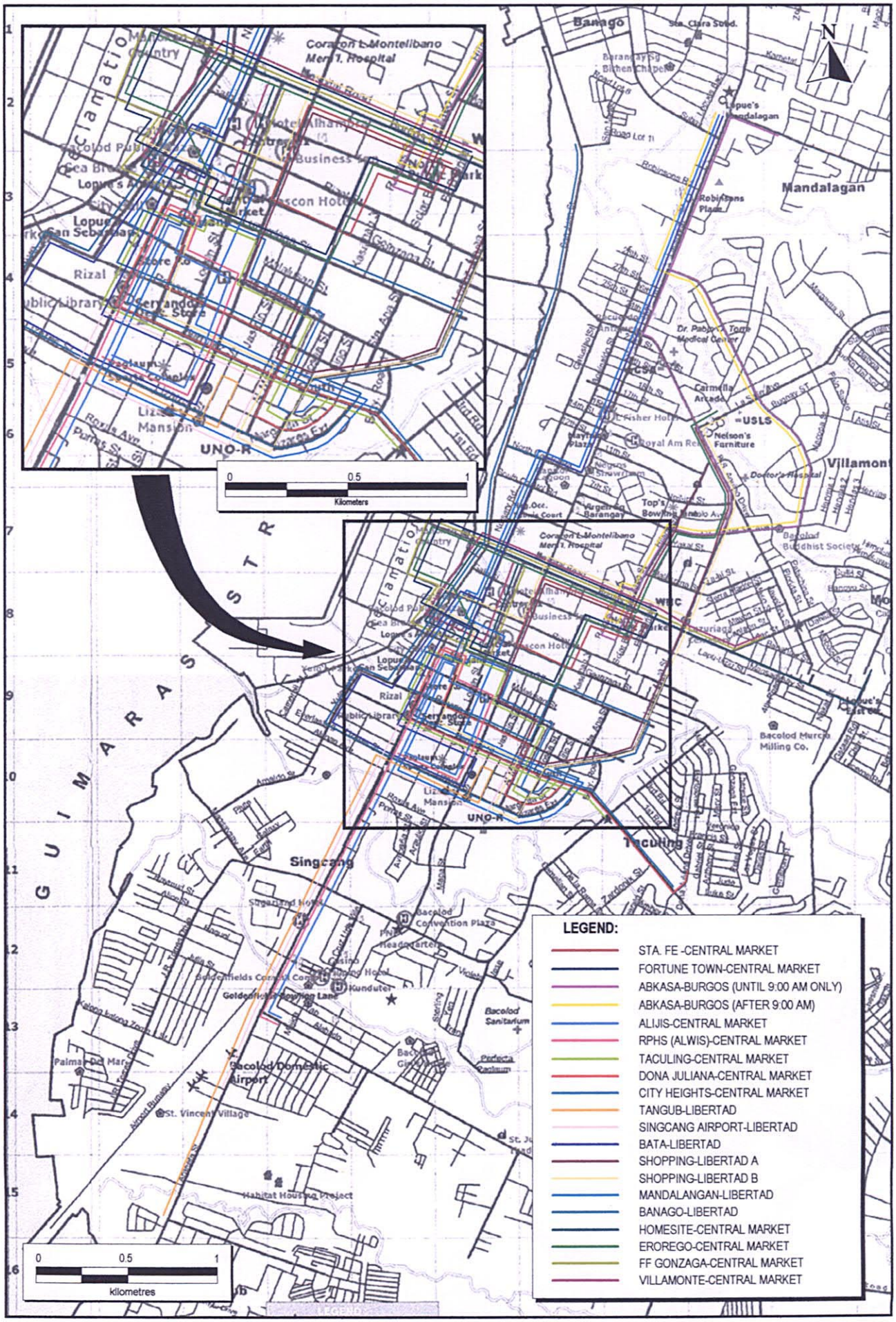


FIGURE 4.2-15 JEEPNEY ROUTES IN THE BACOLOD CITY

4.3 TRAFFIC MANAGEMENT IN BACOLOD AND ADJOINING AREAS

4.3.1 Existing Conditions

1) Road Network

The study area takes a form of rectangular stretched in north-south direction with Bacolod City at the center of western edge facing Guimaras Strait. On the eastern edge are mountains separating eastern and western parts of Negros Island. Many creeks run from east to west toward sea. A national road runs along the shoreline and several cities including Bacolod City locate along the national road. Many local roads branch from the national forming a comb type road network.

In general, the focus area of the study can be divided into four separate areas in terms of traffic characteristics:

- Central area of Bacolod City
- Outer central area
- Suburbs
- Outer city and town area

a. Central Area of Bacolod

The central area has a rectangular shape surrounded by Burgos on the north, Libertad/Hernaez on the south, Lacson on the east and Rizal/Araneta on the west. The grid road network is formed in the area with several roads in north-south and east-west directions. They are closely separated and road density is high. Two national roads, Lacson and Araneta, extend from the central area toward north and south and connect with Talisay, Silay and Victorias Cities in the north and Bago City in the south.

The area is predominantly commercial area with many shops along both sides of the roads. Bacolod Central Market locates at the center of the area where one of the jeepney terminals in the city is found. One-way system is introduced to some of the roads.

b. Outer Central Area

Central area is surrounded by outer central area on all sides except the west which is a reclaimed land yet to be developed. The area is mixed with commercial and residential use near the central area. Further outside, there are numerous subdivisions with several landmarks such as educational institutions, hospitals, bus terminals, and markets.

New shopping malls, Gaisano City along Araneta in the south and Robinson's Place along Lacson in the north opened in recent year. Other commercial establishments stand along four arterial streets, Lacson, Burgos, Libertad and Araneta, all of which stretch toward outside of the city.

Two local markets, Burgos Market and Libertad Market, are also located in the area and three bus terminals, Ceres Bus Terminal, Ceres South Terminal and Murcia Terminal, serve as transfer point of inter-city and inter-city public transport. Ceres North Terminal no longer exists.

Semi-grid network is formed in the out central area with some alleys of dead end. B. S. Aquino Drive runs diagonally in northwest southeast direction and links Lacson and Burgos serving as shortcut for traffic between northern and eastern parts of Bacolod City.

Roads in subdivision take typical formation found in other cities in the Philippines. Limited number of access roads connects subdivision with outside main street and grid or radial and circular road network is formed within the subdivision.

c. Suburbs

Outside of the outer city center expands vast area of suburbs, mostly used as sugar cane field. Lacson and Araneta run along shoreline and form a backbone, from which local roads extend to east toward mountain areas. Thus the road network has a comb type structure. There is no direct link between these local roads so that traffic concentrates on the national road.

Proposed new Bacolod Airport locates in sugar cane field in Silay City.

d. Outer Town Areas

There are four small cities in the study area, Talisay, Silay and Victorias Cities in the north and Bago City in the south. National road penetrates these cities. A shortcut was constructed bypassing Bago City. Thus no through traffic passes through there. There is no such bypass for other cities and through traffic passes through city center mingling with local traffic.

