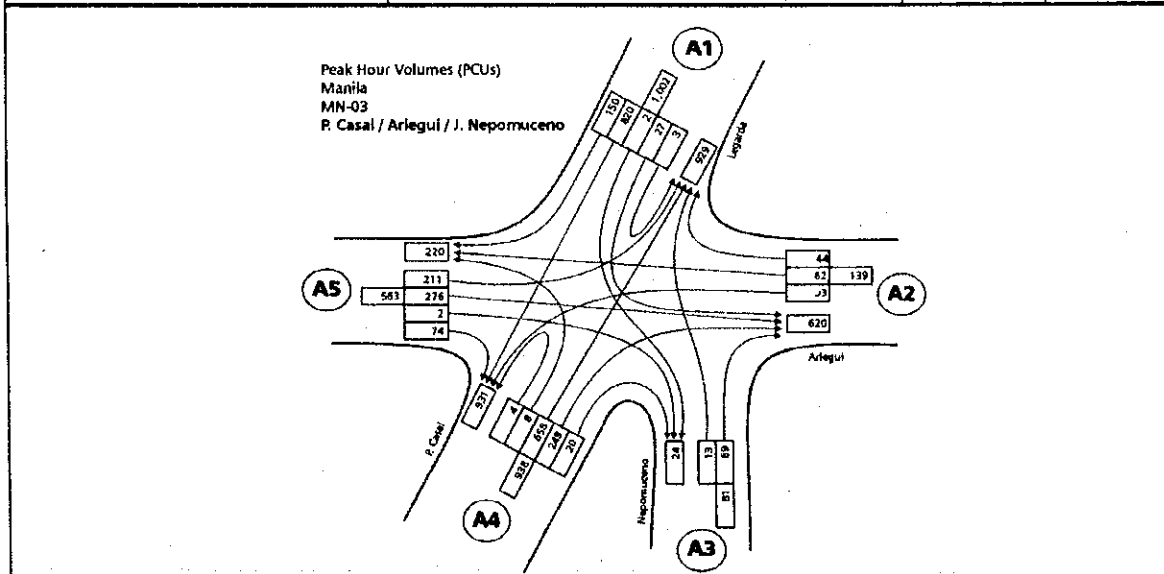


Name	P Casal / Arlegui / J Nepomuceno	Code	MN-03
Sheet	Summary of Observations	LGU	Manila
Traffic Conditions	<ul style="list-style-type: none"> 1) Heavy traffic flow along P. Casal and J.Nepomuceno. 2) Heavy pedestrian movement on all legs (5-way intersection). 3) Pedicabs cross intersection and operate around the area. 		
Physical Conditions	<ul style="list-style-type: none"> 1) A signalized intersection (under the SMART System). 2) 5 legs; partly channelized with one leg (J. Nepomuceno) basically one way. 3) P. Casal and J. Nepomuceno have medians. 4) Pavement markings applied; yellow box present. 5) Gasoline station close to the intersection. 6) Two campuses of TIP in the vicinity of the intersection. 7) PLDT parking, entry and exit driveways right at one quadrant of the intersection. 8) Garbage pile on one side of Arlegui occupies almost one lane 		

Signalization	Signalized	Pavement Markings	With markings	Peak	17:00-18:00		
Approach	Dimensions	Peak Hour Traffic Volumes (PCUs)				% Public Transport	Pedestrian Volume
		Left	Through	Right	Total		
A1: Legarda (N)	20.6m	32	820	150	1,002	48.04%	Medium - Heavy
A2: Arlegui (E)	11m	33	62	44	139	48.62%	Heavy
A3: Nepomuceno (SE)	6.3m	NA	13	69	81	20.49%	Light
A4: P Casal (SW)	17.9m	12	658	269	938	63.08%	Heavy
A5: Arlegui (W)	11m	211	276	76	563	59.00%	Medium
Total		288	1,829	606	2,722		
Passenger Flows							

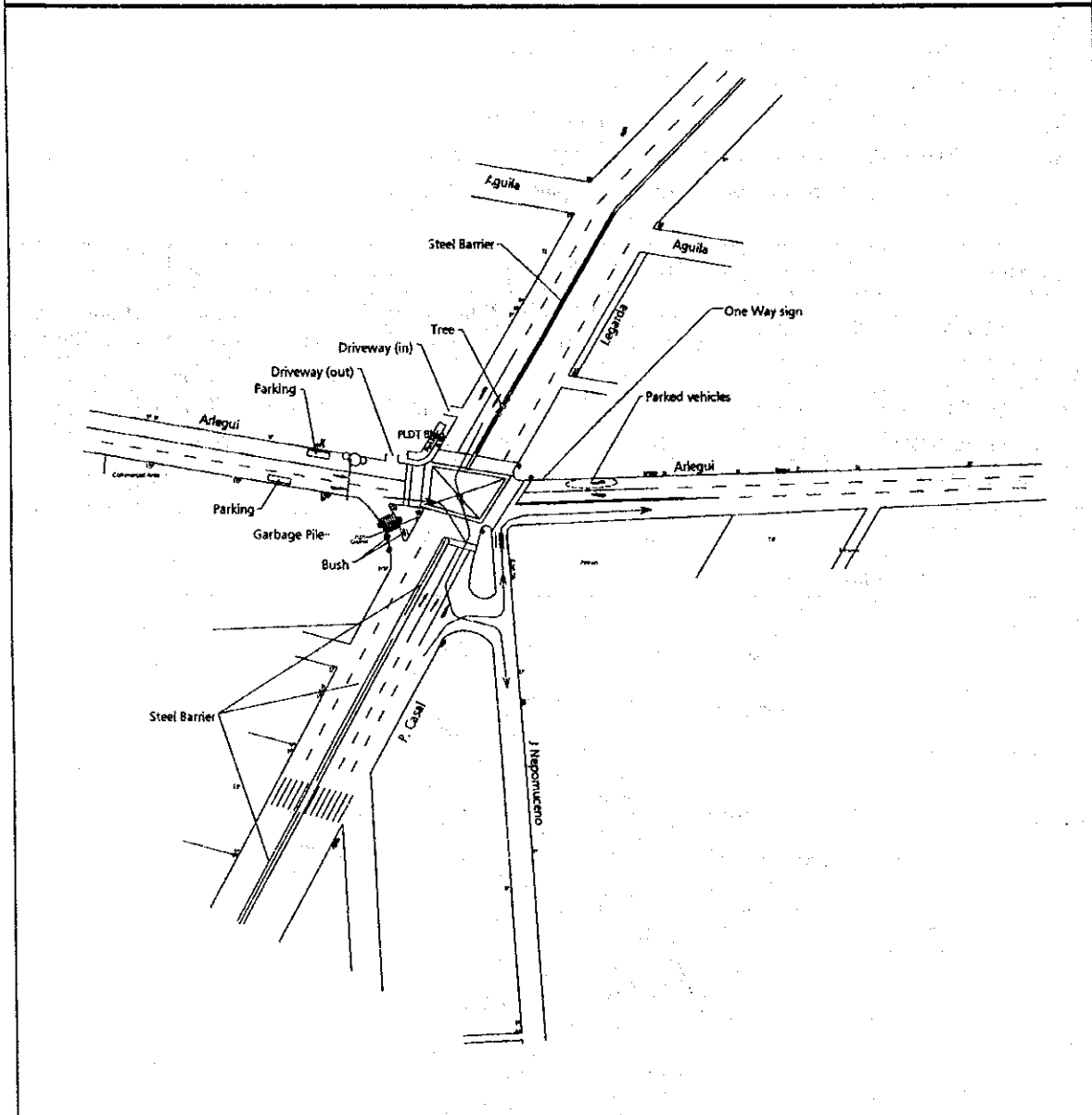


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Small Scale Traffic Improvement Measures for Metro Manila

Name	P Casal / Arlegui / J Nepomuceno	Code	MN-03
Sheet	Analysis	LGU	Manila

- 1) The intersection is included in the Metro Manila Signalization Project dubbed as SMART. The 3-phase signal looks appropriate. However, some problems exist due to the intersection leg (J. Nepomuceno) which was separated from the intersection by a big island (mini-park). Occasionally, some trucks and private vehicles were observed to directly oppose the traffic in order to go to J Nepomuceno. This maneuver is too dangerous and therefore must be strictly prohibited;
- 2) The effect of PLDT parking and driveways is considered minimal due to its low volume/frequency.



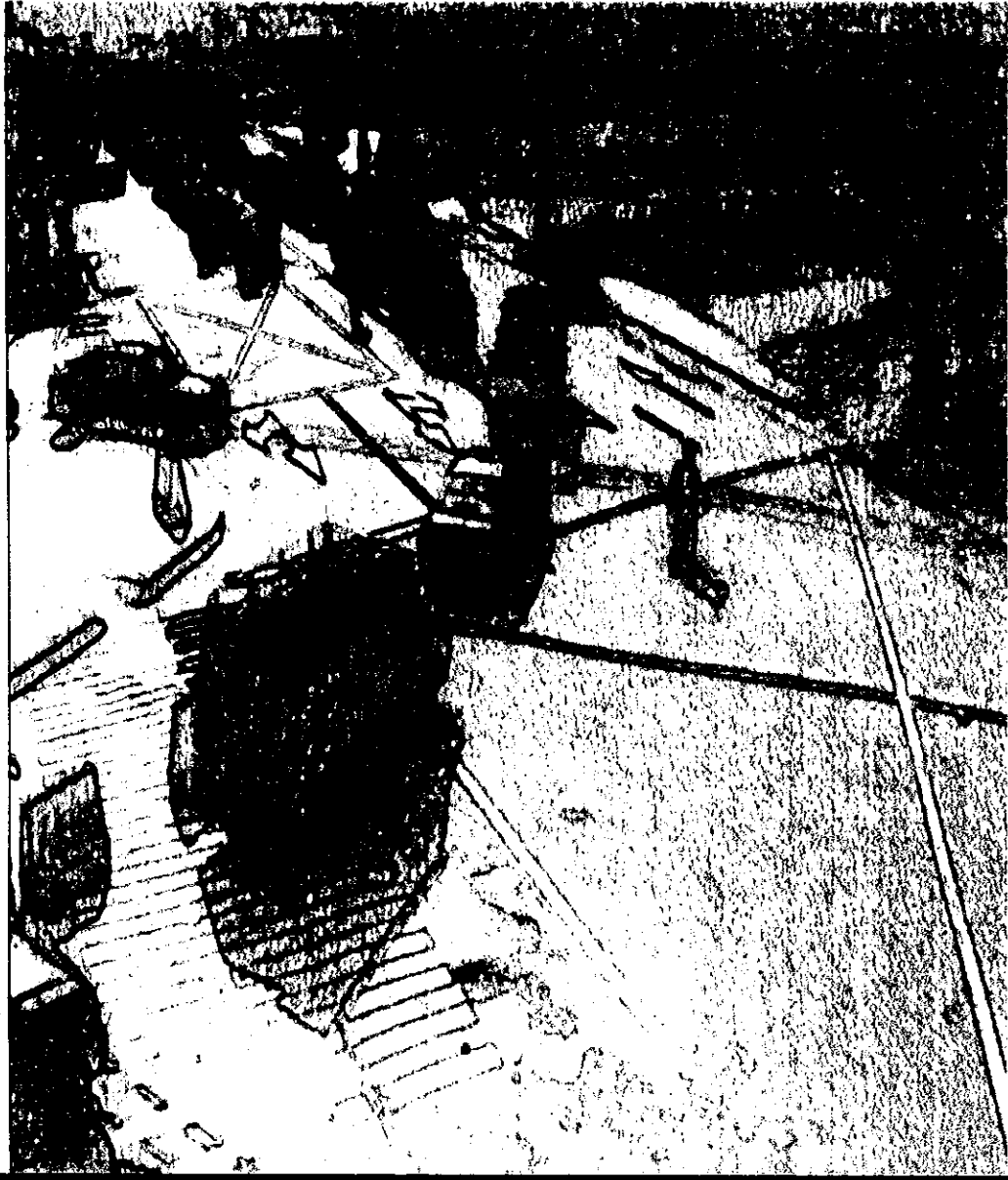
Name	P Casal / Arlegui / J Nepomuceno	Code	MN-03
Sheet	Proposed Improvements	LGU	Manila
Engineering	<ol style="list-style-type: none"> 1) Re-impose pavement markings on all approaches. 2) Modify island (south side of Arlegui) at entrance of J. Nepomuceno to restrict vehicles entry of left-turn from Legarda (north) and Arlegui (east). 3) Garbage pile along Arlegui must be removed. It partially blocks the through traffic and totally leaves no walking space for pedestrians; 4) Plants in one quadrant (P. Casal - Arlegui) must be trimmed. They limit sight distance in that quadrant. 		
Enforcement	<ol style="list-style-type: none"> 1) The intersection requires periodic presence of a traffic enforcer to apprehend drivers performing the risky maneuvers. 2) The enforcer must also regulate pedestrians crossing the street even during green indication; 3) The pedicab movement must also be registered, as they should not mix with motor vehicle traffic. 4) Parking along Arlegui must be 30m. away from the intersection. 		

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Small Scale Traffic Improvement Measures for Metro Manila

LOCATION: MN03, P.Casal / Arlegui / J Nepomuceno (MANILA)
(cost summary)

A. Pavement Markings:	<u>Unit</u>	<u>Quantity</u>	<u>Unit Cost</u>	<u>Total Cost</u>
<i>Longitudinal Lines:</i>				
1. Center Lines				
a) Broken Line, 100 or 150mm width, 3m length	l.m	-	-	-
b) Solid White Lines, 200mm width	l.m	300.00	150.00	45,000.00
2. Lane Lines (100mm or 150mm width)				
a) Solid Lines, w = 150 mm	l.m	120.00	112.50	13,500.00
b) Broken Lines w= 150mm	l.m	720.00	45.00	32,400.00
3. Barrier Lines				
a) Unbroken Double Yellow Lines (100 or 150mm width)	l.m	-	-	-
b) Single Yellow Line with broken White Lines (100-150mm)	l.m	-	-	-
4. Edge Lines				
a) Pavement Edge (Shoulders)	l.m	-	-	-
b) Median Edge	l.m	-	-	-
5. Continuity Line				
a) Pavement Edge (Shoulders)	l.m	-	-	-
6. Transition Line				
a) Pavement Edge (Shoulders)	l.m	-	-	-
b) Median Edge	l.m	-	-	-
<i>Transverse Lines:</i>				
1. Stop Lines (Solid Lines) white, width = 450 mm	l.m	19.50	337.50	6,581.25
2. Give Way (Yield Lines)	l.m	-	-	-
3. Pedestrian Crossing Markings				
a) Zebra Crossing (Non-Signalized), width = 300mm	l.m	18.00	225.00	4,050.00
b) Cross Walks (Signalized), width = 300mm	l.m	87.00	225.00	19,575.00
<i>Other Lines:</i>				
1. Turn Lines (broken Lines)	l.m	-	-	-
2. Parking Bay Lines				
a) Parallel Bays, width = 100mm	l.m	54.00	75.00	4,050.00
b) Angle Bays	l.m	-	-	-
3. Painted Median Islands				
a) Parallel Bays, width = 100mm	l.m	-	-	-
4. BUS and PUJ Lane Markings				
a) Parallel Bays, width = 100mm	l.m	-	-	-
5. Channelized Junction Pavement Marking				
a) Parallel Bays, width = 100mm	l.m	-	-	-
6. Yellow Box Line, w= 150mm	l.m	59.00	112.50	6,637.50
<i>Other Markings:</i>				
1. Approach Markings to Islands and Obstructions	l.m	-	-	-
2. Chevron Markings	l.m	-	-	-
3. Curb Markings for Parking Restrictions	l.m	60.00	262.50	15,750.00
4. Approach to Railroad Crossings	l.m	-	-	-
<i>Messages and Symbols:</i>				
1) Messages				
a) Give Way symbol	pcs	-	-	-
2) Symbols				
a) Give Way symbol	pcs	-	-	-
b) Pavement Arrows				
1) Through Arrow = 1.21 sq.m / each	pcs	8.00	907.50	7,260.00
2) Combined Arrow = 2.44 sq.m / each	pcs	8.00	1,830.00	14,640.00
3) Turn Arrow = 1.46 sq. m / each	pcs	4.00	1,095.00	4,380.00
c) Numerals	pcs	-	-	-
B. Signs				
1. No Parking Sign	Units	3.00	2,716.00	8,148.00
2. Pedestrian Crossing Sign	Units	3.00	3,850.00	11,550.00
3. Stop Sign	Units	4.00	2,718.00	10,872.00
C. Other Works				
1. Miscellaneous Works	l.s.	-	-	6,000.00
TOTAL				210,393.75
Contingencies, 5%				10,519.69
CMS, 10%				21,039.38
Miscellaneous (fees, permits, etc), 5%				10,519.69
Govt. Supervision, 2%				4,207.88
TOTAL COST				256,680.38