2) Intersections Layout

Intersection is a place where conflicting movements share the same space. Road capacity is often limited by the capacity at intersection. Thus the operation at intersection is critical for smooth and safe traffic movement. Comments relating to the layout of intersections are highlighted as follows.

a. Uncontrolled / Priority / Give Way

The priority / give way intersection is the basic intersection type when two or more roads connect and is the predominant intersection type in the study area. General characteristics of existing intersections are:

- Many intersections are formed by intersecting roads without traffic engineering design
- Priorities are not defined on the approaches
- Lane line is not drawn at approaches and no turning direction is designated
- Large undefined areas with irregular traffic streams
- Relies on traffic taking avoiding action to avoid collisions
- Lack of left turn pockets results in delays to through traffic movements
- Sidewalk is not provided at many intersections in suburbs and movement of vehicle and pedestrian is not segregated

b. Roundabout

There is no roundabout in the study area. However, some intersections have an object at the center. For example Hilado – 6th (Narra), and Lopez Jaena – 6th (Narra) intersections have an electric pole at the center. Traffic movement at these intersections is irregular; some vehicles go around the pole like the movement at roundabout while others take shortcut like normal intersection. Another intersection at Bacolod Murcia - Libertad Extension has a guide sign at the center but it operates like a normal T-shape intersection.

c. Signalized Intersection

Conflicts between opposing traffic streams are regulated by traffic signal which defines the use of the intersection for conflicting movements. There are six traffic

signals in Bacolod City and four of them are working. No signals in other parts of the study area.

- Working signals are of multi pattern signal which operate with different timing according to the time of day
- No vehicle detector for actuation control is used
- Improper phasing is adopted at two intersections. Green signal is indicated twice for the same direction in a cycle
- Lane line and directional arrow are not provided for the separate operation of movements
- Modern traffic engineering principles such as lane widening and left turn lane not applied

3) Traffic Operation

a. Traffic Volume Count

Traffic volume count survey was conducted at 48 survey stations throughout the study area. 24-hour count was conducted at 8 locations while the 12-hour count was conducted at the remaining 40 locations.

The central area is surrounded by outer central area and has numerous access roads. It is thus difficult to count the total number of vehicles that enters to or exit from the area. Instead, traffic volume on major streets in the area was counted. Traffic volume for 12 hours in vehicles is shown in Figure 4.3-1. Two main streets in the area, Araneta and Lacson show high traffic volume. In fact the traffic volume of 27,422 vehicles for 12 hours at Araneta is the highest in the study area.

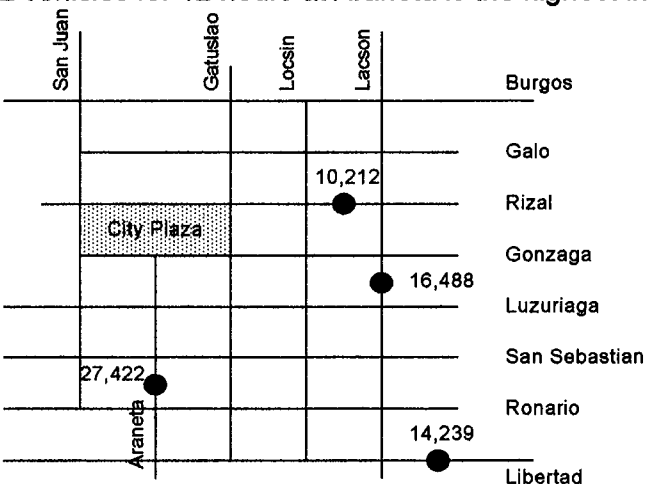


FIGURE 4.3-1 TRAFFIC VOLUME IN CITY CENTER

Traffic volume count in the outer central area is shown in Figure 4.3-2. The survey results suggest that there is large demand from the north and south than from the east. Aquino Drive and Lopez Jaena function as bypass around the central area. In contrast, the traffic volume along circumferential road is still small.

FIGURE 4.3-2 TRAFFIC VOLUME IN OUTER CENTRAL AREA

Traffic volume in the suburbs is shown in Figure 4.3-3. Main traffic flows in the suburbs is in the direction to and from Bacolod City and traffic volume decreases as survey station becomes farther from Bacolod City. Exception is the station No. 2 located on the national road between Bago and Pulupandan. The volume increases slightly.

Traffic volume between Bacolod and eastern towns of Murcia and Granada is smaller than traffic in north-south direction. Traffic to and from Granada is larger than that with Murcia. But this may be because of the survey location. Traffic volume on Bacolod – Granada Road is counted just outside of Circumferential Road and there are subdivisions located on that road outside of Circumferential Road.

The traffic volume on local roads in east-west direction is small.

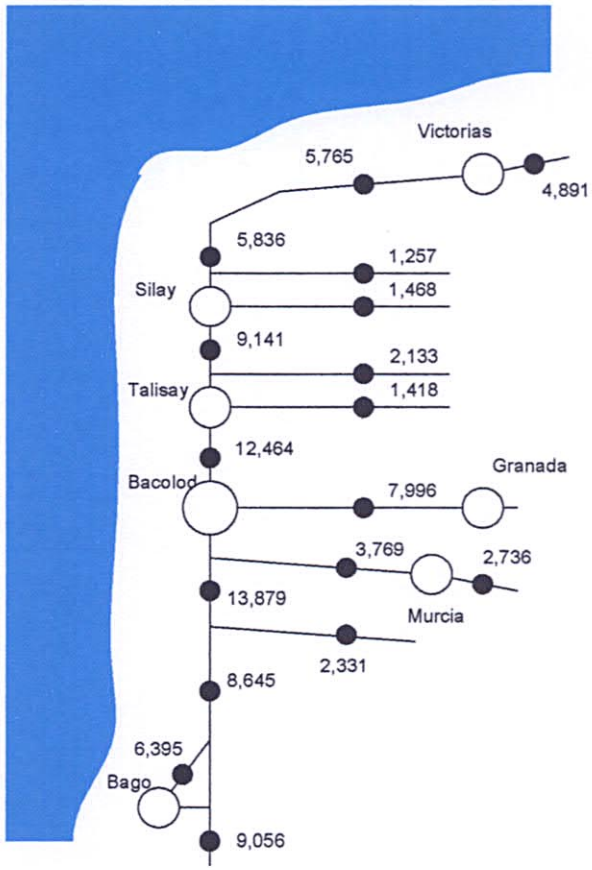


FIGURE 4.3-3 TRAFFIC VOLUME IN SUBURBS

b) Vehicle Composition

In general, public transport is the primary measures in the Philippines. In Metropolitan Bacolod study area, jeepney and tricycle are key transport for the residents and there is no intra-city bus service. Hence traffic count records show the high share of these two modes. According to the traffic volume count survey conducted by this study, the locations listed in
Table 4.3-1 are the highest ten location of jeepney share. All locations except Station Nos. 28, 24 and 31are located on the roads that connect Bacolod with outer city and town areas. Station Nos. 24 and 31 are on the roads that circumvent the city center, while Station No. 28 is on the main access road to Central Market. Naturally all high jeepney share locations are on the jeepney route.