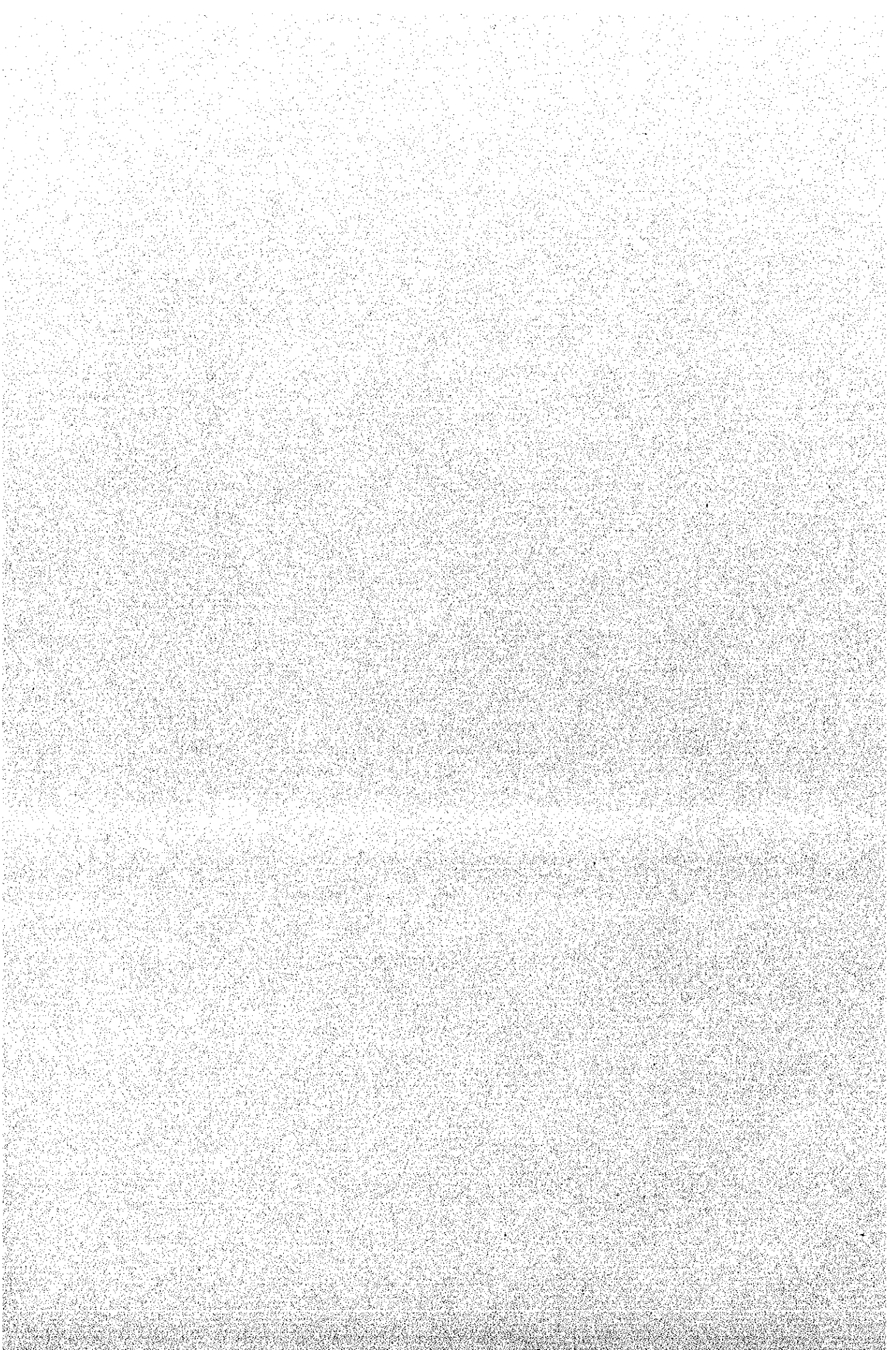
Marikina

Individual Information Sheets for the Traffic Bottleneck Points

MR-01 BG Molina St / G del Pilar St

MR-02 J Sumulong Hwy / MacDonald's Dr

MR-03 J Sumulong Hwy / A Tuazon St



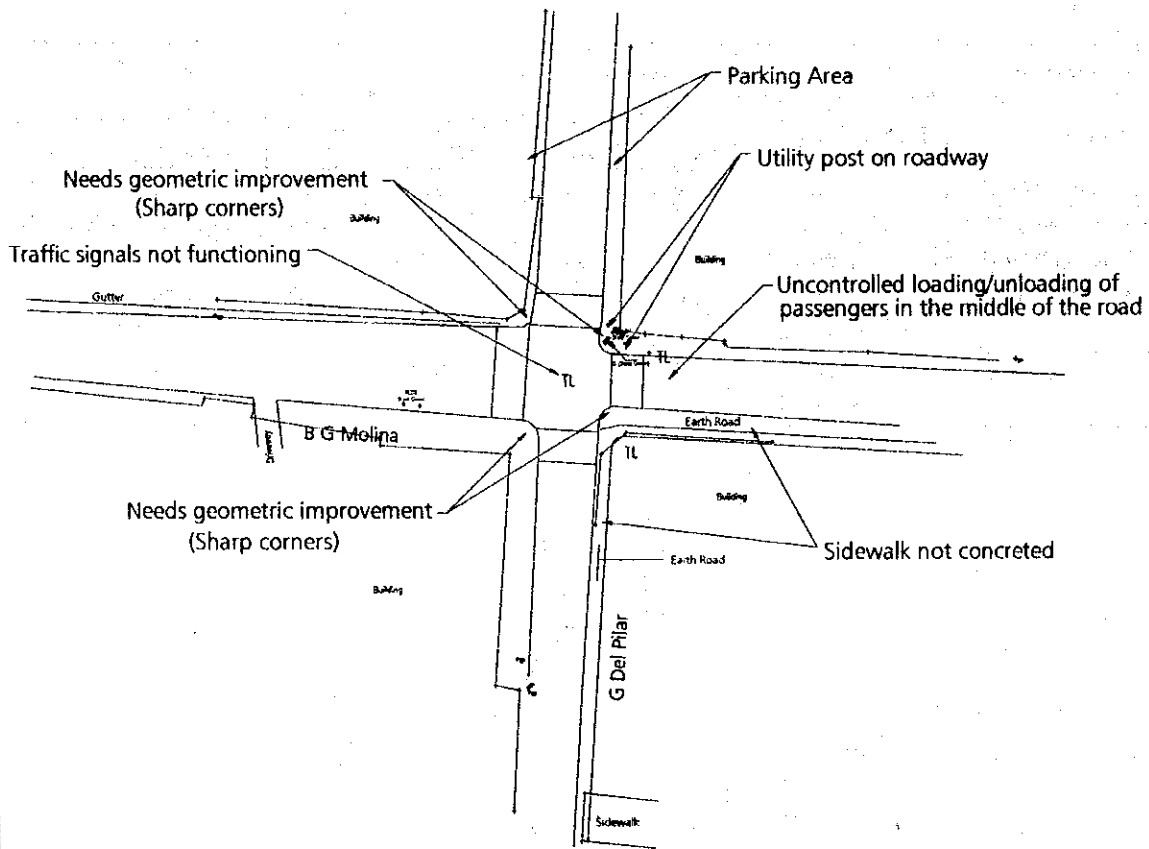
Name	BG Molina / G del Pilar			Code	MR-01		
Sheet	Summary of Observations			LGU	Marikina		
Traffic Conditions	1) Uncontrolled loading /unloading of passengers in the middle of the road, particularly at the eastern approach of BG Molina.						
Physical Conditions	1) A cross T-intersection along a heavily built up area in Marikina. The intersecting roads have a bi-directional carriageway with all pavement corners in substandard geometric conditions. 2) One section of B.G. Molina St. has been widened slightly; whereas, the other section is still narrow but could accommodate a slight widening at the intersection approach. G. Del Pilar could accommodate a transition lane on one section, but has no available space for widening at the other end. Utilities occupy mostly the available space at the intersection. 3) The intersection is paved with concrete surfacing in good condition						
Signalization	None	Pavement Markings	None	Peak	17:00-18:00		
Approach	Dimensions	Peak Hour Traffic Volumes (PCUs)				% Public Transport	Pedestrian Volume
		Left	Through	Right	Total		
A1: G del Pilar (N)	8.0m	9	223	79	311	43.83%	Moderate
A2: B Molina (E)	6.5.0m	11	79	125	214	76.34%	Moderate
A3: G del Pilar (S)	7.0m	54	276	84	414	37.12%	Moderate
A4: B Molina (W)	8.5-11m	54	275	81	410	56.42%	Moderate
Total		128	853	369	1349		
Passenger Flows						2,700	
<p>Peak Hour Volumes (PCUs) Marikina MR-01 BG Molina / G del Pilar</p>							

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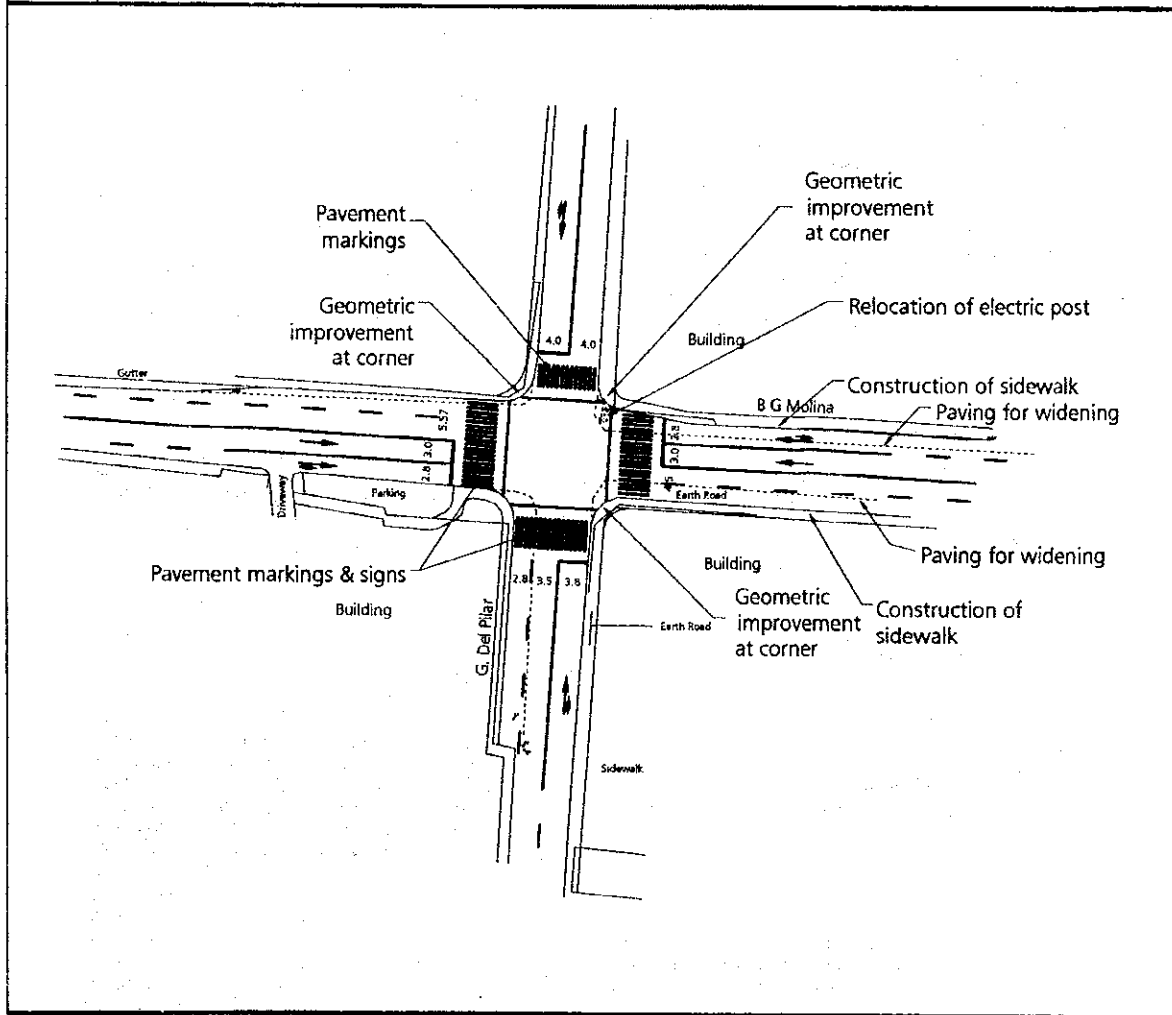
Small Scale Traffic Improvement Measures for Metro Manila

Name	BG Molina / G del Pilar	Code	MR-01
Sheet	Analysis	LGU	Marikina

- 1) Both BG Molina & Del Pilar Sts. are two lanes, two way roads with sharp corners in all quadrants of the intersection.
- 2) No defined loading/unloading zones.
- 3) No proper control for pedestrian movements.
- 4) Inadequate paved sidewalks on some sections of the roadway.



Name	BG Molina / G del Pilar	Code	MR-01
Sheet	Proposed Improvements	LGU	Marikina
Engineering	<ol style="list-style-type: none"> 1) Geometric improvements on all corners (wider corner radii). 2) Pave both sides of Molina St. east approach for additional outer lanes. 3) Construction of sidewalk on both sides of Molina east approach. 4) Relocation of electric posts at north east corner. 5) Loading / Unloading zones with waiting sheds, pavement markings and traffic signs several meters before the intersection. 6) Provide fence to control traffic movement. 		
Enforcement	<ol style="list-style-type: none"> 1) Strict implementation of no loading / unloading regulations at corners, and middle of roadway. 		



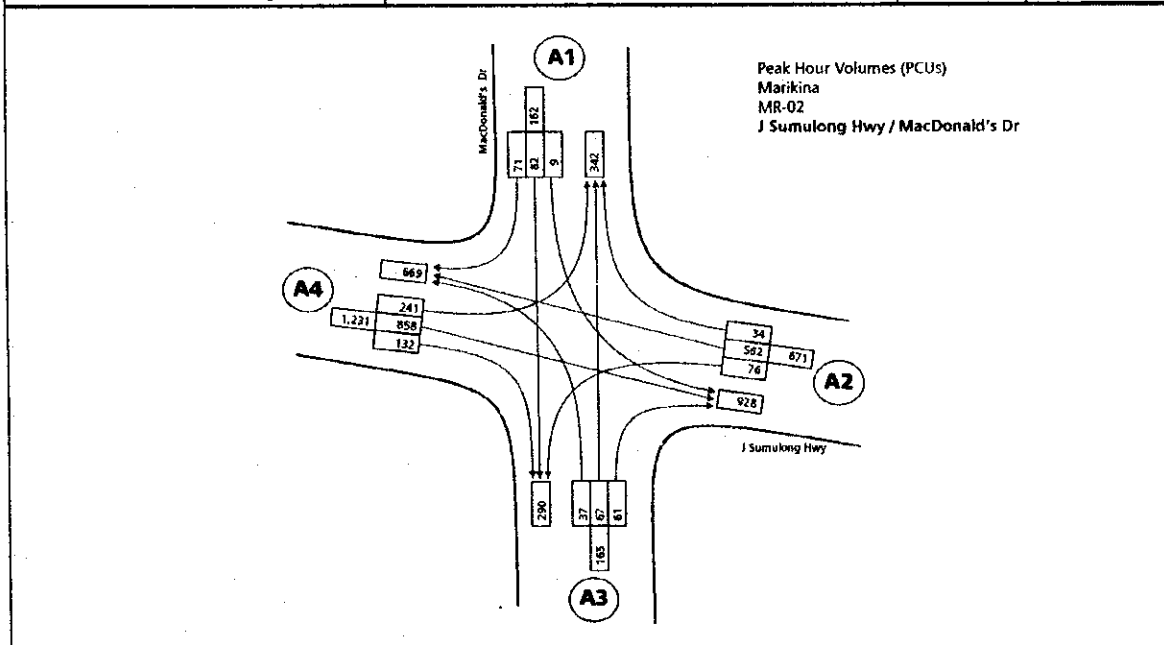
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Small Scale Traffic Improvement Measures for Metro Manila

LOCATION : MR-01: BG Molina / G. del Pilar (LAS PIÑAS)
(cost summary)

A. Pavement Markings	Unit	Quantity	Unit Cost	Total Cost
<i>Longitudinal Lines</i>				
1. Center Lines				
a.) Broken Lines, 100 or 150 mm width, 3m length 4.50 m gaps	l.m.	260.00	45.00	11,700.00
b.) Solid White Lines, 150mm width	l.m.	90.00	112.50	10,125.00
2. Lane Lines (100 or 150mm width)				
a.) Solid Lines, w = 150mm	l.m.	-	-	-
b.) Broken Lines, w = 150mms, 200mm width	l.m.	-	-	-
3. Barrier Lines				
a.) Unbroken Double Yellow Lines (100 or 150mm width)	l.m.	-	-	-
b.) Single Yellow Line with broken White Lines (100-150mm)	l.m.	-	-	-
4. Edge Lines				
a.) Pavement Edge (Shoulders)	l.m.	-	-	-
b.) Median Edge	l.m.	-	-	-
5. Continuity Lines	l.m.	-	-	-
6. Transition Line	l.m.	-	-	-
<i>Transverse Lines</i>				
1. Stop Lines (Solid Lines) white, width = 450mm	l.m.	22.00	337.50	7,425.00
2. Give Way (Yield Lines)	l.m.	-	-	-
3. Pedestrian Crossing Markings				
a.) Zebra Crossing (Non-Signalized), width = 300mm	l.m.	320.00	225.00	72,000.00
b.) Cross Walks (Signalized), width = 300mm	l.m.	-	-	-
<i>Other Lines</i>				
1. Turn Lines (Broken Lines)	l.m.	-	-	-
2. Parking Bay Lines				
a.) Parallel Bays, width = 100mm	l.m.	-	-	-
b.) Angle Bays	l.m.	-	-	-
3. Painted Median Islands	l.m.	-	-	-
4. Bus and PUJ Lane Markings	l.m.	-	-	-
5. Channelized Junction Pavement Marking	l.m.	-	-	-
6. Yellow Box Line, w = 200mm	l.m.	-	-	-
<i>Other Markings</i>				
1. Approach Markings to Island and Obstructions	l.m.	-	-	-
2. Chevron Markings	l.m.	-	-	-
3. Curb Markings to Parking Restrictions	l.m.	-	-	-
4. Approach to Railroad Crossings	l.m.	-	-	-
5. Loading/Unloading Zone Lines, (w=200mm)	l.m.	145.00	150.00	21,750.00
<i>Messages and Symbols</i>				
1. Messages	pcs.	-	-	-
2. Symbols				
a.) Give Way Symbol	pcs.	-	-	-
b.) Pavement Arrows				
1.) Through Arrow = 1.21 sq.m. / each	pcs.	2.00	907.50	1,815.00
2.) Combined Arrow = 2.44 sq.m. / each	pcs.	4.00	1,830.00	7,320.00
3.) Turn Arrow = 1.46 sq.m. / each	pcs.	-	-	-
c.) Numerals				
B. Signs				
1. PUJ Loading/Unloading Sign	pcs.	-	-	-
2. No Loading/Unloading Sign	pcs.	-	-	-
3. Tricycle Loading/Unloading Sign	pcs.	-	-	-
4. No Double Parking Area	pcs.	-	-	-
C. Other Works				
1. Remove existing concrete pavement	sq.m.	95.00	250.00	23,750.00
2. New 0.20m thick concrete pavement	cu.m.	33.00	3,944.50	130,168.50
3. Improve Existing Subgrade	sq.m.	165.00	23.77	3,922.05
4. Restore Existing Drainage Manhole	ea	2.00	13,250.00	26,500.00
5. New Curb and Gutter	l.m.	230.00	737.50	169,625.00
6. Surface Preparation	sq.m.	161.26	50.00	8,063.00
TOTAL				494,163.55
Contingencies, 5%				24,708.18
CMS, 10%				49,416.36
Miscellaneous (fees, permits, etc.), 5%				24,708.18
Govt. Supervision, 2%				9,883.27
=====				=====
TOTAL COST				602,879.53

Name	J Sumulong Hwy / MacDonald's Dr			Code	MR-02		
Sheet	Summary of Observations			LGU	Marikina		
Traffic Conditions	1) Drivers do not know exactly where to stop during red (stop line is not clear). 2) Some phasing of signals (red indication for Sumulong) are ignored by drivers. 3) Cycle length too long for some periods of the day. 4) Low pedestrian movement.						
	1) A newly signalized intersection. 2) Pavement in very good condition. 3) Adequate sidewalk. 4) Rope is used as median divider. 5) No lane markings (except pedestrian crosswalk).						
Signalization	Signalized	Pavement Markings	Incomplete	Peak	17:00-18:00		
Approach	Dimensions	Peak Hour Traffic Volumes (PCUs)				% Public Transport	Pedestrian Volume
		Left	Through	Right	Total		
A1: Mcdonalds (N)	7.4m	9	82	71	162	26.0%	Light
A2: J Sumulong (E)	19.5m	76	562	34	671	25.62%	Light
A3: McDonalds (S)	7.35m	37	67	61	928	11.30%	Heavy
A4: J Sumulong (E)	19.5m	241	858	132	1,231	41.87%	Light
Total		363	1,569	298	2,992		
Passenger Flows							

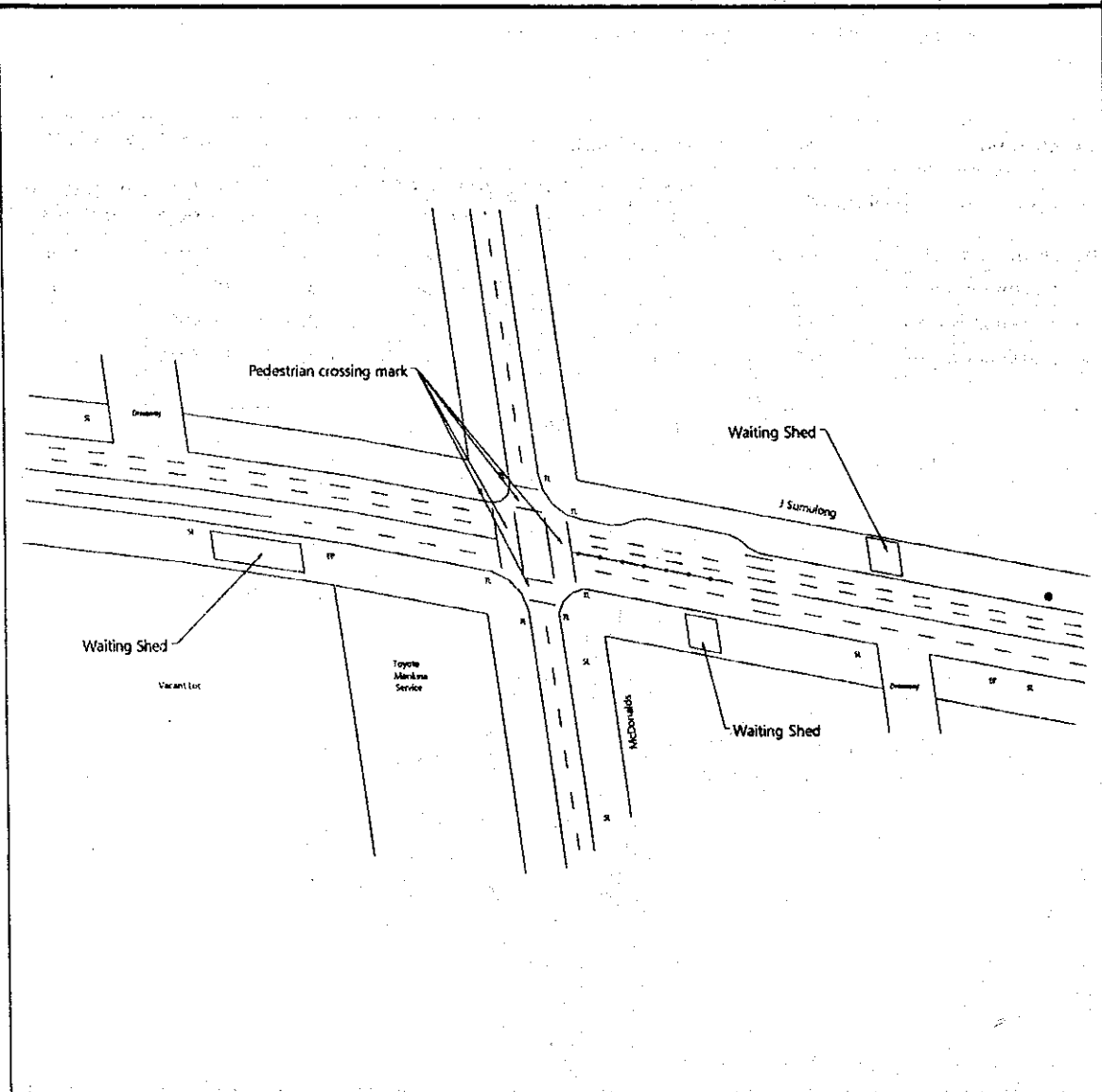


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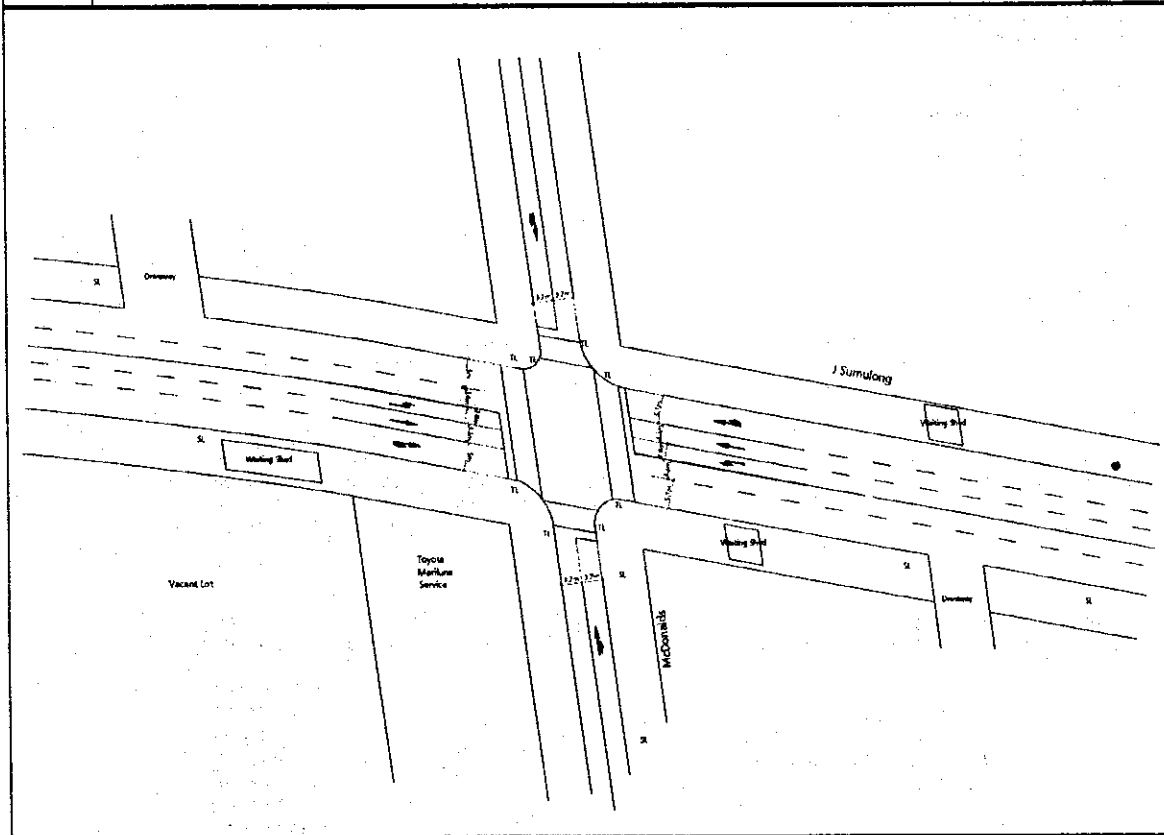
Small Scale Traffic Improvement Measures for Metro Manila

Name	J Sumulong Hwy / MacDonald's Dr	Code	MR-02
Sheet	Analysis	LGU	Marikina

- 1) The major cause of traffic problem at this intersection is improper traffic signal settings, not vehicle volume, particularly the so-called 'buhos' method.
- 2) Due to longer cycle and unbalanced distribution of green times to the different flows, drivers tend to ignore red indications.
- 3) Due to the absence of lane markings, proper regimentation of vehicle is not observed. Drivers also don't know where to stop in relation to the 'stop line'.



Name	J Sumulong Hwy / MacDonald's Dr	Code	MR-02
Sheet	Proposed Improvements	LGU	Marikina
Engineering	<ol style="list-style-type: none"> 1) The traffic signals should be re-programmed to accommodate varying traffic demand throughout the day. At present, the cycle length is not optimized with too much unused green time at the latter part of a phase. 2) Lane markings should be applied to help in the proper regimentation of vehicles in queue as well as increasing approach capacities. Exclusive and shared lanes should be clearly designated. 3) The improvised rope divider/separator along Sumulong Highway should be replaced with a more stable moveable barrier if not a permanent median. 4) Mid-block section will have 4 lanes with a (painted) median of 3.0 meter wide (lane configuration become 4.2, 3.3, 3.0, 3.3, 4.2). Two lanes are enough for the present volume and median serves as refuge place for left turning vehicles into road side facilities. If volumes increase in the future, 3 lanes will be provided to each direction. 5) Left turn lane at the intersection will be extended to 100 meters on both the east side (previously 50 meters) and on the west side (previously 30 meters). In the future, study the coordination of the 3 intersection along Sumulong Highway, namely Shoe Ave., MacDonald's and Tuazon to provide good progression of traffic flow. 		
Enforcement	<ol style="list-style-type: none"> 1) Traffic enforcers should periodically man the intersection to apprehend drivers ignoring the signals. 		



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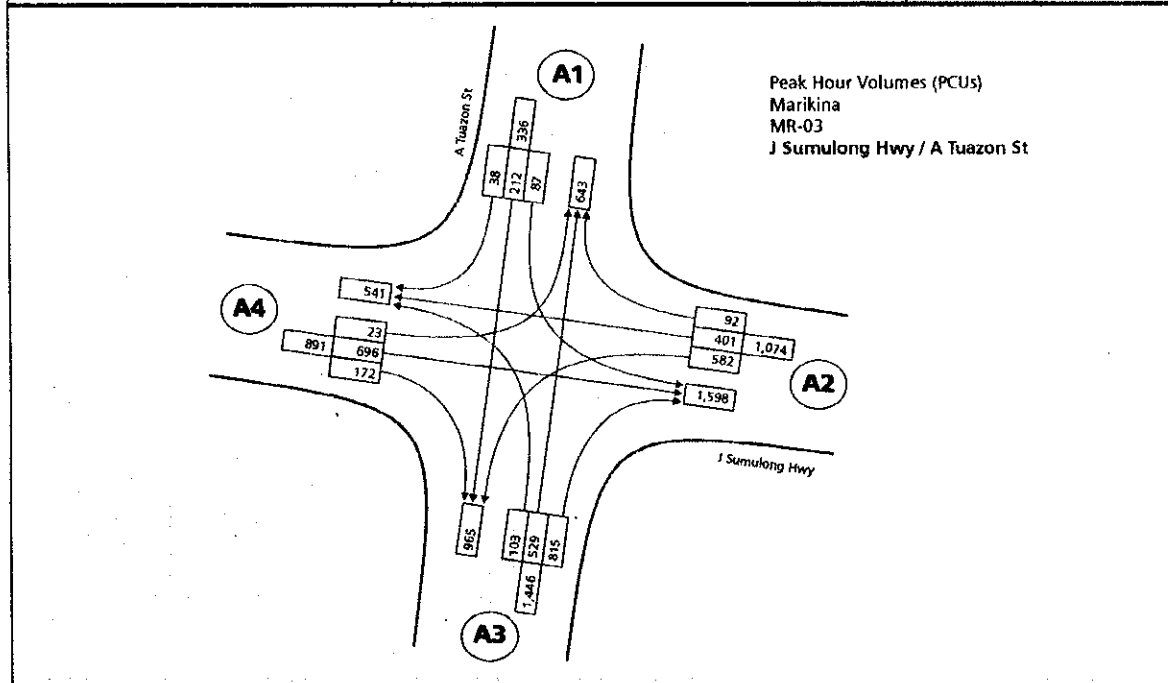
Small Scale Traffic Improvement Measures for Metro Manila

LOCATION: MR02, J. Sumulong Highway / McDonalds Drive (MARIKINA)
(cost summary)