TABLE 4.3-1 LOCATION WITH HIGH JEEPNEY SHARE

	Sta.	Location	Share	Volume (12h)
1	32	Libertad	75.8%	14,239
2	29	Araneta (Hernaez – Luzuriaga)	73.4	27,422
3	28	Rizal (Lacson – City Plaza)	55.2	10,212
4	40	Bacolod-Granada near Circum.	50.2	7,996
5	24	Aquino Drive (Hilado – Lopes Jaena)	48.3	19,147
6	31	Lopez Jaena (San Sebastian -)	43.2	12,250
7	27	Burgos (Lopes Jaena – Lacson)	42.8	14,631
8	21	San Juan (Aquino – Circum.)	42.3	8,326
9	23	Lacson (Aquino – Circum.)	42.1	21,260
10	35	Bacolod – Murcia	37.9	7,787

On the other hand, tricycle is more prominent in rural area. The table below shows ten highest tricycle share locations. Two locations, Station Nos. 26 and 38, are located in Bacolod City but they are far from the city center. Other counting stations are outside of Bacolod City. Traffic volume of these locations is small.

TABLE 4.3-2 LOCATION WITH HIGH TRICYCLE SHARE

	Sta.	Location/Street	Share	Volume (12h)
1	12	Estado - Victorias	72.5%	1,193
2	7	Busay – Canitum	70.1	539
3	3	Alegria – Napoles	62.0	1,459
4	38	Cabug	61.7	869
5	16	Eustaquino Lopez – Silay	51.6	1,257
6	17	Airport – Silay	42.2	1,468
7	26	Circumferential Road	41.3	6,917
8	20	Concepcion – Talisay	40.7	1,418
9	9	Talogtog – Sum-ag	36.3	2,331
10	11	Mambucal - Murcia	35.3	2,736

Sugar cane is a major industry in the Province of Negros Occidental. Trucks are used to carry sugar cane from field to factory. Thus share of sugar cane trucks is high at certain roads. The following table shows the road where share of sugar cane truck is higher than 10 percent. Station Nos. 13a and 13b are located on the private road leading to Victorias Milling Corporation, the largest sugar cane factory in the country. All stations except No. 42 are located on the road connecting sugar cane field to the national road along the coastal line. Station No. 42 is located on the national road east of Victorias, which is also a major access road to sugar cane factory.

TABLE 4.3-3 LOCATION WITH HIGH SUGAR CANE TRUCKS SHARE

	Sta.	Location/Street	Share	Volume (12h)
1	13a	Highway - CVMC	58.3%	751
2	19	Efigenio, Lizares	19.3%	2,133
3	16	Hacienda Adriana	14.2%	1,257
4	12	Estado - Victorias	13.7%	1,193
5	42	Hacienda Cristina	13.5%	4,891
6	17	Airport - Silay	12.1%	1,468
7	13b	Highway - CVMC	10.8%	4,120

4) Operation at Intersections

There are four main intersection types categorized by their operating characteristics. Findings through the observation of traffic operation at the intersection are presented hereunder for each type of intersection.

a. Uncontrolled / Priority / Give Way

Typical intersection forms are T-intersection or cross-roads and are the simplest form of intersection when two roads join. The general traffic rules require vehicles to give way to the right unless on the priority road. General characteristics of existing intersections are:

- Traffic enters in a free-for-all manner
- System works on a first come first served basis
- Vehicles enter the intersection even exit is not clear and stays within intersection blocking other flows

- Jeepneys tend to stop just before or after the intersection for loading and unloading
- Multiple paths of crossing vehicles increases congestion and risk, while reduces capacity

b. Roundabout

There is no regular roundabout constructed as such in Bacolod area but a few intersections have an object at the center. The traffic operation at these intersections is irregular as stated earlier.

c. Signalized Intersection

Conflicts between opposing traffic streams are regulated by defining separate time periods for opposing streams.

- Vehicles generally observe the signals
- Overlapping phase sequence is adopted to handle unbalanced left turn traffic but phase sequence is wrong at two intersections as explained later
- Left turn movements cut across opposing traffic stream
- Vehicles turning left take any available route creating multiple conflicts and unregulated traffic stream which disrupts the opposing traffic stream

Adequateness of the signal timing plan and use of manual control are not confirmed due to the limited time of observation.

5) Bottleneck and Congested Street

Based on the observations during the reconnaissance tour of the study area, hearing with the local officials and the reports of the previous studies, the bottleneck points in the city, where queue is often created, are identified as shown in Table 4.3-4 and Figure 4.3-4.

TABLE 4.3-4 LIST OF CONGESTED LOCATIONS

		Remarks
1	Lacson – B. S. Aquino Drive intersection	Signalized
2	B. S. Aquino Drive – La Salle Ave. intersection	Not signalized
3	Lacson - Burgos intersection	Signalized
4	Burgos – Hilado intersection	Not signalized
5	Burgos – L. Jaena intersection	Not signalized
6	Burgos – Circumferential Road intersection	Not signalized
7	Lacson – Hernaez intersection	Signalized
8	Gatuslao – Rizal intersection	Not signalized
9	Araneta – Luzuriaga intersection	Not signalized
10	Luzuriaga – Gatuslao intersection	Not signalized
11	Araneta – Lizares intersection	Not signalized
12	Libertad Extension – Taculing Road intersection	Not signalized
13	Araneta – Magsaysay Ave. intersection	Not signalized