A. Pavement Markings:	Unit	Quantity	Unit Cost	Total Cost
<i>Longitudinal Lines:</i>				
1. Center Lines				
a) Broken Line, 100 or 150mm width, 3m length, w = 150mm	l.m	200.00	45.00	9,000.00
b) Solid White Lines, 200mm width	l.m	200.00	150.00	30,000.00
2. Lane Lines (100mm or 150mm width)				
a) Solid Lines, w = 150 mm	l.m	120.00	112.50	13,500.00
b) Broken Lines w= 150mm	l.m	680.00	45.00	30,600.00
3. Barrier Lines				
a) Unbroken Double Yellow Lines (100 or 150mm width)	l.m	-	-	-
b) Single Yellow Line with broken White Lines (100-150mm)	l.m	-	-	-
4. Edge Lines				
a) Pavement Edge (Shoulders)	l.m	-	-	-
b) Median Edge	l.m	-	-	-
5. Continuity Line				
l.m	-	-	-	-
6. Transition Line				
l.m	-	-	-	-
<i>Transverse Lines:</i>				
1. Stop Lines (Solid Lines) white, width = 450 mm	l.m	22.00	337.50	7,425.00
2. Give Way (Yield Lines)	l.m	-	-	-
3. Pedestrian Crossing Markings				
a) Zebra Crossing (Non-Signalized), width = 300mm	l.m	-	-	-
b) Cross Walks (Signalized), width = 300mm	l.m	90.00	225.00	20,250.00
<i>Other Lines:</i>				
1. Turn Lines (broken Lines)	l.m	-	-	-
2. Parking Bay Lines				
a) Parallel Bays, width = 100mm	l.m	-	-	-
b) Angle Bays	l.m	-	-	-
3. Painted Median Islands				
l.m	-	-	-	-
4. BUS and PUJ Lane Markings				
l.m	-	-	-	-
5. Channelized Junction Pavement Marking				
l.m	-	-	-	-
6. Yellow Box Line, w= 150mm				
l.m	-	-	-	-
<i>Other Markings:</i>				
1. Approach Markings to Islands and Obstructions	l.m	-	-	-
2. Chevron Markings	l.m	-	-	-
3. Curb Markings for Parking Restrictions	l.m	-	-	-
4. Approach to Railroad Crossings	l.m	-	-	-
<i>Messages and Symbols:</i>				
1) Messages	pcs	-	-	-
2) Symbols				
a) Give Way symbol	pcs	-	-	-
b) Pavement Arrows				
1) Through Arrow = 1.21 sq.m / each	pcs	4.00	907.50	3,630.00
2) Combined Arrow = 2.44 sq.m / each	pcs	8.00	1,830.00	14,640.00
3) Turn Arrow = 1.46 sq. m / each	pcs	4.00	1,095.00	4,380.00
c) Numerals	pcs	-	-	-
B. Signs				
1. No Parking Sign	Units	4.00	2,716.00	10,864.00
2. Pedestrian Crossing Sign	Units	6.00	3,850.00	23,100.00
3. Stop Sign	Units	4.00	2,718.00	10,872.00
4. Directional Sign	Units	1.00	2,716.00	2,716.00
C. Other Works				
1. Reprogramming of Traffic Signal	L.S.	-	-	4,000.00
2. Steel Railing at J. Sumulong to Replace Rope Divider	L.m.	20.00	860.00	17,200.00
TOTAL				184,977.00
Contingencies, 5%				9,248.85
CMS, 10%				18,497.70
Miscellaneous (fees, permits, etc), 5%				9,248.85
Govt. Supervision, 2%				3,699.54
TOTAL COST				225,671.94

Name	J Sumulong Hwy / A Tuazon St	Code	MR-03
Sheet	Summary of Observations	LGU	Marikina
Traffic Conditions	<ul style="list-style-type: none"> 1) Low pedestrian traffic. 2) Cycle time too long- causing impatience of drivers thus ignoring red indications. 3) No proper regimentation of vehicles; drivers do not know exactly where to stop during red. 		
Physical Conditions	<ul style="list-style-type: none"> 1) A newly signalized intersection; 2) No lane markings (except pedestrian crosswalk); 3) Pavement in good condition; 4) Sidewalks are adequate, although users are few. 		

Signalization	Signalized	Pavement Markings	Signalized	Peak	17:00-18:00		
Approach	Dimensions	Peak Hour Traffic Volumes (PCUs)				% Public Transport	Pedestrian Volume
		Left	Through	Right	Total		
A1: A Tuazon (N)	13.0m	87	212	38	336	17.43%	Light
A2: J Sumulong (S)	18.0m	582	401	92	1,074	46.70%	Light
A3: A Tuazon (N)	13.0m	103	529	815	1,446	40.78%	Light
A4: J Sumulong (S)	18.0m	23	696	172	891	35.43%	Light
Total		795	1,838	1,117	3,747		
Passenger Flows							

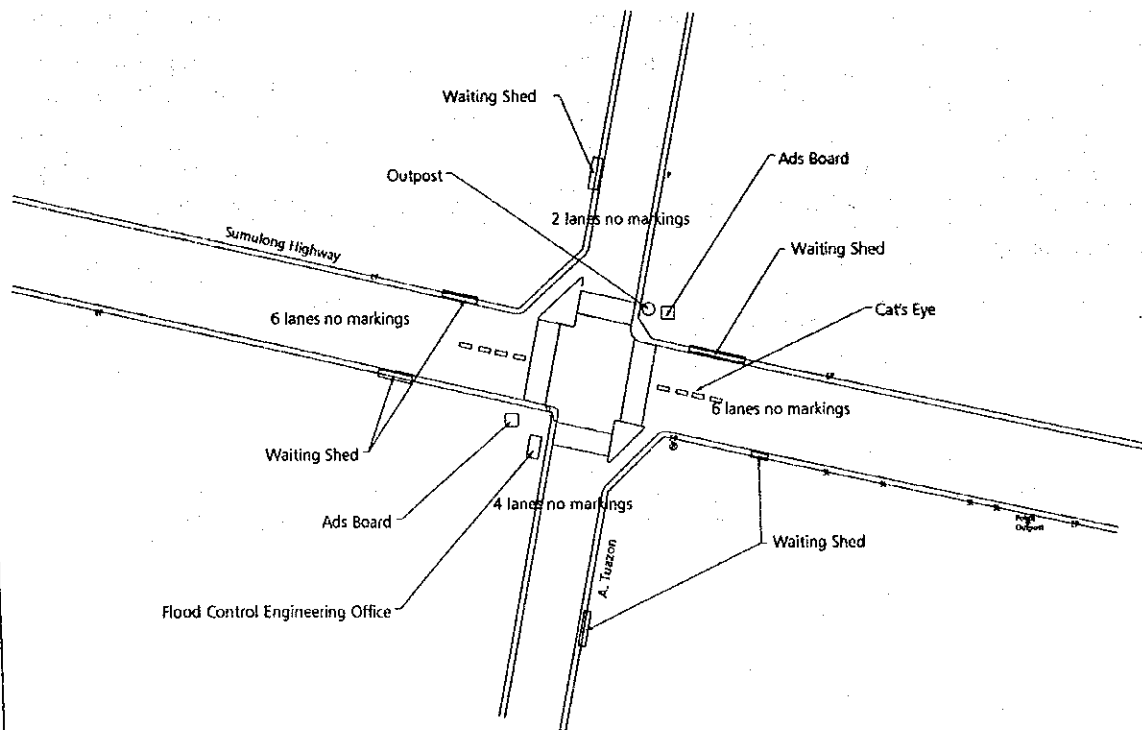


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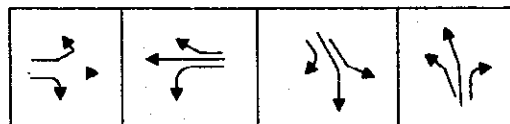
Small Scale Traffic Improvement Measures for Metro Manila

Name	J Sumulong Hwy / A Tuazon St	Code	MR-03
Sheet	Analysis	LGU	Marikina

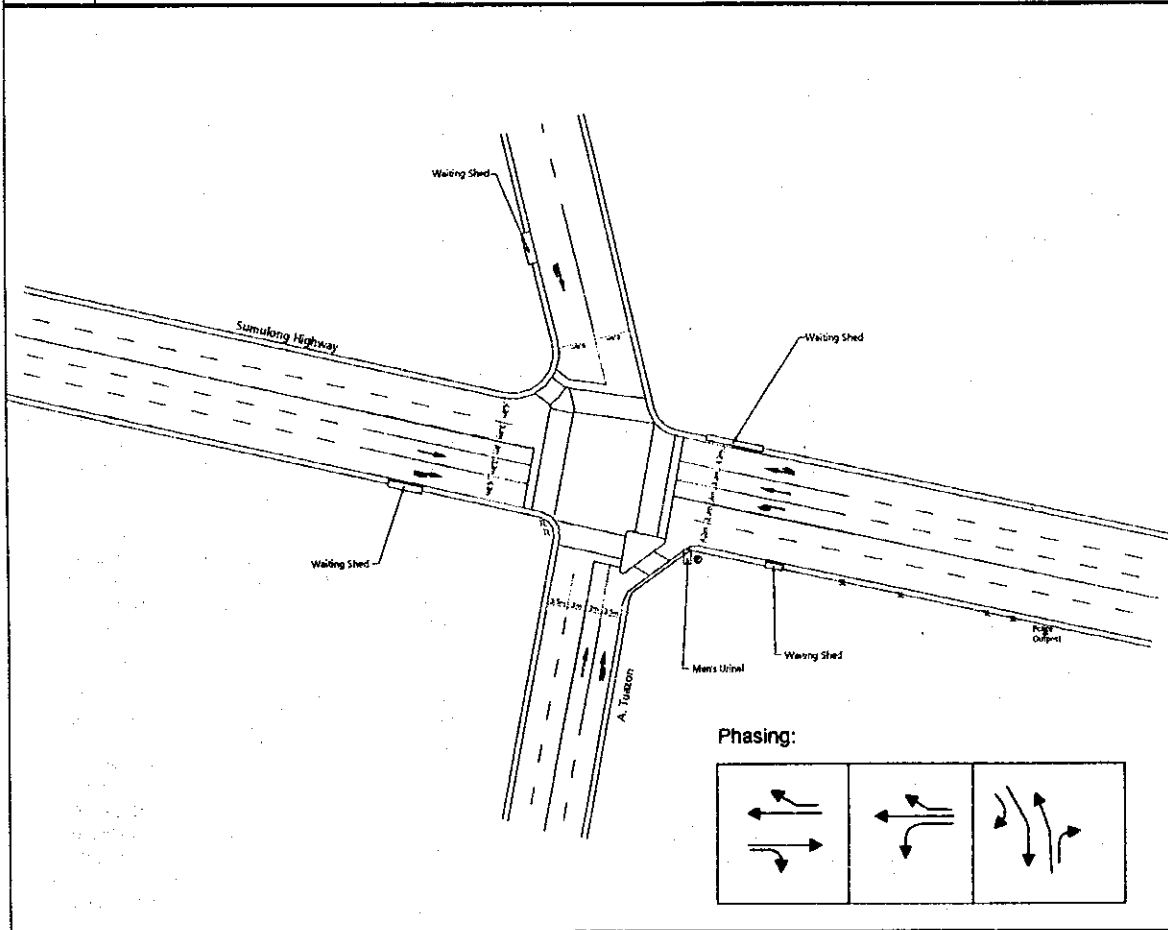
- 1) The major cause of traffic problem at this intersection is improper traffic signal settings, particularly cycle length and green split.
- 2) Due to longer cycle and unbalanced distribution of green times to the different flows, drivers tend to ignore red indications.
- 3) Due to the absence of lane markings, proper regimentation of vehicles is not observed. Drivers also don't know where to stop in relation to the 'stop line'.



Existing Phase Pattern:



Name	J Sumulong Hwy / A Tuazon St	Code	MR-03
Sheet	Proposed Improvements	LGU	Marikina
Engineering	<ol style="list-style-type: none"> 1) The traffic signals should be re-programmed to accommodate varying traffic demand throughout the day. At present, the cycle length is not optimized with too much unused green time at the latter part of most phases. 2) Lane markings should be applied to help in the proper regimentation of vehicles in queue. 3) Mid block Section will have 4 lanes with a (painted) median of 3.0 meter wide (lane configuration become 4.2, 3.3, 3.0, 3.3, 4.2). Two lanes are enough for the present volume and median serves as refugee place for left turning vehicles into road side facilities. If volumes increase in the future, 3 lanes will be provided to each direction. Left turn lane at the intersection will be extended to 100 meters on the east side (previously 50 meters) 100 meters on the west side (previously 30 meters). Then maybe a need to study the coordination of the 3 intersection along Sumulong Highway, namely Shoe Ave., Mc Donalds and Tuazon to provide good progression of traffic flow. 		
Enforcement	<ol style="list-style-type: none"> 1) Traffic enforcer should periodically man the intersection to apprehend drivers ignoring the signals. 		

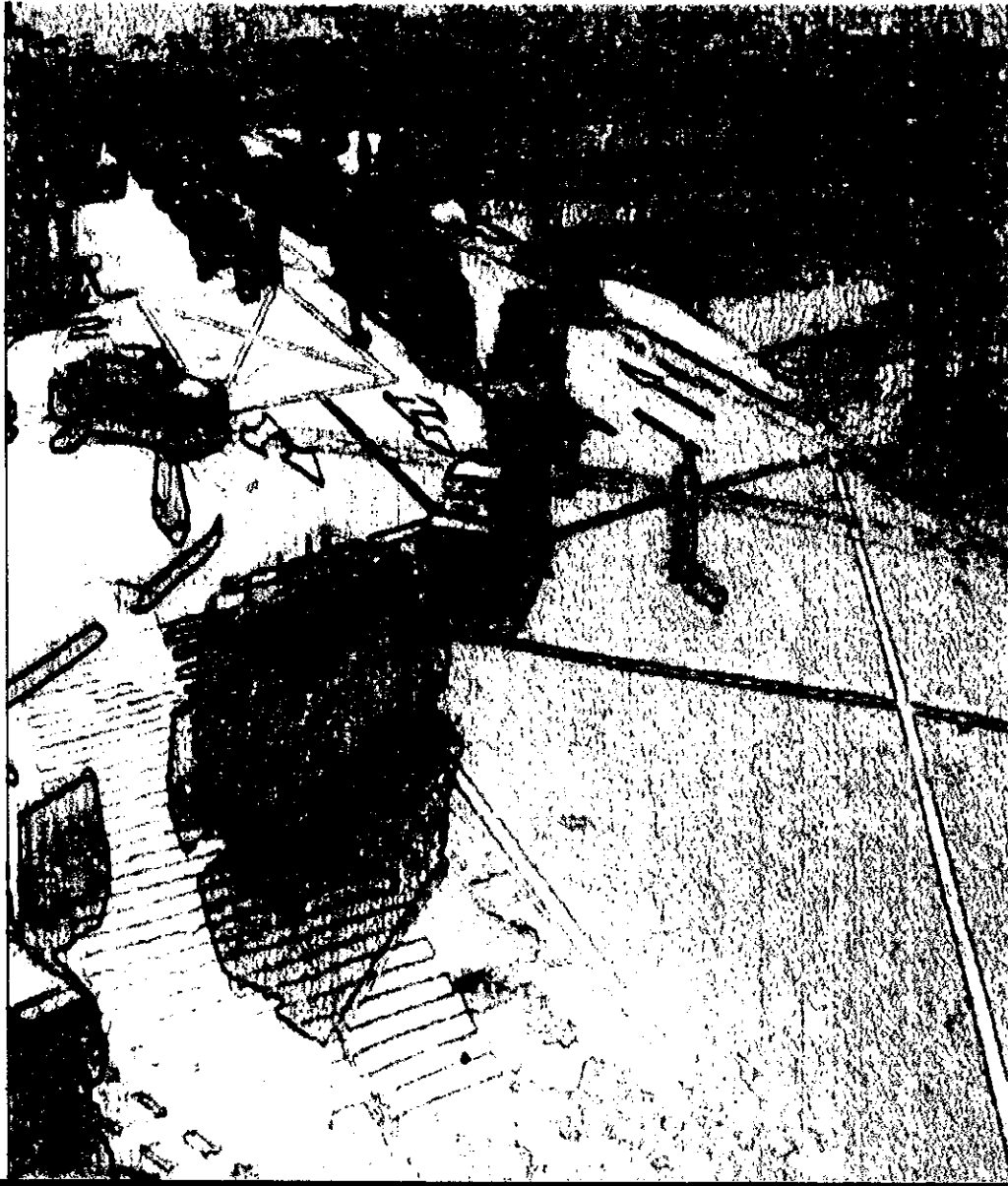


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Small Scale Traffic Improvement Measures for Metro Manila

LOCATION: MR03, J. Sumulong Highway / A. Tuazon Street (MARIKINA)
(cost summary)

A. Pavement Markings	<u>Unit</u>	<u>Quantity</u>	<u>Unit Cost</u>	<u>Total Cost</u>
<i>Longitudinal Lines:</i>				
1. Center Lines				
a) Broken Line, 100 or 150mm width, 3m length, w = 150mm	l.m	140.00	45.00	6,300.00
b) Solid White Lines, 200mm width	l.m	260.00	150.00	39,000.00
2. Lane Lines (100mm or 150mm width)				
a) Solid Lines, w = 150 mm	l.m	120.00	112.50	13,500.00
b) Broken Lines w= 150mm	l.m	850.00	45.00	38,250.00
3. Barrier Lines				
a) Unbroken Double Yellow Lines (100 or 150mm width)	l.m	-	-	-
b) Single Yellow Line with broken White Lines (100-150mm)	l.m	-	-	-
4. Edge Lines				
a) Pavement Edge (Shoulders)	l.m	-	-	-
b) Median Edge	l.m	-	-	-
5. Continuity Line				
a) Continuity Line	l.m	-	-	-
6. Transition Line				
a) Transition Line	l.m	-	-	-
<i>Transverse Lines:</i>				
1. Stop Lines (Solid Lines) white, width = 450 mm	l.m	30.00	337.50	10,125.00
2. Give Way (Yield Lines)	l.m	-	-	-
3. Pedestrian Crossing Markings				
a) Zebra Crossing (Non-Signalized), width = 300mm	l.m	-	-	-
b) Cross Walks (Signalized), width = 300mm	l.m	112.00	225.00	25,200.00
<i>Other Lines:</i>				
1. Turn Lines (broken Lines)	l.m	-	-	-
2. Parking Bay Lines				
a) Parallel Bays, width = 100mm	l.m	-	-	-
b) Angle Bays	l.m	-	-	-
3. Painted Median Islands	l.m	-	-	-
4. BUS and PUJ Lane Markings	l.m	-	-	-
5. Channelized Junction Pavement Marking	l.m	-	-	-
6. Yellow Box Line, w= 150mm	l.m	-	-	-
<i>Other Markings:</i>				
1. Approach Markings to Islands and Obstructions	l.m	18.00	262.50	4,725.00
2. Chevron Markings	l.m	-	-	-
3. Curb Markings for Parking Restrictions	l.m	-	-	-
4. Approach to Railroad Crossings	l.m	-	-	-
<i>Messages and Symbols:</i>				
1) Messages	pcs	-	-	-
2) Symbols				
a) Give Way symbol	pcs	-	-	-
b) Pavement Arrows				
1) Through Arrow = 1.21 sq.m / each	pcs	8.00	907.50	7,260.00
2) Combined Arrow = 2.44 sq.m / each	pcs	8.00	1,830.00	14,640.00
3) Turn Arrow = 1.46 sq. m / each	pcs	2.00	1,095.00	2,190.00
c) Numerals	pcs	-	-	-
B. Signs				
1. No Parking Sign	Units	8.00	2,716.00	21,728.00
2. Pedestrian Crossing Sign	Units	8.00	3,850.00	30,800.00
3. Stop Sign	Units	4.00	2,718.00	10,872.00
4. Directional Sign	Units	-	-	-
C. Other Works				
1. Reprogramming of Traffic Signal	l.s.	-	-	4,000.00
2. Miscellaneous	l.s.	-	-	2,000.00
TOTAL				228,590.00
Contingencies, 5%				11,429.50
CMS, 10%				22,859.00
Miscellaneous (fees, permits, etc), 5%				11,429.50
Govt. Supervision, 2%				4,571.80
TOTAL COST				278,879.80



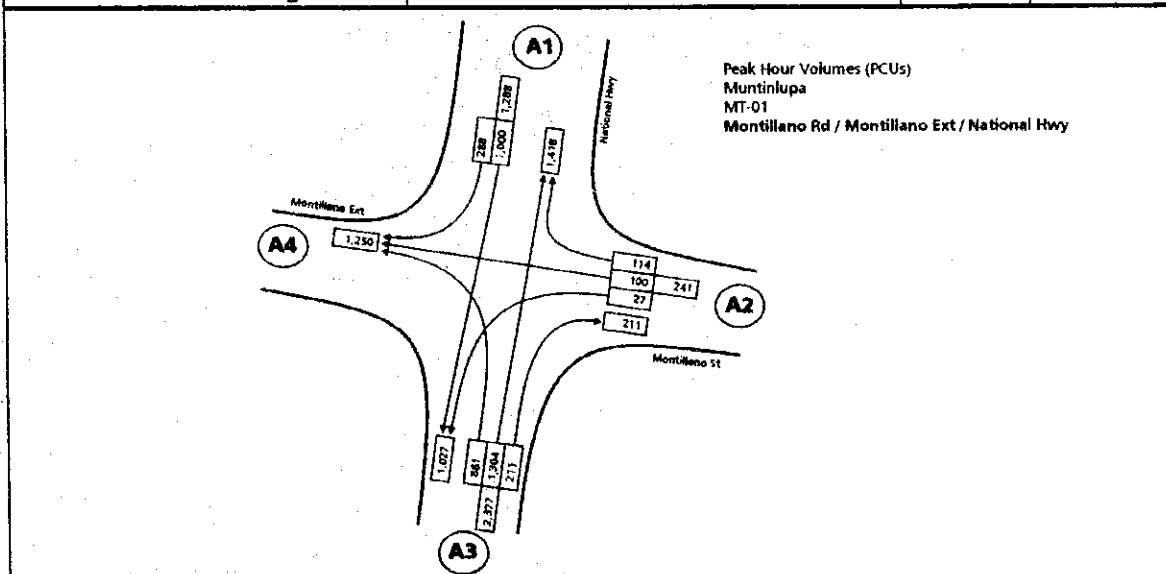
Muntinlupa

Individual Information Sheets for the Traffic Bottleneck Points

- MT-01 Montillano St / Montillano Ext / National Road
- MT-02 Muntinlupa City Hall / MCM Hospital / Bruger Subd
- MT-03 Rizal St / Manila South Road
- MT-04 Susana Heights / Manila South Road

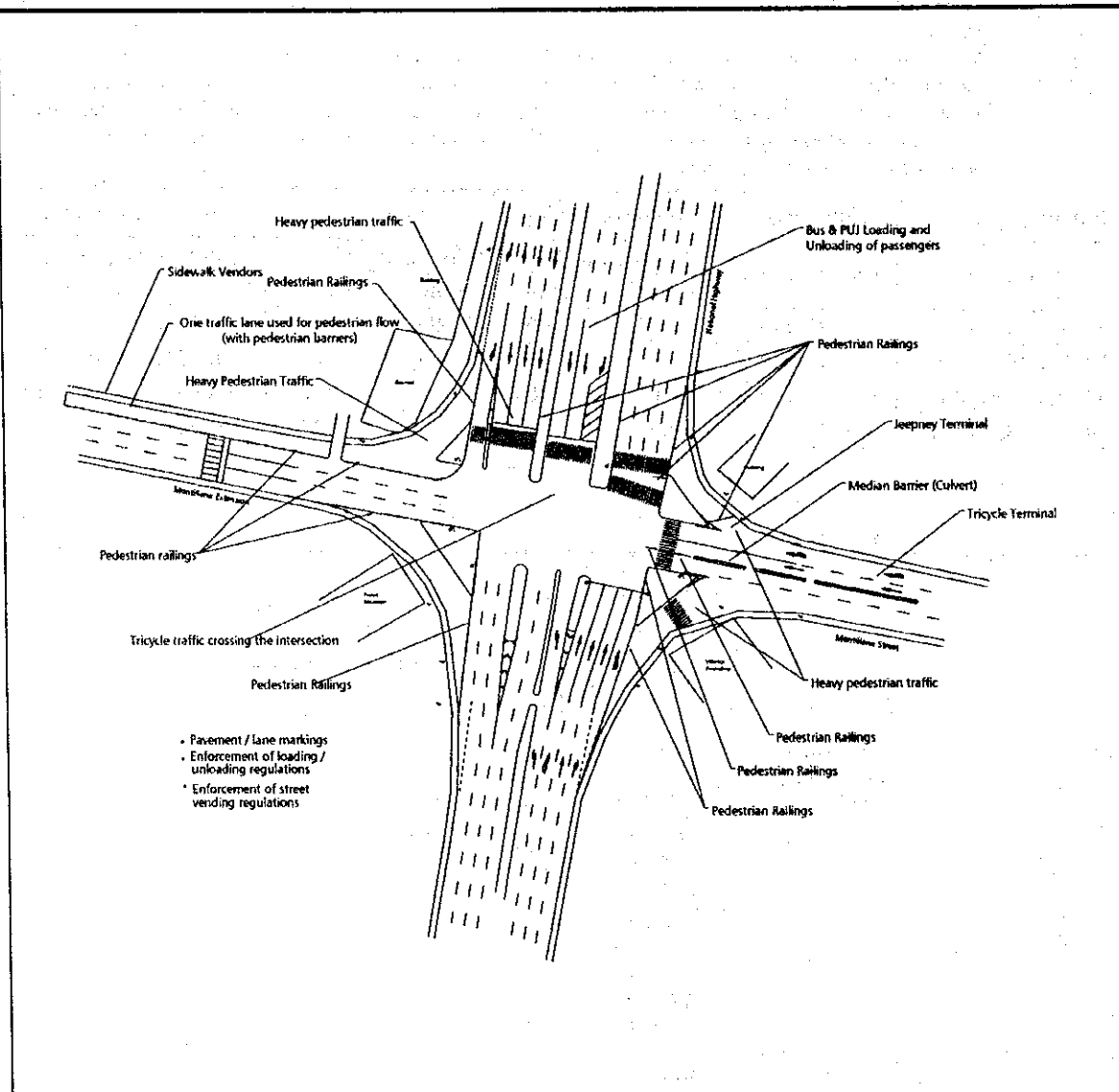


Name	Montillano Rd / Montillano Ext / National Hwy			Code	MT-01		
Sheet	Summary of Observations			LGU	Muntinlupa		
Traffic Conditions	<ol style="list-style-type: none"> Extremely heavy pedestrian volumes crossing the National Road from Montillano Extension to Montillano Street, causing numerous roadside friction. Pedestrian volumes are in the order of 12,000 per hour during peak periods. The Alabang viaduct of the South Luzon Expressway is closed to heavy vehicles. As such, trucks are made to pass at-grade, further complicating traffic flows in the junction. Numerous public transport routes terminate in the vicinity of the intersection, with a very high volume of passengers loading, unloading and transferring. Existing road and sidewalk dimensions favor vehicles more than pedestrians. 						
Physical Conditions	<ol style="list-style-type: none"> A major road intersection under the existing Alabang viaduct providing access to Las Piñas to the west and towards residential areas (near the Laguna de Bay shore) on the eastern part. It is a 4-legged channelized intersection that links the National Road with the South Luzon Expressway. The area is concrete paved in good condition. Montillano St. measures 15.27 meters at the approach and could accommodate a standard 5-lanes carriageway; Montillano Extn has a width of 14.2 meters, sufficient for a standard 4-lane carriageway. The latter is a one-way street leading to the Alabang Town Center area and to Las Piñas. The National Highway, on the other hand, has 4 lanes in each direction divided by a median, where columns of the viaduct are positioned. The intersection's geometric conditions meet design standards and has a traffic signal system installed. Traffic flow is hindered by sidewalk vendors, illegal loading and unloading practices of public utility vehicles and the lack of adequate pedestrian walkways. 						
Signalization	Signalized	Pavement Markings	With markings	Peak	08:00-09:00		
Approach	Dimensions	Peak Hour Traffic Volumes (PCUs)				% Public Transport	Pedestrian Volume
		Left	Through	Right	Total		
A1: Nat'l. Hwy(N)	23.9 m	NA	1000	288	1288	55.20%	Heavy
A2: Montillano (E)	12.6 m	27	100	114	241	48.67%	Very Heavy
A3: Nat'l. Hwy(S)	19 m	861	1304	211	2377	58.68%	Very Heavy
A4: Montillano (W)	15.4 m	NA	NA	NA	NA	NA	Heavy
Total		888	2404	613	3906		
Passenger Flows		15,200					

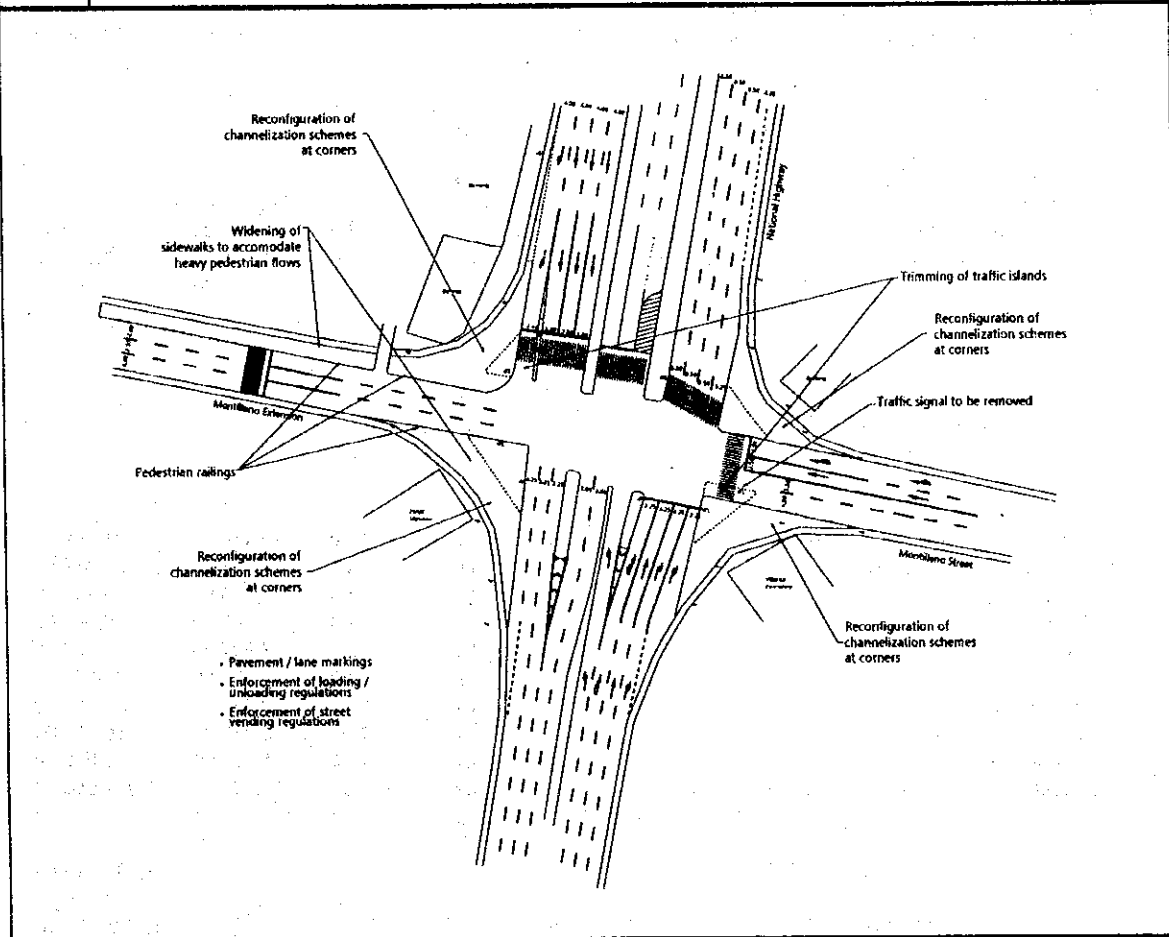


Name	Montillano Rd / Montillano Ext / National Hwy	Code	MT-01
Sheet	Analysis	LGU	Muntinlupa

- 1) Montillano St. (A2) is slightly wider than Montillano Extn (A4). However, the vehicle volumes for A2 are about a third that of A4. A4 will tend to control the speed and flow of east-west traffic.
- 2) The National Highway north approach (A1-A3) has 4 lanes in each direction, divided by a median. Not much can be done about these medians, as the columns of the second level viaduct are positioned here. Existing channelization scheme tends to provide more traffic lanes to A1, however.
- 3) A3 carries heavier volumes than that of A1; hence, A3 will dictate the tempo of north-south traffic. Consequently, it will be fruitless to squeeze one more lane out of A1. To discourage weaving in and out at A1, the extra space at the median should be devoted to pedestrian use.