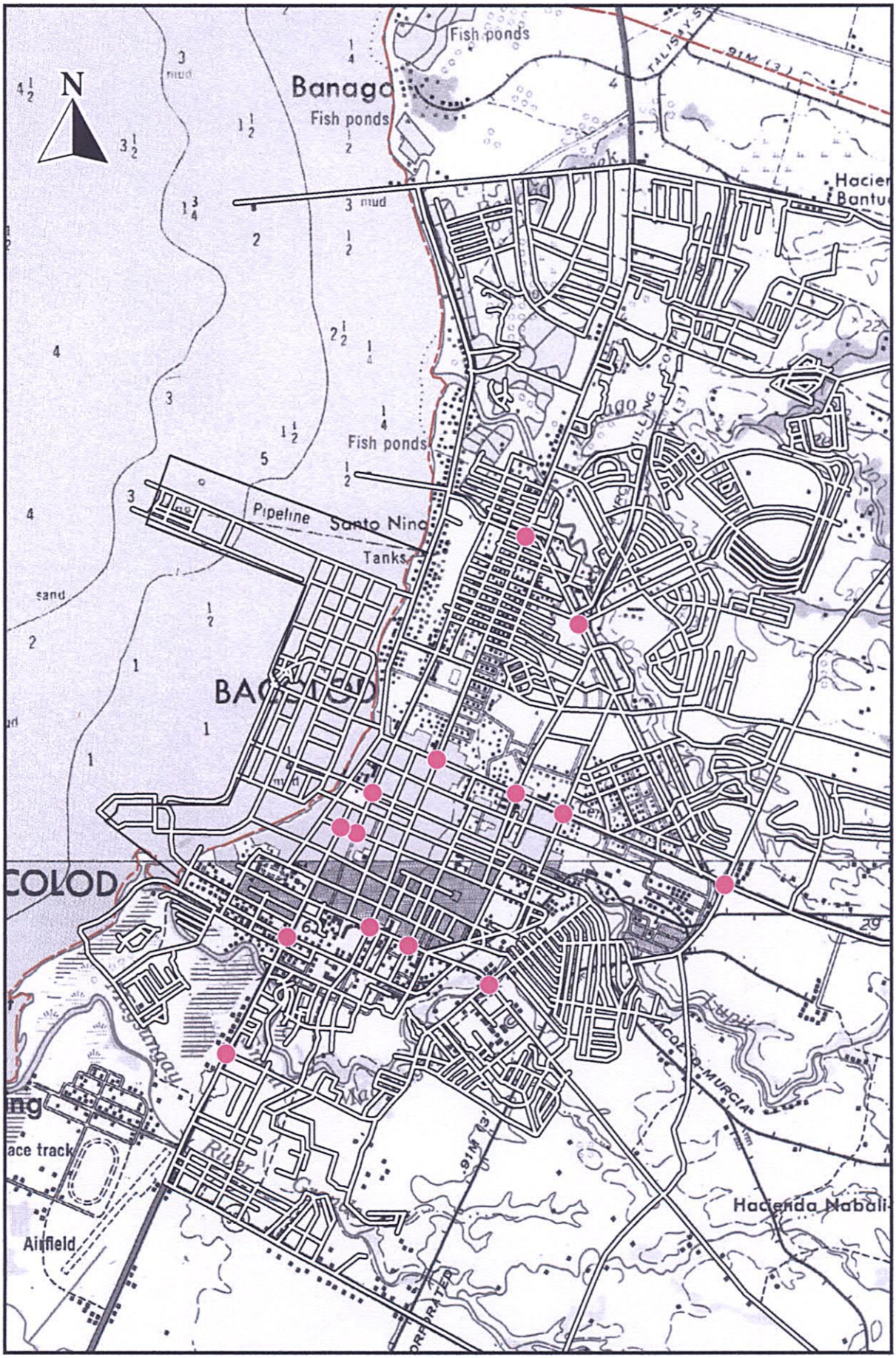


FIGURE 4.3-4 CONGESTED LOCATION IN BACOLOD CITY

Congestion in Bacolod City is not caused by the excessive demand over physical capacity of road or intersection. It is rather an operational problem. There are four major causes of congestion. The congestion at bottleneck point can be attributed to any of these causes or their combination.

- Parked car and parking maneuver
- Loading and unloading activity, taking over maneuver and waiting at on-street terminal of jeepney
- Competing vehicles of conflicting movement at intersection where signal is warranted but not installed
- Vehicles entering intersection even when exit is not clear causing block of vehicles in other directions

There is almost no standard no-parking sign. Thus it is not clear whether parking is prohibited or not for a particular section of road. Many sidewalks in the city center are converted to parking lots and even sidewalk not for parking is often occupied by vehicles as temporary parking place. Besides traffic police currently does not enforce no-parking regulation. All of these facts have led to an uncontrolled parking practice causing high resistance to the traffic flow.

FIGURE 4.3-5 PARKING CONDITION IN BACOLOD CITY

Unique feature of jeepney is that it stops anywhere for loading and unloading. Although such activity is prohibited near intersection, jeepney is still a big obstruction to the smooth flow. In spite of small passenger carrying capacity, loading and unloading of jeepney takes long time due to its structure. It has only one opening at rear and boarding is possible after alighting. The roof is low so that passengers have to stoop.

Swerving action to left lane by jeepney to take over jeepneys in front of it often disturbs the flow on the left lane causing instant bottleneck. Jeepneys waiting at on-street terminal also reduce the capacity of the road and contribute to the congestion.

In Bacolod City, there are two intersections where signal is not working. In addition, there are also intersections where signal is warranted but not provided. Such intersections operate on a first-come-first-served basis and easily get tangled. Traffic police or traffic aide is assigned to these intersections for manual control of traffic flow. But they are much less effective than signal. Manual control is also often interrupted when they engage in other duties or take rest.

4.3.2 Traffic Control and Management Facilities

1) Signal Systems

There are a total of six traffic signals in Bacolod City and no signal exists in other cities and towns. Four of them are functioning after the repair work undertaken last year. A Bacolod based company called Alta Negros Industrial Supply Corporation did the repair work of the signal controller. They are currently in charge of the maintenance of these signals.

Alta Negros Corporation supplied six units of traffic signals in August 2002. These signals are in warranty period until August 2003. After August, a maintenance contract is expected to be made. The company has an engineer who worked for traffic signal system in Saudi Arabia so that they are capable of installing and maintaining signals.

Before signals were replaced, there were malfunctioned old signals of Econolite of USA. Alta Negros contacted Econolite and found that repairing the signal is costly and impractical as spare parts are already out of stock and not available for the outdated signal. It was more economical to replace old signal with a new unit. The company installed multi pattern signals made by Siemens of Germany. Because the price of Siemens signal was cheaper that that of Econolite. A signal in Iloilo City at Gen Luna and Diversion Road intersection was also supplied by Alta Negros. It is in observation period and contract with Iloilo City has not been made.

TABLE 4.3-5 TRAFFIC SIGNALS IN BACOLOD CITY

	Street 1	Street 2	Status
1	Lacson	Aquino Drive	Working
2	Lacson	Burgos	Working
3	Lacson	Galo	Not working
4	Lacson	Rizal	Working
5	Lacson	Libertad	Working
6	Araneta	Hernaez	Not working

Wrong phase sequence is found at two signals, Araneta – Aquino Drive and Araneta – Burgos intersection. Overlapping phase sequence is adopted but the sequence is wrong. Green signal is shown twice within a signal cycle for the same movement as shown in 4.3-7. The correct overlapping phase sequence, in which Phase No. 3 and No.4 is interchanged, is shown in the same figure.