Name	Montillano Rd / Montillano Ext / National Hwy	Code	MT-01
Sheet	Proposed Improvements	LGU	Muntinlupa
Engineering	<ol style="list-style-type: none"> 1) A smoother flow of vehicles can be achieved by providing more walk spaces for pedestrians and minimizing vehicle-pedestrian conflicts. The four triangular islands at the corners of the intersection shall be reconfigured, and the sidewalks across them devoted for exclusive pedestrian use without cramping the geometry of the curves, to ensure smooth turning maneuvers. 2) Pedestrian railings shall be installed at these curves, to avoid pedestrian overspill on the roadways and for safety considerations. On the roadway itself, lane markings and signages shall be installed to guide motorists. 3) The scheme entails removal of one traffic signal post at A2 (facing A4). This is no longer needed due to one-way operation of A4. From the A1 approach, the signal light post would have to be relocated to make room for the right turn lane. 		
Enforcement	<ol style="list-style-type: none"> 1) The schemes have to be supplemented by active enforcement of loading/unloading regulations, as well as clearing sidewalks and pedestrian paths of obstructions such as ambulant vendors. 2) Strict enforcement of anti-jaywalking regulations. 3) When short-handed, enforcers should give priority to Montillano Extension and the southern leg of the National Highway (A3). 		



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Small Scale Traffic Improvement Measures for Metro Manila

LOCATION : MT-01: Montillano Rd / Montillano Ext. / National Hwy (MUNTINLUPA)
(cost summary based on actual implementation)

A. Pavement Markings	<u>Unit</u>	<u>Quantity</u>	<u>Unit Cost</u>	<u>Total Cost</u>
<i>Longitudinal Lines</i>				
1. Center Lines				
a.) Broken Lines, 100 or 150 mm width, 3m length 4.50 m gaps	l.m.	431.00	90.00	38,790.00
b.) Solid White Lines, 150mm width	l.m.	-	-	-
2. Lane Lines (100 or 150mm width)				
a.) Solid Lines, w = 150mm	l.m.	-	-	-
b.) Broken Lines, w = 150mms, 200mm width	l.m.	-	-	-
3. Barrier Lines				
a.) Unbroken Double Yellow Lines (100 or 150mm width)	l.m.	-	-	-
b.) Single Yellow Line with broken White Lines (100-150mm)	l.m.	-	-	-
4. Edge Lines				
a.) Pavement Edge (Shoulders)	l.m.	-	-	-
b.) Median Edge	l.m.	-	-	-
5. Continuity Lines				
l.m.	l.m.	-	-	-
6. Transition Line				
l.m.	l.m.	-	-	-
<i>Transverse Lines</i>				
1. Stop Lines (Solid Lines) white, width = 450mm	l.m.	86.00	270.00	23,220.00
2. Give Way (Yield Lines)	l.m.	-	-	-
3. Pedestrian Crossing Markings				
a.) Zebra Crossing (Non-Signalized), width = 300mm	l.m.	-	-	-
b.) Cross Walks (Signalized), width = 300mm	l.m.	602.00	180.00	108,360.00
<i>Messages and Symbols</i>				
1. Messages				
pcs.	-	-	-	-
2. Symbols				
a.) Give Way Symbol	pcs.	-	-	-
b.) Pavement Arrows				
1.) Through Arrow = 1.21 sq.m. / each	pcs.	12.00	945.00	11,340.00
2.) Combined Arrow = 2.44 sq.m. / each	pcs.	2.00	1,575.00	3,150.00
3.) Turn Arrow = 1.46 sq.m. / each	pcs.	4.00	1,165.00	4,660.00
c.) Numerals				
B. Signs				
1. Loading/Unloading Sign	pcs.	-	-	-
2. No Loading/Unloading Sign	pcs.	-	-	-
3. No Double Parking Area	pcs.	-	-	-
C. Other Works				
1. Paint Removal of existing markings	l.s	1.00	21,416.00	21,416.00
2. Removal of median island	l.s	1.00	27,467.00	27,467.00
3. Roadway excavation	l.s	1.00	5,750.00	5,750.00
4. Aggregate Sub-base	l.s	1.00	5,963.00	5,963.00
5. Aggregate Base Course	l.s	1.00	7,387.00	7,387.00
6. PCC Pavement	l.s	1.00	98,533.00	98,533.00
7. Curb and Gutter	l.s	1.00	19,050.00	19,050.00
8. Concrete Sidewalk	l.s	1.00	16,415.00	16,415.00
9. Demountable Office	l.s	1.00	11,065.00	11,065.00
10. Supply and Installation of Pedestrian Barriers	pcs.	130.00	10,285.00	1,337,050.00
TOTAL				1,739,616.00
TOTAL COST				1,739,616.00

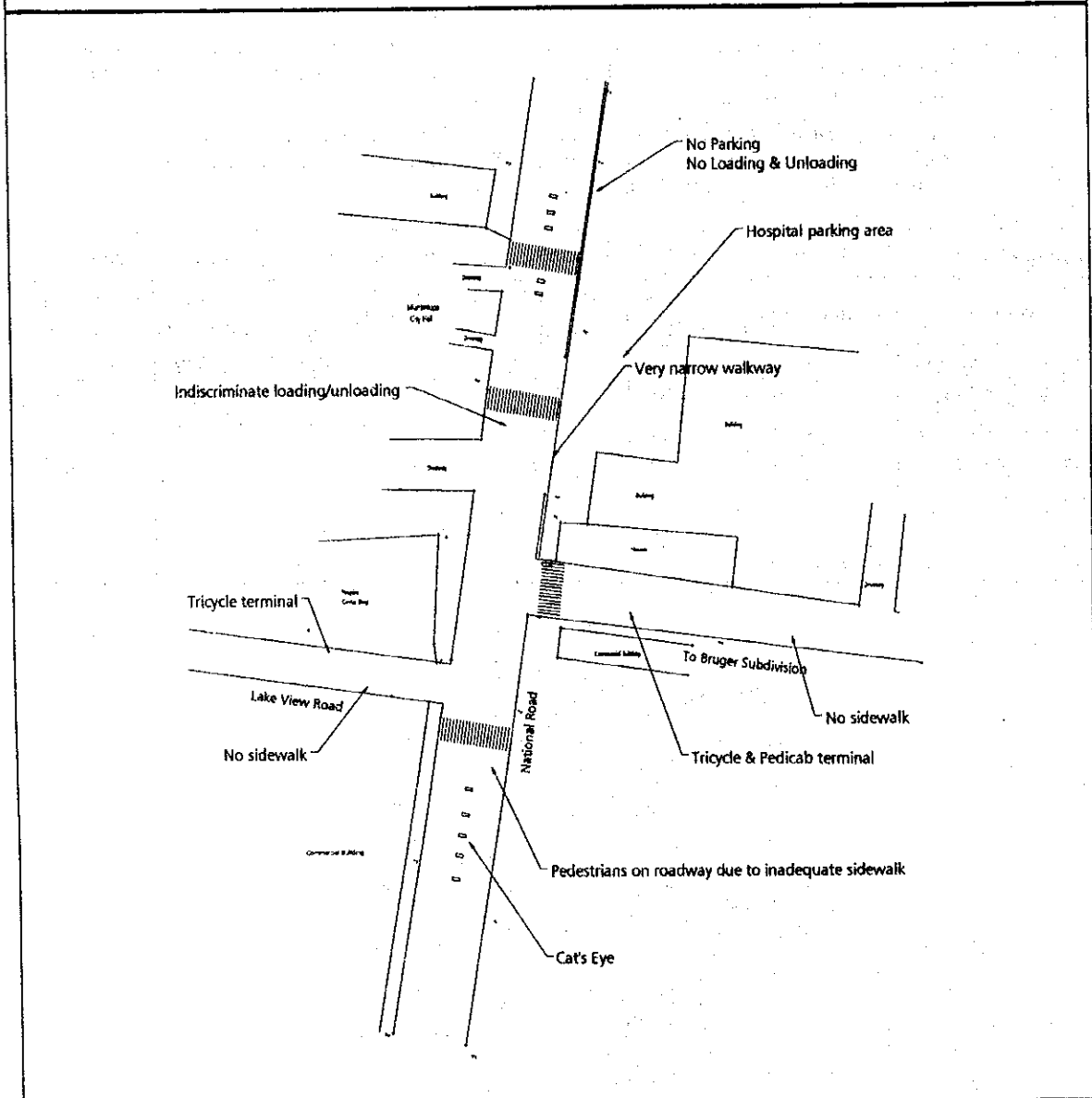
Name	Muntinlupa City Hall / Bruger Subd / MCM Hospital				Code	MT-02	
Sheet	Summary of Observations				LGU	Muntinlupa	
Traffic Conditions	<ol style="list-style-type: none"> 1) Presence of institutional facilities such as the Muntinlupa City Hall and the MCM Hospital on opposite sides of the highway generate high levels of pedestrian and commuter traffic. 2) Very narrow sidewalk for pedestrians, 3) Offset nature of Bruger Subdivision access road and Lakeview road present conflicts for left turning vehicles. 4) No designated loading/unloading facilities which will not hamper through traffic flow; 5) Presence of commercial establishments serving patrons of institutional centers further generates traffic demand. 						
	Physical Conditions	<ol style="list-style-type: none"> 1) A complex intersection involving two local roads offset at a significant distance from their centers. 2) The local roads serve residents at nearby subdivisions and other barangays in the poblacion area. The main road is a National Road with four undivided lanes and paved with concrete surfacing in fair condition. 3) The main physical constraint of the bottleneck point is the offset situation of the local roads. Traffic movement is also greatly affected by vehicles turning to the local roads due to the inadequate turning radius of the pavement corners. 					
Signalization		None	Pavement Markings	With markings	Peak	08:00-09:00	
Approach	Dimensions	Peak Hour Traffic Volumes (PCUs)				% Public Transport	Pedestrian Volume
		Left	Through	Right	Total		
A1: Nat'l. Hwy (N)	13 m	56	968	40	1064	50.97%	Moderate
A2: Bruger Sudb	9 m	51	5	38	94	28.18%	Light
A3: Nat'l. Hwy (S)	13 m	35	897	52	984	54.05%	Moderate
A4: Lakeviews	7 m	104	18	48	169	30.57%	Light
A5: City Hall		30	16	28	73		
Total		276	1,904	206	2,384		
Passenger Flows				8,900			
<p>Peak Hour Volumes (PCUs) Muntinlupa MT-02 Muntinlupa City Hall / Bruger Subd / MCM Hospital</p>							

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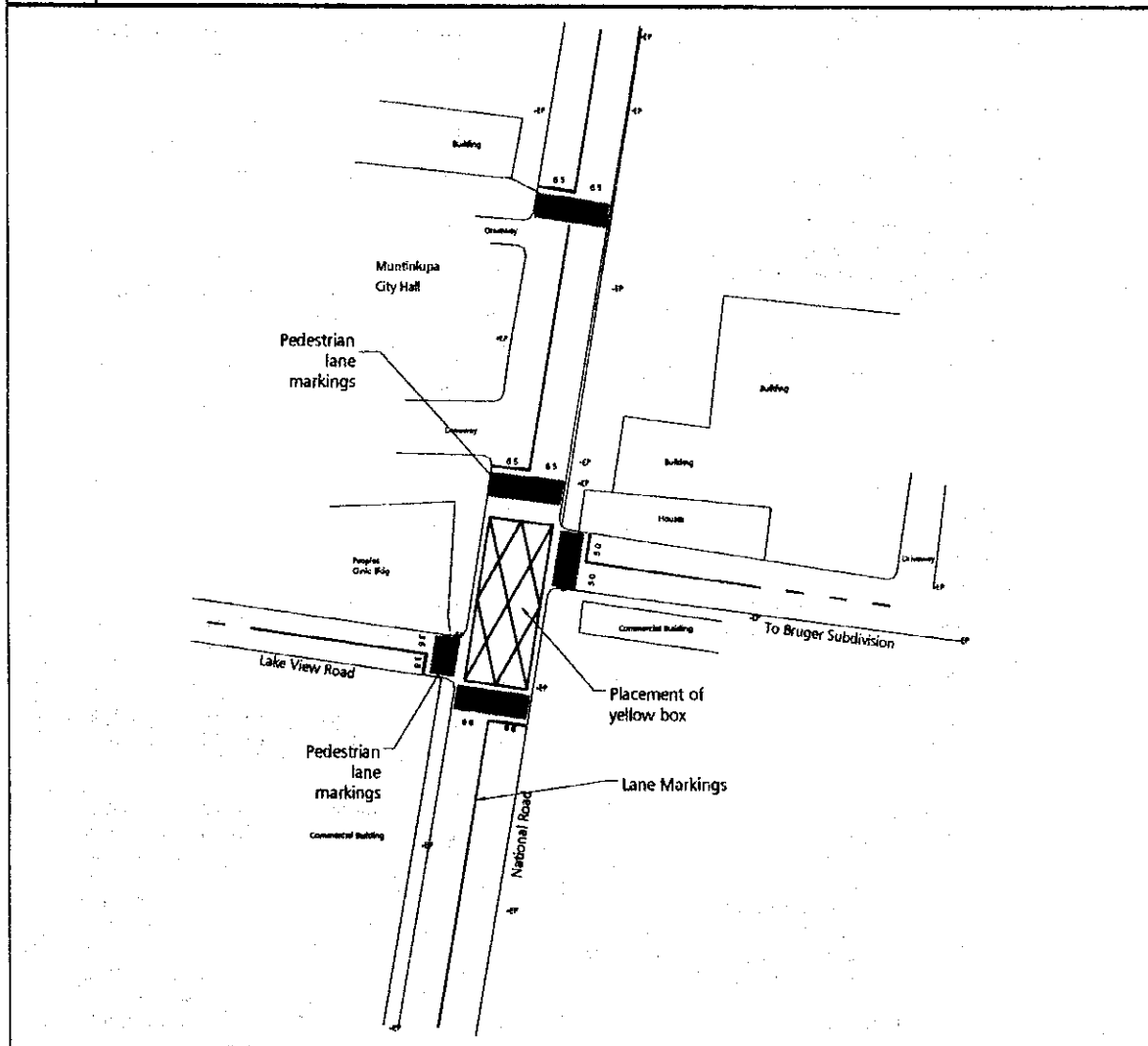
Small Scale Traffic Improvement Measures for Metro Manila

Name	Muntinlupa City Hall / Bruger Subd / MCM Hospital	Code	MT-02
Sheet	Analysis	LGU	Muntinlupa

- 1) Main cause of bottleneck is the presence of two large institutional facilities in the area: the Muntinlupa City Hall and the MCM Hospital. Both generate a high volume of vehicle trips, as well as person trips.
- 2) Junction is complicated by the offset nature of the two roads intersecting the Manila South Road: the road leading to Bruger Subdivision and the one leading to Lakeview Subdivision.
- 3) Vehicles accessing the City Hall parking area often cannot proceed smoothly into the driveway unobstructed. While waiting they obstruct vehicles going through along MSR.
- 4) Patrons of the different institutions and establishments who take public transport do not observe proper loading/unloading practices, and jeepneys waiting for passengers or loading/unloading passengers often block through traffic.



Name	Muntinlupa City Hall / Bruger Subd / MCM Hospital	Code	MT-02
Sheet	Proposed Improvements	LGU	Muntinlupa
Engineering	<ol style="list-style-type: none"> 1) Installation / application of pavement markings, such as road centerlines, pedestrian crossings, stop lines and lane designations, to guide motorist. 2) Road signages to inform motorist and pedestrians about restrictions on parking and loading/unloading. 3) Yellow box from Lakeview road to Bruger Road. 		
Enforcement	<ol style="list-style-type: none"> 1) Compel pedestrians to cross only at zebra crossings and at proper time. 2) Ban parking along Manila South Road, from Lakeview to MCH driveway. 3) Enforce loading/unloading restrictions at corners (particularly) 4) Deploy enforcers to oversee phasing of movements, treating Lakeview and MCH driveway as one road. 		