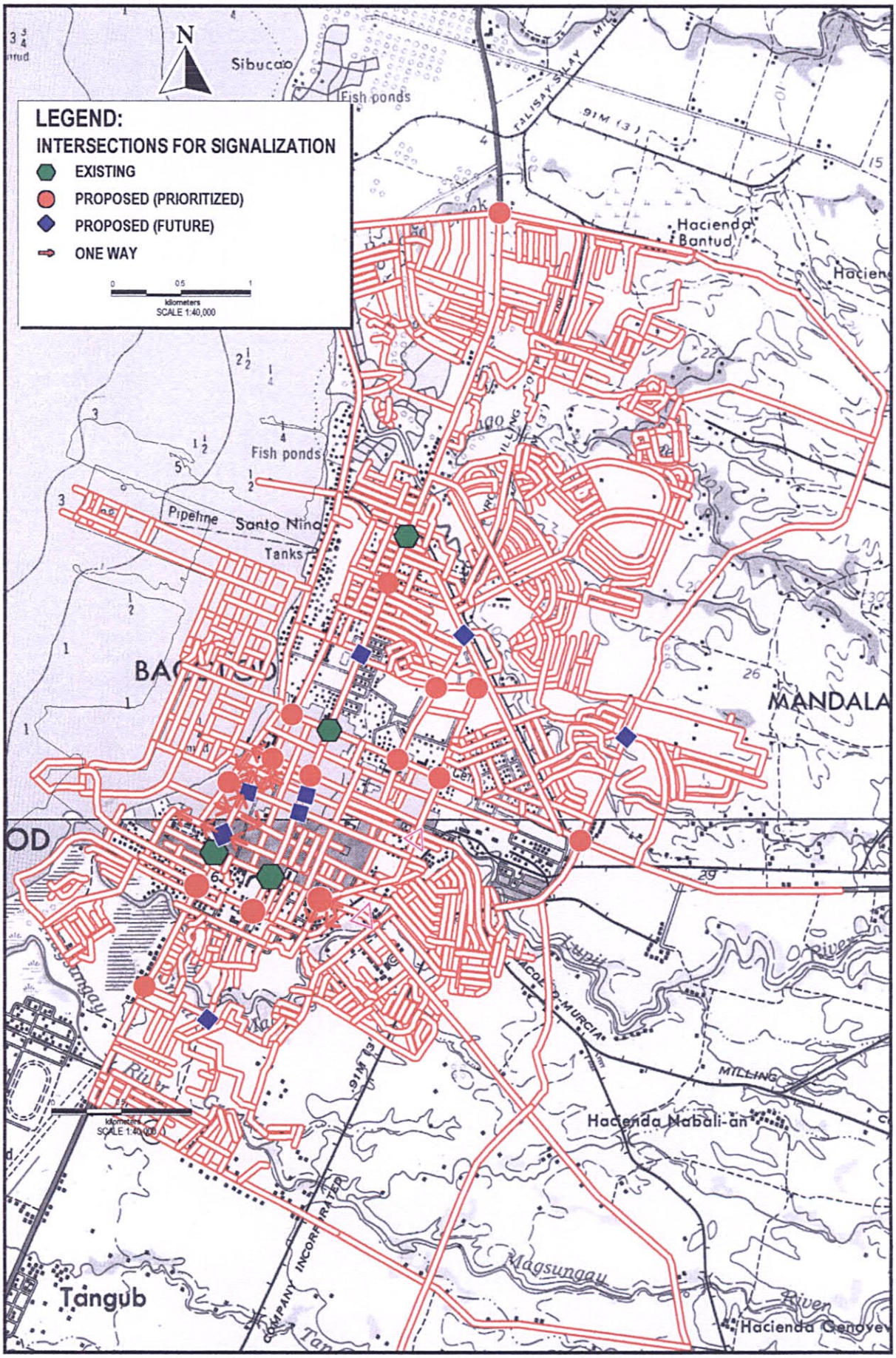
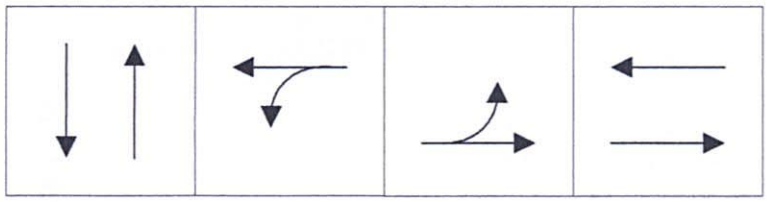
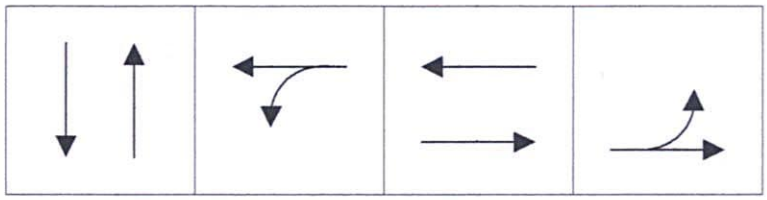


FIGURE 4.3-6 MAP OF EXISTING TRAFFIC SIGNAL LOCATION



(a) Existing wrong phase at Araneta - Burgos



(b) Recommended correct phase at Araneta - Burgos

FIGURE 4.3-7 WRONG AND CORRECT PHASE SEQUENCE

Although Alta Negros is capable of changing phasing and adjusting timing, they are not in charge of phase sequence design and signal timing calculation. They simply implement what is told to apply. Signal design must be undertaken by City Engineer's Office. Thus City Engineer's Office must instruct the contractor to rectify the incorrect phase sequence pointed above immediately.

Traffic Engineering Center of DPWH once conducted a survey of the traffic signals in Bacolod City. They prepared design plans and cost estimate to rehabilitate the signal system in November 2001.

2) Traffic Signs and Pavement Markings

There is very few traffic sign of standard design in the study area. Makeshift painted sign is instead used. Besides, the number of traffic signs is scarce; hence traffic regulation in force is hard to know. For example, a painted rectangular column with "No Left Turn" message is placed at the center of Burgos - Lopez Jaena intersection indicating no left turn from all approaches. It is not clear whether the signboard is removed or not during the night. If not, it would become a traffic hazard during dark hours.

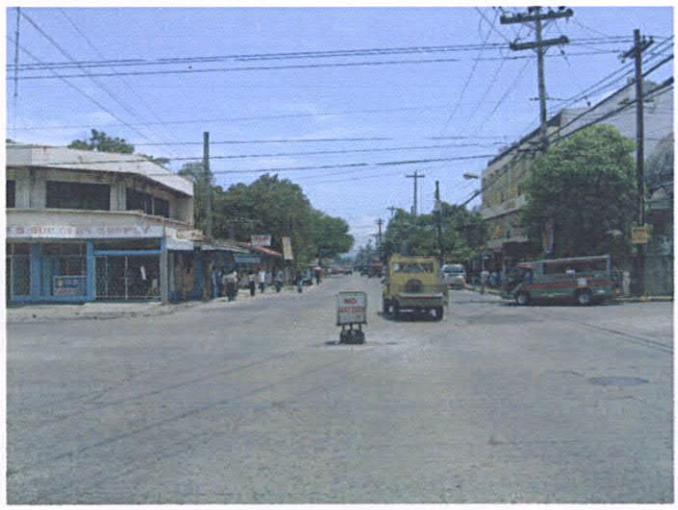


FIGURE 4.3-8 "NO LEFT TURN" SIGNBOARD AT INTERSECTION

Pavement marking is likewise poorly provided. Centerline is drawn along major roads but most of them are faded out. Pedestrian crossings are provided to a number of intersections. Among them, pedestrian crossing marking across Araneta Street in front of City Hall is still in good condition. Besides it is wide to accommodating many pedestrians there. Directional arrows are found at few intersections but at wrong location in wrong color. Lane line and stop line are non existent. In summary, some intersections are provided reasonably with centerline and pedestrian crossings while others have no markings at all creating a wide open space at intersection.

Sidewalk curb near the intersection is painted in yellow/black zebra at some intersections to indicate probably no loading and unloading zone of public utility vehicles, or no stopping near the intersection. Although it is not specified in the national standards, the marking is a good practice if it is properly understood by road users.

As described above, the design and layout of the existing markings do not conform to the DPWH standards. A word "STOP" is painted on the pavement instead of stop line at Araneta – Luzuriaga intersection. Many markings that must be in white according to the standards are pained in yellow. Arrow symbols are, where exists, in yellow and placed after the pedestrian crossing.

Other devices such as delineator, hazard warning reflector and so forth are not found.

3) Median and Island

Median is constructed at few locations like B. S. Aquino Drive, and a section of Hilado, 6th Street and Araneta Street, for example. Some roads are wide enough to construct median but no median is provided. Even median at approach like one at east approach of Araneta – Burgos intersection is effective to prevent vehicles from taking the lane for opposite direction at intersection approach.

A central island is constructed at one corner of City Plaza at Gatuslao – Gonzaba intersection to guide traffic. Two incoming one-way streets meet from the opposite direction and diverge to two outgoing one-way streets there. Such island is necessary and effective at other three corners of the City Plaza, and other locations.

4) Left Turn Bay

Left turn bay is provided to B. S. Aquino Drive – La Salle intersection and Araneta – Murcia intersection. It is effective to prevent left turning vehicles from blocking through traffic. There are other intersections, however, where left turn bay is effective and road is wide enough but currently not provided with left turn bay.

FIGURE 4.3-9 LEFT TURN BAY

Imaginary (painted) left turn bay is drawn at an intersection along Araneta Street in Bago City. The marking may be less effective than physical median. Nonetheless, it would be helpful in guiding traffic.

FIGURE 4.3-9 IMAGINARY (Painted) LEFT TURN BAY

5) Jeepney Bay

Jeepney bay separated by barrier is constructed in front of Robinson's Place along Lacson. The bay is effective in eliminating the potential bottleneck created by the loading and unloading activity of jeepneys.

FIGURE 4.3-10 JEEPNEY BAY

Separate jeepney path is also constructed on the other side of the road.

FIGURE 4.3-11 SEPARATE JEEPNEY PATH & PEDESTRIAN OVERPASS

6) Pedestrian overpass

Pedestrian overpass is constructed at only one location along Lacson in front of Robinson's Place.

7) Intersection Improvement

There is no clear sign of geometric improvement works undertaken in the past at intersections. Many intersections are too wide and provide too much flexibility to vehicles, while vehicles and pedestrians mingle due to lack of sidewalk.

FIGURE 4.3-12 TOO WIDE INTERSECT WITHOUT CLEAR SIGN

4.3.3 Parking Management

Bacolod City does not have parking management policy. No on-street parking regulation is applied to some sections of main roads. But there is no clear guidelines how to apply the regulation nor list or map of no-parking sections. Section IX of the draft City Ordinance stipulates that "Parking is strictly prohibited at the designated loading and unloading zones." The draft Ordinance does not have other sections related to parking. According to Traffic Police, section or clause on parking regulation will be added in the final version of the Ordinance.

There is also no city ordinance that sets forth parking space requirement to be met when a building permit is issued for a new building. City Planning and Development Office recognizes, however, the necessity of such regulation and is contemplating to create the regulation.

4.3.4 Traffic Management Organizations

The highest governing body for traffic management in Bacolod city is Bacolod Traffic Authority (BTA). It was established and its component office Bacolod Traffic Authority Office (BTAO) was created as per the City Ordinance No. 230, Series of 1999. The organizational structure of BTAO is defined by the City Ordinance No. 315 dated December 5, 2002. As per the Ordinance, the BTA Council comprises 12 members including not only government agencies but also private sectors representing civic and business sectors, driver's organization and transport sector.

BTAO consist of Traffic Enforcement Section, Traffic Technical & Engineering Section and Traffic Education & Information Section. Not all positions are filled as of now as BTAO Ordinance was legislated on December 5, 2002.

Bacolod Traffic Police has total staff of eight policemen and 120 traffic aides. All traffic aides but two persons are deployed to the key intersections and other congested road sections. Traffic Police has one vehicle, ten motorcycles and ten units of handheld radio communication equipment. In addition, some traffic aides have their own portable radio tuned to the frequency of police radio system.

Traffic aides are deputized by Philippine National Police (PNP) and Land Transportation Office (LTO) so that they can apprehend traffic regulation violators.

Traffic aides are contractual employee on a three month basis. Such employment system is detrimental to the professional service of traffic aides. A city ordinance is being prepared to make them regular employee.

4.3.5 Traffic Related Laws and Regulations

1) Introduction

There are several ordinances legislated in the past. Some of them are too old and others are not consistent with the practice being taken. For example, parking is allowed by Ordinance along Araneta between Gonzaga and Luzuriaga. In reality, parking is banned there as the location is intended for on-street terminal for jeepneys. A new ordinance is being prepared, in which regulations on all aspects of traffic management will be stipulated.

Another defect is that there are virtually no traffic signs that indicate traffic regulation in force. In fact only two traffic signs of standard design using reflective sheet were found during three-day reconnaissance tour of the study area.