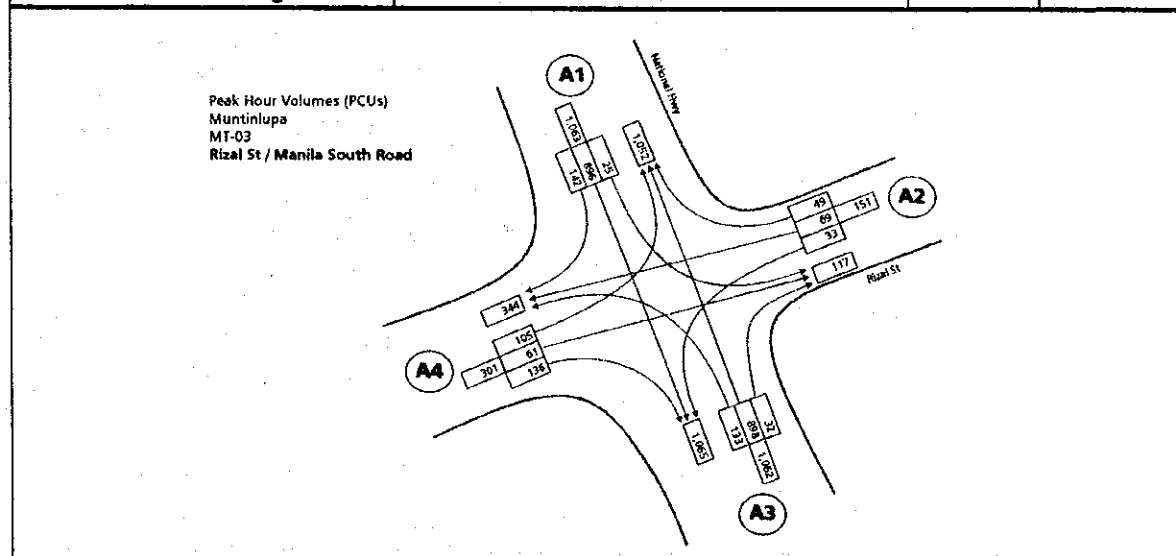
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Small Scale Traffic Improvement Measures for Metro Manila

LOCATION: MT-02 : Muntinlupa City Hall / Bruger Subd. / MCM Hosp. (MUNTINLUPA)
(cost summary)

A. Pavement Markings:	<u>Unit</u>	<u>Quantity</u>	<u>Unit Cost</u>	<u>Total Cost</u>
<i>Longitudinal Lines:</i>				
1. Center Lines				
a) Broken Line, 100 or 150mm width, 3m length	l.m	210.00	45.00	9,450.00
b) Solid White Lines, 150 width	l.m	234.00	112.50	26,325.00
2. Lane Lines (100mm or 150mm width)				
a) Solid Lines, w = 150 mm	l.m	-	112.50	-
b) Broken Lines w= 150mm	l.m	-	45.00	-
3. Barrier Lines				
a) Unbroken Double Yellow Lines (100 or 150mm width)	l.m	-	-	-
b) Single Yellow Line with broken White Lines (100-150mm)	l.m	-	-	-
4. Edge Lines				
a) Pavement Edge (Shoulders)	l.m	-	-	-
b) Median Edge	l.m	-	-	-
5. Continuity Line	l.m	-	-	-
6. Transition Line	l.m	-	-	-
<i>Transverse Lines:</i>				
1. Stop Lines (Solid Lines) white, width = 450 mm	l.m	28.20	337.50	9,517.50
2. Give Way (Yield Lines)	l.m	-	-	-
3. Pedestrian Crossing Markings				
a) Zebra Crossing (Non-Signalized), width = 300mm	l.m	360.00	225.00	81,000.00
b) Cross Walks (Signalized), width = 300mm	l.m	-	225.00	-
<i>Other Lines:</i>				
1. Turn Lines (broken Lines)	l.m	-	-	-
2. Parking Bay Lines				
a) Parallel Bays, width = 100mm	l.m	-	75.00	-
b) Angle Bays	l.m	-	-	-
3. Painted Median Islands	l.m	-	-	-
4. BUS and PUJ Lane Markings	l.m	-	-	-
5. Channelized Junction Pavement Marking	l.m	-	-	-
6. Yellow Box Line, w= 150mm	l.m	200.71	112.50	22,579.88
<i>Other Markings:</i>				
1. Approach Markings to Islands and Obstructions	l.m	-	-	-
2. Chevron Markings	l.m	-	-	-
3. Curb Markings for Parking Restrictions	l.m	-	262.50	-
4. Loading/Unloading Line Zone (200mm)	l.m	-	150.00	-
<i>Messages and Symbols:</i>				
1) Messages	pcs	-	-	-
2) Symbols				
a) Give Way symbol	pcs	-	-	-
b) Pavement Arrows				
1) Through Arrow = 1.21 sq.m / each	pcs	-	907.50	-
2) Combined Arrow = 2.44 sq.m / each	pcs	-	1,830.00	-
3) Turn Arrow = 1.46 sq. m / each	pcs	-	1,095.00	-
c) Numerals	pcs	-	-	-
B. Signs				
1. No Loading / Unloading	pcs	4.00	3,850.00	15,400.00
2. No Parking Sign	pcs	4.00	3,850.00	15,400.00
C. Other Works				
1. Removal of Pavement Markings	l.m.	764.00	75.00	57,300.00
2. Relocate pedestrian signal	pc.	1.00	1,500.00	1,500.00
TOTAL				238,472.38
Contingencies, 5%				11,923.62
CMS, 10%				23,847.24
Miscellaneous (fees, permits, etc), 5%				11,923.62
Govt. Supervision, 2%				4,769.45
TOTAL COST				290,936.30

Name	Rizal St / Manila South Road		Code	MT-03			
Sheet	Summary of Observations		LGU	Muntinlupa			
Traffic Conditions	<p>1) Rizal Street is the cross street from the Manila South Road (National Highway) leading to the New Bilibid Prisons (National Penitentiary) and residential areas surrounding the compound. For these areas, Rizal Street is the only link with the Manila South Road.</p> <p>2) The Manila South Road used to be the main link between southern Metro Manila and provinces to the south such as Laguna, Batangas and Quezon. With the opening of the South Luzon Expressway catering to long-distance trips, the Manila South Road's present functions are mainly for local (short-distance) trips, as well as a main link for public transport between these southern areas and Alabang.</p> <p>3) Numerous roadside business establishments such as eateries and service shops characterize the junction.</p> <p>4) The main mode of public transport linking Bilibid with the national road is the tricycle, with on-street terminals along the width of Rizal Street.</p> <p>5) A number of institutional facilities such as the Muntinlupa Public Library and the barangay hall are also located near the junction.</p>						
	<p>Physical Conditions</p> <p>1) The Manila South Road is a 4-lane undivided arterial highway linking Metro Manila with Laguna and other provinces to the south. Its carriageway is about 12 meters wide</p> <p>2) Rizal Street has a width of about 6 meters. It is asphalt-paved in fair condition. Numerous contributors to roadside friction abound. There are some potholes along Rizal Street.</p> <p>3) The approaches to the west (A4) have triangular corner islands.</p> <p>4) There are pavement markings such as stop lines, pedestrian crossings, and a "yellow box".</p> <p>5) A temporary median barrier was installed at the center of Manila South Road approaching the intersection.</p>						
Signalization	None	Pavement Markings	With markings	Peak 08:00-09:00			
Approach	Dimensions	Peak Hour Traffic Volumes (PCUs)				% Public Transport	Pedestrian Volume
		Left	Through	Right	Total		
A1: Nat'l Hwy (N)	27.6m	25	896	142	1,063	56.23%	Moderate
A2: Rizal St (E)	32.2m	33	69	49	151	51.60%	Light
A3: Nat'l Hwy (S)	27.2m	133	898	32	1,062	51.62%	Moderate
A4: Rizal St (W)	32.2m	105	61	136	301	47.59%	Moderate
Total		296	1,924	359	2,577		
Passenger Flows							

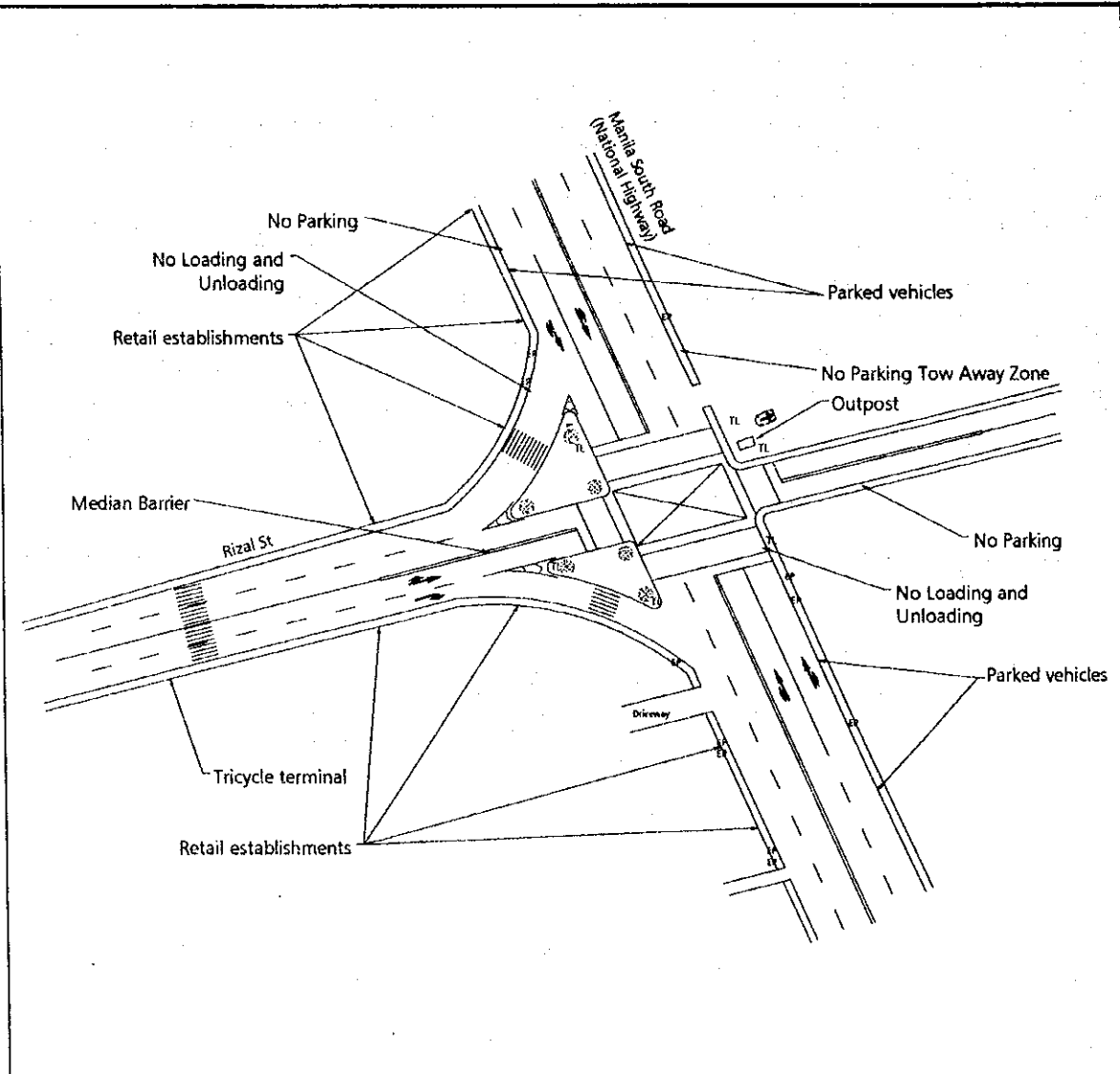


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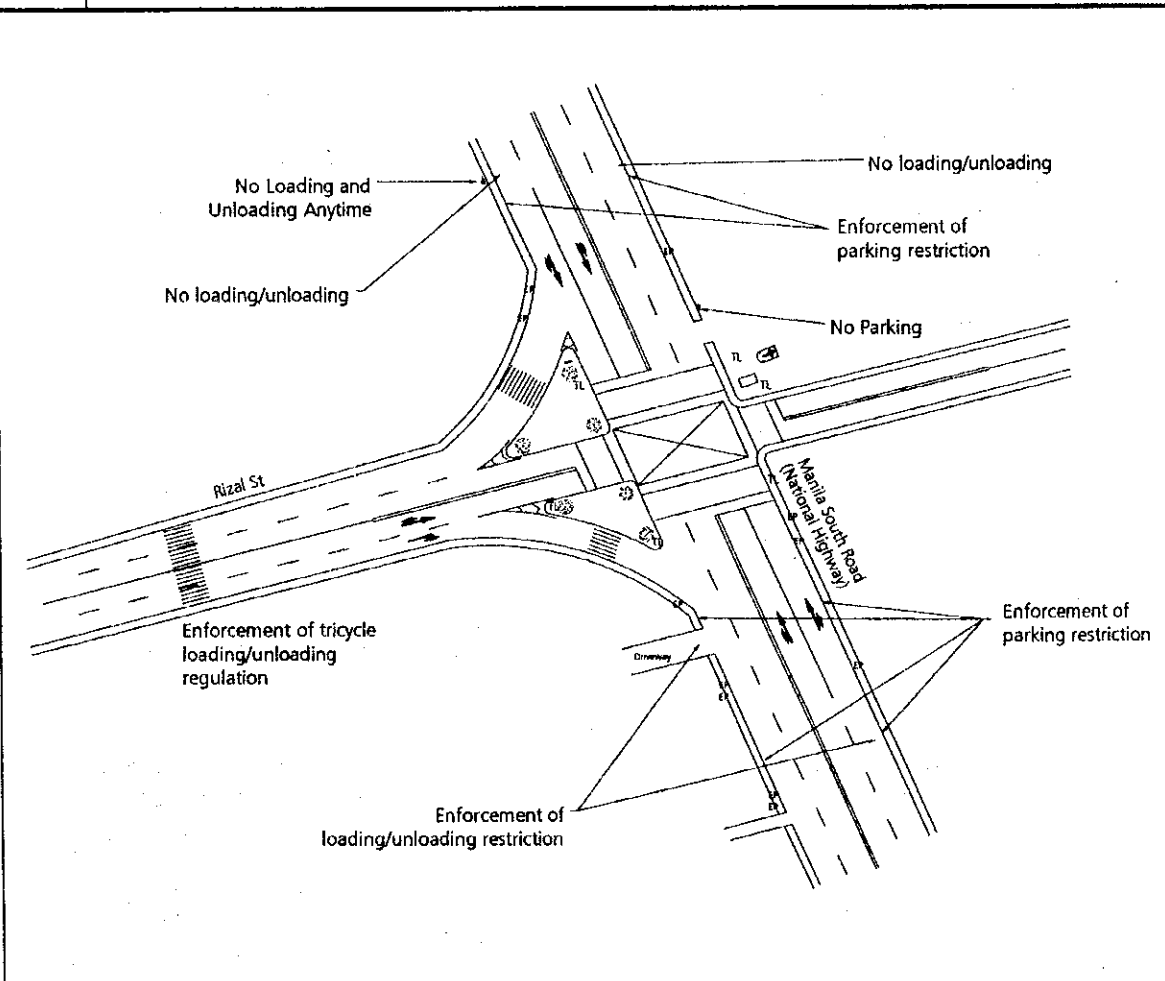
Small Scale Traffic Improvement Measures for Metro Manila

Name	Rizal St / Manila South Road	Code	MT-03
Sheet	Analysis	LGU	Muntinlupa

- 1) The peak volume of vehicle traffic along Manila South Road is more than 1,000 pcus per direction. Traffic along Rizal St is more than 300 pcus per direction, but only less than 20% is through traffic (A2 to A4 or A4 to A2). That means 80% of traffic along Rizal Street comes from turning vehicles to/from Manila South Road. This does not include tricycles terminating and making U-turns along Rizal St.
- 2) The Manila South Road could not accommodate a separate turning lane due to its constricted width. Measures to ease congestion of through traffic along the Manila South Road, particularly for the northbound direction, lie in reducing roadside friction, such as parked vehicles and public transport loading/unloading right at the junction.
- 3) Presence of pavement markings and "islands" indicate that this intersection has been subjected to traffic engineering measures in the past.



Name	Rizal St / Manila South Road	Code	MT-03
Sheet	Proposed Improvements	LGU	Muntinlupa
Engineering	<ol style="list-style-type: none"> 1) Provision of safer, more visible and more permanent median barrier along Manila South Road, although it should not occupy too wide a space that would decrease available road width. 2) Other key improvements lie more in enforcement measures rather than in engineering measures. 		
Enforcement	<ol style="list-style-type: none"> 1) Enforcement of tricycle ban along national highways (Manila South Road). 2) Clearing of sidewalk obstructions. 3) Enforcement of anti-jaywalking regulations. 4) Banning of parking along Manila South Road approaching the junction. 5) Enforcement of loading/unloading regulations: jeepneys should not load/unload passengers at least 15 meters before/after the junction. 		