TABLE 4.3-6 LOCAL REGULATION ON TRAFFIC MANAGEMENT

Type	No.	Series	Title	Date
OR	315	2002	Organizing the Bacolod Traffic Authority Office (BTAO), subject to City Ordinance No. 230	Dec. 5, 2002
OR	230	1999	Creating the Bacolod Traffic Authority (BTA), It's Component Office and Providing Funds Thereof	
RS	802	1998	Requesting the Land Transportation Office (LTO) through Leopoldo Gepes, supervising transportation regulation officer, to conduct spot checking of franchise papers of all public utility jeepneys (PUJs) and public utility buses (PUBs) plying the City of Bacolod	Oct 8, 1998
OR	223	1998	Establishing the via route of Alijis-Libertad franchise and integrating this ordinance as part of the integrated traffic management system of the City of Bacolod upon approval of the latter	Sep 24, 1998
RS	227	1997	Requesting the Traffic Management Council (TMC) to study the establishment of a common waiting station for all south-bound jeepneys, 4-wheeled vehicles, within the corner of Mabini-Mercedes Streets at Libertad Market under certain terms and conditions	Feb 27, 1997
OR	68	1990	Regulating the size of cargoes on trucks/vehicles, particularly on the width, length and height, within the City of Bacolod and providing penalties for violations thereof	Sep 27, 1990
OR	27	1987	Creating a Traffic Enforcer Unit for the City of Bacolod and its functions and appropriating certain sum of money for this purpose	Jul 28, 1987
OR	64	1980	Amending Section 8 of Ordinance No. 1524, Series of 1979, "An ordinance redefining, innovating and regulating the traffic of vehicles within the perimeter bordering San Juan Street, Rizal Street, Lacson Street and San Sebastian Street, Bacolod City, redefining the parking and no parking thereon; the loading and unloading within the same and providing penalties for the violation thereon	May 5, 1980
OR	1270	1967	Amending Section 3 of Chapter IX of ordinance No. 110, Series of 1956, entitled "Rights and duties of drivers and pedestrians of public place," and Section 2 of Chapter XXIV of the said ordinance, entitled "Penalties."	
OR	110	1956	Revising and compiling the traffic rules and regulations of the City of Bacolod	

OR City Ordinance
RS Resolution

2) Features of Traffic Laws and Regulations

City ordinances cover wide range of subjects; from the organizational set-up to operation of jeepney, bicycle and even pedestrian. These ordinances have been separately issued in the past so that there is no one single ordinance that sets forth all traffic regulations in force in the city, or set of ordinances that are systematically organized. To rectify such deficiency, comprehensive traffic regulation ordinance is being drafted.

The draft ordinance covers the subjects listed in Table 4.3-7.

TABLE 4.3-7 CONTENTS OF DRAFT ORDINANCE ON COMPREHENSIVE TRAFFIC REGULATION

Section	Contents	Remarks
4	Route for public utility vehicles (PUV)	23 PUV routes
4	Route for trucks	5 cargo truck routes and truck ban area for trucks of 4.5 ton or heavier with conditions
5	On-street PUV waiting station	5 locations
6	No left turn intersections	22 intersections
7	Loading and unloading zone for PUV	16 streets,133 locations
8	One-way street	13 road sections
9	No parking at loading and unloading zone	
10	Special loading and unloading zones for disabled	
11	Traffic signage and ramps for disabled	

4.3.6 Traffic Regulation

1) One-Way

One-way operation is effective in reducing conflicts at intersections. The central area of Bacolod City has a grid road network which is ideal for one-way operation. One-way system has been introduced, however, only limited sections of the grid network, and around City Plaza. Another counterclockwise one-way system is found around Libertad Market.

There is no continuity of the number of lanes at the boundary of one-way section and two-way sections, however. For example, one-way roads and two-way roads meet at one corner of City Plaza at Gatuslao – Rizal intersection. The vehicle movements at the intersection are irregular due to the change of the system. The location is one of the bottleneck points and accident rate there is high. An island must be constructed at the intersection to guide traffic flow properly.

The proposed comprehensive traffic regulation ordinance specifies sections of 13 streets as one-way street.

2) Turning Restriction

There are only several intersections where left turn is prohibited due to high traffic volume or geometric reasons like intersection of Burgos – Lopez Jaena and Lacson – Galo. Map or list of intersections with turning restriction is not available. Left turn from major street to crossing street is not prohibited at intersections along Lacson. High accident rate along Lacson may be attributed to left turn movement allowed. Further analysis is necessary to verify the hypothesis.

The proposed comprehensive traffic regulation ordinance specifies no left turn at 22 intersections along Araneta, Gatuslao, Lacson, Burgos and Aquino Drive.

3) Truck Ban

Truck ban is also not clear as there is no list or map. No traffic sign is also installed at the boundary of the restriction. The proposed comprehensive traffic regulation ordinance specifies two sets of truck routes; one for cargo trucks of less than 4.5 tons and another for trucks of more than 4.5 tons. The former specifies the routes to and from reclamation area to and from the north, east and south, while the latter bans trucks of more than 4.5 tons from entering the area bounded by San Juan, Rizal, Lacson and San Sebastian streets. Exemption is given to trucks that actually deliver goods and merchandise with loading and unloading time restricted to before 10:00 am, between 1:00 pm to 4:00 pm, and after 8:00 pm.

4) Parking Prohibition

On-street parking is prohibited along some roads. But again, details are not clear. The current version of the proposed comprehensive traffic regulation ordinance only sets forth that parking is strictly prohibited at the designated loading and unloading zones. More specific restriction is expected in the final version of the ordinance.

4.3.7 Traffic Safety

1) Traffic Accident Record

The Table 4.3-8 shows the accident record for the month of January 2000 classified by the nature of accident and its severity. A total of 462 vehicle vs. vehicle accidents, 24 vehicle vs. pedestrian accidents and 8 vehicle vs. property accidents occurred during the month.

The most accident-prone location is Lacson Street, of the two north-south arterial streets with the extremely high number of 88 accidents in the month followed by Hernaez, Burgos, Mansilingan and Araneta, all of which are arterial streets. As the period covered is short, there is no clear indication as to the high risk location of fatal accident. Accident prone locations are also the place for many injuries. In addition Hilado Street shows relatively high number of injured compared with the number of accidents. Long term data must be collected and analyzed to identify the accident prone locations and causes of accidents.

It would be worthwhile to analyze the relationship between road structure and accidents rate. It seems that less accident occurs on the roads with median like Aquino Drive and Hilado.

Accident rate in Bacolod seems to be slightly higher than that in Iloilo City, where a total of 4,687 accidents occurred, 14 persons killed and 726 persons injured during year 2002. But again, the long term data is required to make more analytical comparison.

TABLE 4.3-8 LOCATION, NATURE AND SEVERITY OF ACCIDENT (JANUARY 2000)

			Nature			Severity	
	Location	Veh-veh	Veh-Ped	Veh-Pro	Fatality	Injured	Damage
1	Mabini	8					8
2	Villamonte	12	4		1	3	12
3	Singcang	5	1		1	1	4
4	Circumferential	14	1	1		3	13
5	Lacson	88				15	73
6	Mansilingan	22	2	3		3	12
7	Granada	1		1			2
8	San Sebastian	11					11
9	Burgos	23	1			1	23
10	Banago	5				1	4
11	Mandalagan	13				1	12
12	Alijis	7				1	4
13	SanJuan	13	1		1	3	10
14	Bs Aquino Drive	20				2	19
15	Sum-ag	6	1			3	4
16	Bata	8				2	6
17	South Acapitol	1					
18	Sta. Fe	1					
19	Araneta	21	3			13	23
20	Rodriguez Ave.	3				1	2
21	Reclamation	4				11	2
22	Gatuslo	8	1			1	8
23	Rizal	9					9
24	Lopue's east	2					2
25	Riverside	1					1
26	Cuadra	1					1
27	Rosario	3					3
28	Goldenfield	3					3
29	Tangub	5				1	4
30	La Salle	8			1	1	7
31	Alunan	4				1	3
32	Nroth Drive	5				1	5
33	Merceds Ave.	2					2
34	Gonzaga	11					6
35	Capitiville		1			1	5
36	Roax Ave.	1					1
37	Taculing	5	1			4	2
38	San Patricio	1				1	1
39	Aguinaldo	3					2
40	Narra	1				1	1
41	Handumanan	2	1				2
42	Galo	12					12
43	Luzuriaga	6					6
44	Hilado	13	2	1		6	10
45	Magsaysay	8	1	2		1	10
46	Abkasa	1				1	
47	Locsin	3				2	7
48	Fortune Towne		1			1	
49	Hernaez	26	1			4	23
50	L. Jaena	10				3	7
51	Lizares	8				1	7
52	Petron Compd.	1				1	1
53	Pta. Taytay	8					5
54	Sta. Clara	1					1
55	Pagla-um	1					1
56	City Hghts.	1					1
57	Sharina Hghts.	1					1
58	Florence Ville	1					1
59	Dona Juliana		1			1	
Total		462	24	8	4	97	405

Notes: *Veh-veh: Vehicle to vehicle accident*
Veh-ped Vehicle to pedestrian accident
Veh-pro Vehicle to property accident

Part-C (Metro Bacolod)

4.3.8 Traffic Management Issues

Based on the present condition of traffic in the study are described above, issues related to traffic management can be summarized as shown below. Road density in Bacolod City is high compared with other cities but the traffic management is currently not taking advantage of the physical condition and various modes of traffic are not separated resulting in a situation where congestion easily develops.

a. Inadequate Intersection Geometry

Many intersections are constructed just as an intersecting point of two or more roads without adequate traffic engineering consideration and design. Left turn bay is not provided to intersection where road is wide and such facility is easily constructed. Advantage of wide road is not fully utilized and intersection is generally too large. Coupled with lack of median and island, traffic flow is not orderly.

b. Lack of Traffic Engineering Approach

The roads around City Plaza are one-way street. but interface with the connecting two-way road is not properly designed. As a result, the location is one of the accident prone spots. Improper interface between one-way street and two-way street is also found at other location. Left turn bay is not constructed at location with wide right of way where such facility is effective. Lack of traffic engineering approach is evident.

c. Unfriendly Environment for Pedestrians

Roads at the central area are provided with sidewalk. But it is generally too narrow and often occupied by parked vehicles. In suburbs, no sidewalk is provided and movements of pedestrian and vehicle are not segregated.

FIGURE 4.3-13 UNFRIENDLY ENVIRONMENT FOR PEDESTRIANS

d. Indiscriminate Parking

Roads in Bacolod City are relatively wide. But outer lane is often occupied by parked vehicles so that effective capacity is not necessarily large. Sidewalk which is intended for use by pedestrians is converted to parking lot at many locations. Parked car is often found on sidewalk forcing pedestrian to walk on carriageway. The city does not have parking neither management policy nor an ordinance that

specify parking space requirement for new building so that off-street parking facility is not developed. All of these have resulted in the present chaotic condition.

e. Lack of Basic Traffic Control Device

Basic traffic control devices such as traffic sign, pavement marking, delineator and stud are desperately lacking. The situation is better in Talisay City and Bago City. But pavement markings in these cities are also faded. In Bacolod City, traffic sign of standard design is scarce. Traffic control devices seem not to have tangible effect on the traffic flow individually but if they are properly installed in combination, it will make traffic flow more orderly and safe and contribute to the efficient traffic operation. Roads have enough width for painted imaginary median, raised median or chatter bar to separate opposing traffic but these devices are not installed.

f. Traffic Signal

There are six (6) traffic signals in Bacolod City, of which four (4) signals are working. The reason for non-working signal at intersections where signal is warranted is not clear. Two signals have wrong phasing sequence. All signals require review of phasing and timing parameters. There are several intersections where signal is warranted. Traffic aides manage traffic flow at the moment. But they are not so efficient as traffic signal and congestion often develops.

g. Lack of Professionalism of Traffic Aides

At the moment, traffic aides are short term contractual employee only. There is no qualification for becoming traffic aide and no training is provided after recruitment. As a result their role and efficiency are limited.

In conclusion, generally wide road width does not contribute to a better traffic environment at the moment. Traffic management facilities and practices were not seriously studied and improved until the situation is becoming worse. Measures based on the modern traffic engineering technology must be introduced. Traffic police, traffic aide, staff in City Engineer's Office and those who engage in traffic management must be trained for basics of traffic engineering. At the same time, people must change their concept and behavior regarding traffic so as not to hinder the economic, social and cultural development of the area with poor transportation system.

4.3.9 Recommended Measures

In order to address the issues described above and to make traffic flow more efficient and to enhance traffic safety, the measures listed below are recommended. For the central area of Bacolod City, in particular, comprehensive set of measures must be planned and implemented.

a. Geometric Improvement of Intersection

Taking advantage of wide roads, median and corner island, which are effective in streamlining the flow, will be installed. Sidewalk will be constructed or widened.

b. Traffic Engineering Approach

Review of one-way system, banning of left turn, banning of on-street parking, truck ban, jeepney route, traffic accident analysis, and traffic safety program will be undertaken using traffic engineering approach.

c. Enhancement of Pedestrian Environment

Removal of obstruction on sidewalk, restoring sidewalk used as parking area, decorated sidewalk pavement and planting of trees will be undertaken to create friendly environment for pedestrians. Pedestrian mall and transit mall on Sundays and holidays will be studied and implemented with the cooperation of agencies concerned.

d. Installation of Traffic Control and Safety Device

Traffic sign: Traffic signs of stop, no-parking, one-way, no entry, no left turn, no loading and unloading, etc. will be installed. The design of sign must conform to the national standards prepared by DPWH.

Pavement marking: Pavement markings such as stop line, pedestrian crossing, center line, lane line, etc. will be installed on national roads and other arterial streets in Iloilo City. The layout and color of pavement markings must conform to the national standards prepared by DPWH.

Others: Chatter bar, delineator, guardrail, reflector, pavement stud, etc. will be installed at locations where such devices are needed.

e. Development of Signal System

Phasing and timing parameters of the existing signal must be reviewed and updated. New signal will be installed at approximately ten (10) locations. Those signals that are located in the central area, where distance between signals is close, signals must be coordinated.

f. Establishment of Parking Policy and Its Implementation

A ordinance that specify the parking space requirement for new building must be legislated. Parking on main streets must be prohibited and the restriction must be enforced. Paid on-street or off-street parking must be developed and parking business by private sector is encouraged. At the same time, a campaign aimed at modifying the perception of resident about parking will be held.

g. Training of Staff Engaged in Traffic Management

Training on traffic facility development and traffic operation will be provided to traffic police, traffic aides, city hall staff engaged in traffic management depending on their duties and responsibilities.