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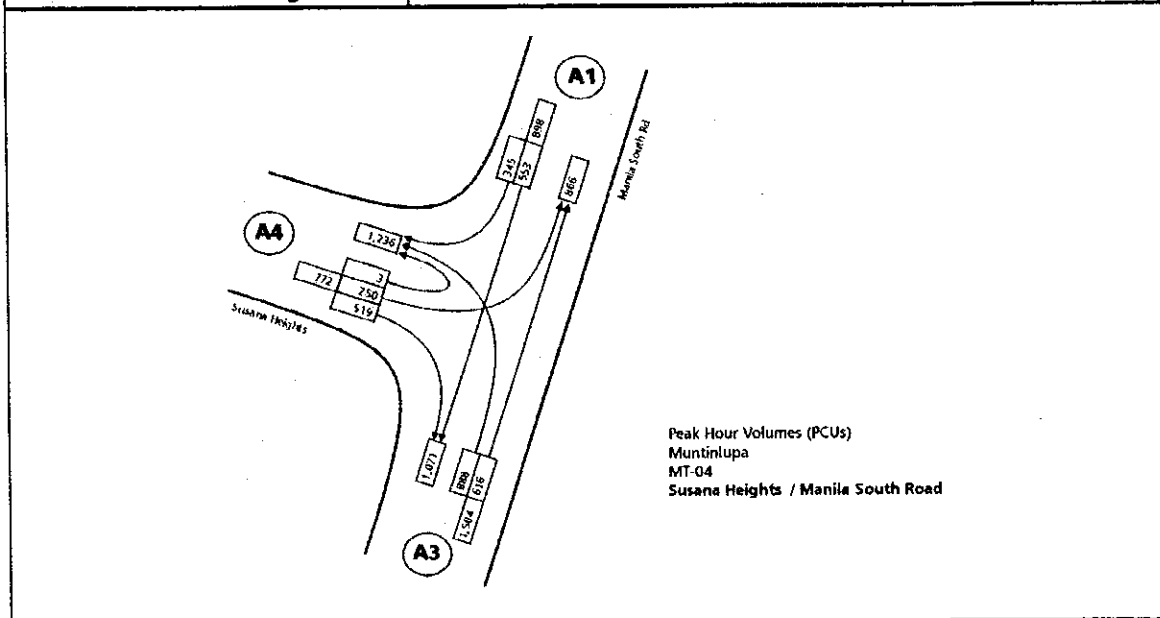
Small Scale Traffic Improvement Measures for Metro Manila

LOCATION: MT-03 : Rizal St. / Manila South Road (MUNTINLUPA)
(cost summary)

A. Pavement Markings:	<u>Unit</u>	<u>Quantity</u>	<u>Unit Cost</u>	<u>Total Cost</u>
<i>Longitudinal Lines:</i>				
1. Center Lines				
a) Broken Line, 100 or 150mm width, 3m length	l.m	280.00	45.00	12,600.00
b) Solid White Lines, 150 width	l.m	120.00	112.50	13,500.00
2. Lane Lines (100mm or 150mm width)				
a) Solid Lines, w = 150 mm	l.m	-	112.50	-
b) Broken Lines w= 150mm	l.m	-	45.00	-
3. Barrier Lines				
a) Unbroken Double Yellow Lines (100 or 150mm width)	l.m	-	-	-
b) Single Yellow Line with broken White Lines (100-150mm)	l.m	-	-	-
4. Edge Lines				
a) Pavement Edge (Shoulders)	l.m	-	-	-
b) Median Edge	l.m	-	-	-
5. Continuity Line				
a) Continuity Line	l.m	-	-	-
6. Transition Line				
a) Transition Line	l.m	-	-	-
<i>Transverse Lines:</i>				
1. Stop Lines (Solid Lines) white, width = 450 mm	l.m	24.00	337.50	8,100.00
2. Give Way (Yield Lines)	l.m	-	-	-
3. Pedestrian Crossing Markings				
a) Zebra Crossing (Non-Signalized), width = 300mm	l.m	76.00	225.00	17,100.00
b) Cross Walks (Signalized), width = 300mm	l.m	94.00	225.00	21,150.00
<i>Other Lines:</i>				
1. Turn Lines (broken Lines)	l.m	-	-	-
2. Parking Bay Lines				
a) Parallel Bays, width = 100mm	l.m	-	75.00	-
b) Angle Bays	l.m	-	-	-
3. Painted Median Islands				
a) Painted Median Islands	l.m	-	-	-
4. BUS and PUJ Lane Markings				
a) BUS and PUJ Lane Markings	l.m	-	-	-
5. Channelized Junction Pavement Marking				
a) Channelized Junction Pavement Marking	l.m	-	-	-
6. Yellow Box Line, w= 150mm	l.m	183.00	112.50	20,587.50
<i>Other Markings:</i>				
1. Approach Markings to Islands and Obstructions	l.m	-	-	-
2. Chevron Markings	l.m	-	-	-
3. Curb Markings for Parking Restrictions	l.m	-	262.50	-
4. Loading/Unloading Line Zone (200mm)	l.m	-	150.00	-
<i>Messages and Symbols:</i>				
1) Messages	pcs	-	-	-
2) Symbols				
a) Give Way symbol	pcs	-	-	-
b) Pavement Arrows				
1) Through Arrow = 1.21 sq.m / each	pcs	-	907.50	-
2) Combined Arrow = 2.44 sq.m / each	pcs	-	1,830.00	-
3) Turn Arrow = 1.46 sq. m / each	pcs	-	1,095.00	-
c) Numerals	pcs	-	-	-
B. Signs				
1. No Loading / Unloading	pcs	4.00	3,850.00	15,400.00
2. No Parking Sign	pcs	5.00	3,850.00	19,250.00
3. Tricycle Loading / Unloading Sign	pcs	1.00	3,850.00	3,850.00
C. Other Works				
1. Removal of Pavement Markings	l.m.	764.00	75.00	57,300.00
2. Relocate pedestrian signal	pc.	1.00	1,500.00	1,500.00
TOTAL				190,337.50
Contingencies, 5%				9,516.88
CMS, 10%				19,033.75
Miscellaneous (fees, permits, etc), 5%				9,516.88
Govt. Supervision, 2%				3,806.75
TOTAL COST				232,211.75

Name	Susana Heights / Manila South Road	Code	MT-04
Sheet	Summary of Observations	LGU	Muntinlupa
Traffic Conditions	<p>1) Susana Heights Road is a main east-west link between the Manila South Road and the South Luzon Expressway. Motorists from residential areas in Laguna's first district, as well as buses serving these areas, use Susana Heights Road in accessing the South Luzon Expressway. As such, there is a high volume of turning vehicles.</p> <p>2) The conflicting turning maneuvers and the high volume of traffic mainly causes congestion. Signal timing may not be optimized to adapt to volume fluctuations during the day.</p>		
Physical Conditions	<p>1) Manila South Road is concrete-paved in good condition, with a carriageway width of 14 meters.</p> <p>2) Susana Heights Road is a 4-lane (~7m per direction) concrete paved road with median barrier / planting strip.</p> <p>3) Junction is signalized. There are no pavement markings clearly visible.</p>		

Signalization	Signalized	Pavement Markings	None	Peak	18:00-19:00		
Approach	Dimensions	Peak Hour Traffic Volumes (PCUs)				% Public Transport	Pedestrian Volume
		Left	Through	Right	Total		
A1: Manila South Rd	14m	NA	553	345	898	42.21%	Light
A2: None	None	None	None	None	None	None	None
A3: Manila South Rd	14.3m	888	616	NA	1,504	44.94%	Light
A4: Susana Heights	16.5m	253	NA	519	772	14.29%	Light
Total		1,141	1,149	864	3,174		
Passenger Flows							

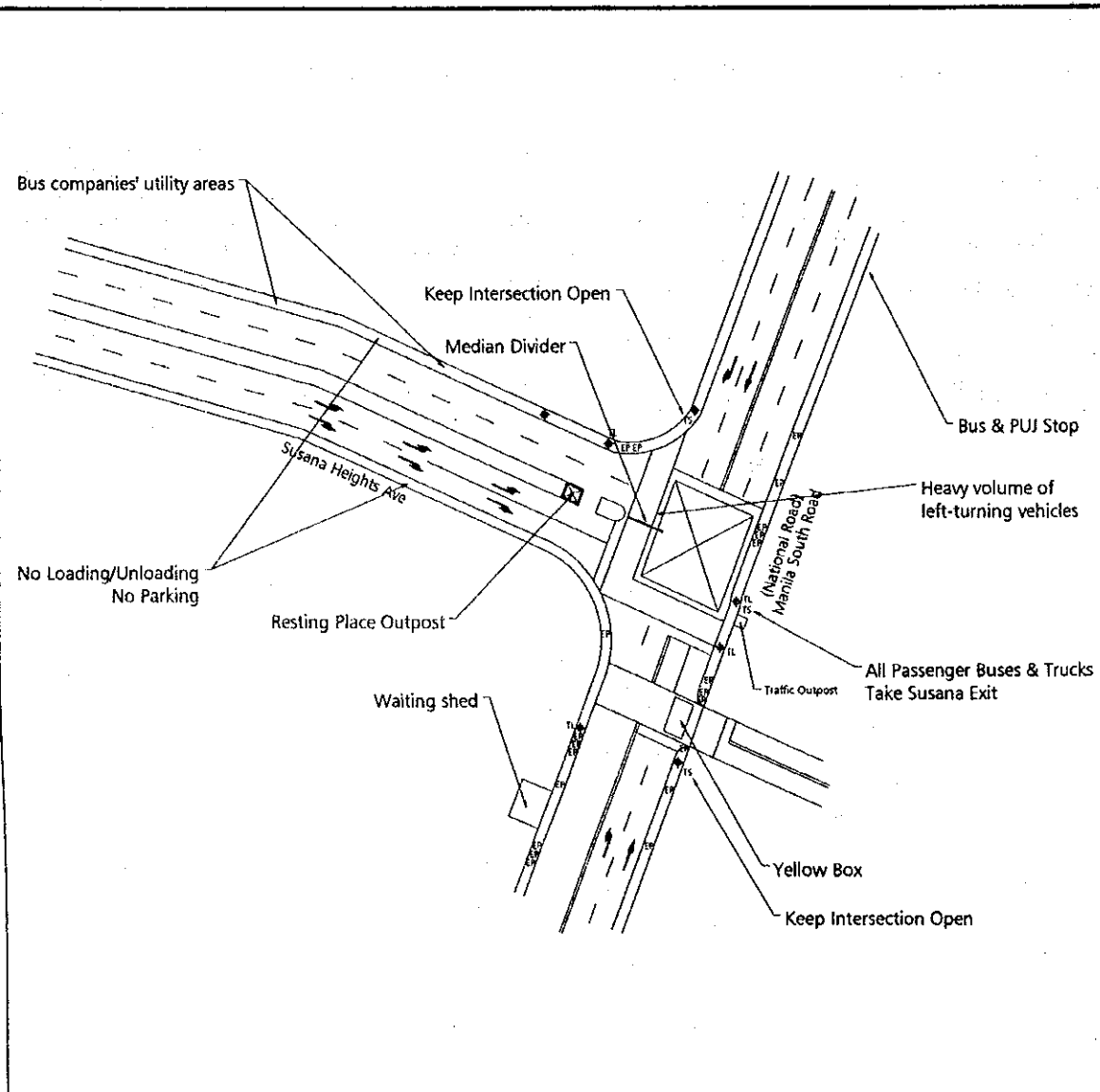


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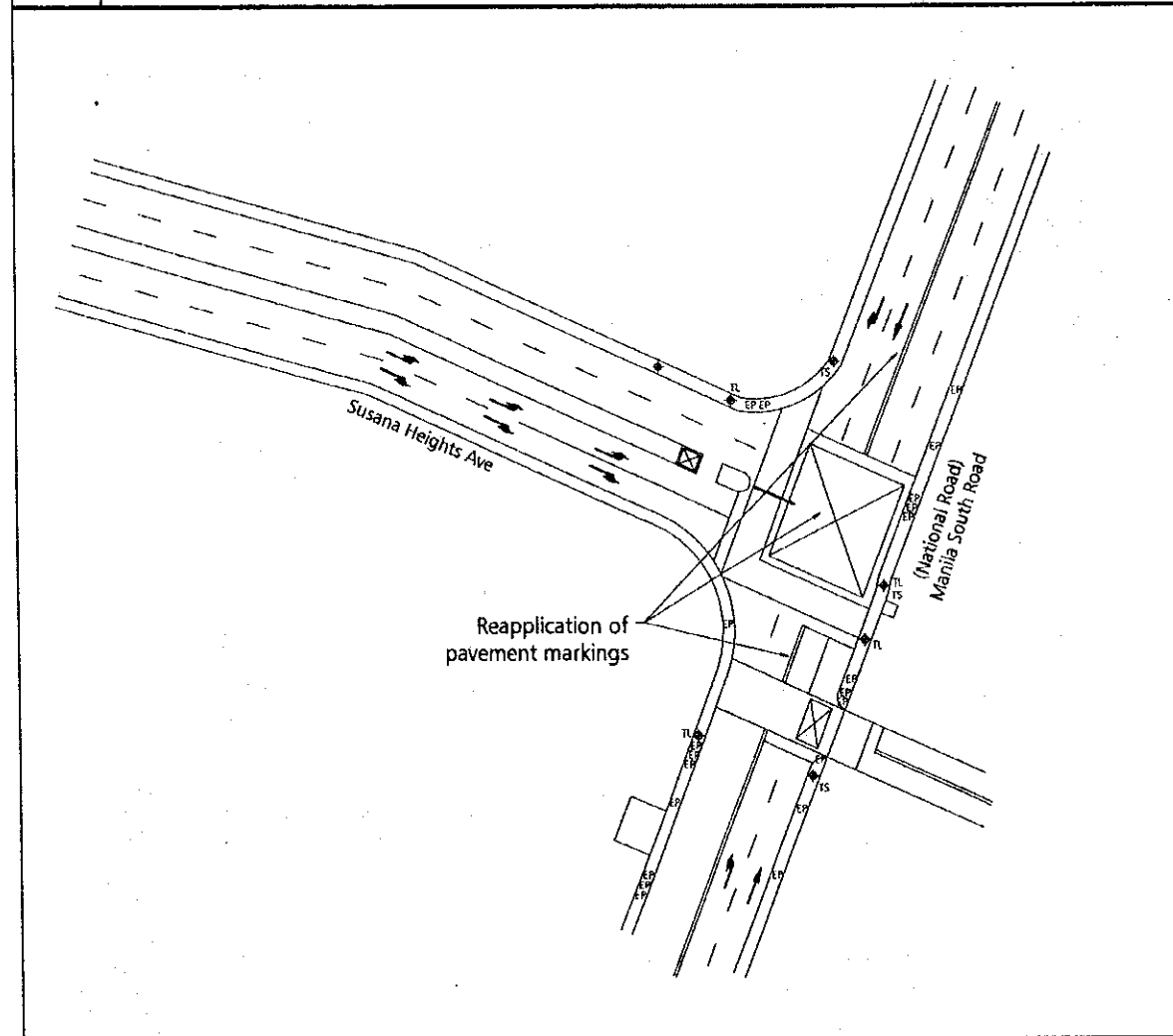
Small Scale Traffic Improvement Measures for Metro Manila

Name	Susana Heights / Manila South Road	Code	MT-04
Sheet	Analysis	LGU	Muntinlupa

- 1) Susana Heights road links the Manila South Road with the South Luzon Expressway at the Susana Heights Interchange. It is the interchange right before the Filinvest Interchange in Alabang coming from the south. A big volume of vehicles coming from the south turn left at the junction to avoid congestion along the Manila South Road north of the junction, as well as congestion at the Alabang area.
- 2) Left turning vehicles (from A3 to A4) comprise about 60% of total northbound traffic along Manila South Road (in PCUs). And while there is a sign prohibiting buses from turning to Susana Heights, the route is being used by a number of buses.
- 3) The key measures should give preference to this high proportion of left turn traffic from A3. These include reserving the inner northbound lane approaching the junction exclusively for left turn traffic, as well as new pavement markings to guide turning vehicles.



Name	Susana Heights / Manila South Road	Code	MT-04
Sheet	Proposed Improvements	LGU	Muntinlupa
Engineering	<ol style="list-style-type: none"> 1) Application of new pavement markings for the junction: centerline markings, pedestrian crossings, and directional arrows. 2) Designation of inner lane of Manila South Road northbound for exclusive left turn traffic, with proper markings and signages. 3) Optimization of signal timing. 		
Enforcement	<ol style="list-style-type: none"> 1) Enforcement of parking restrictions along all approaches to the junction, for lengths of 20 meters from tangent point of turning curb and edge of carriageway. This prohibition shall include the turning curb. 2) Designation of loading/unloading areas away from the junction; supported by persistent enforcement and position of penalties to violators. 		

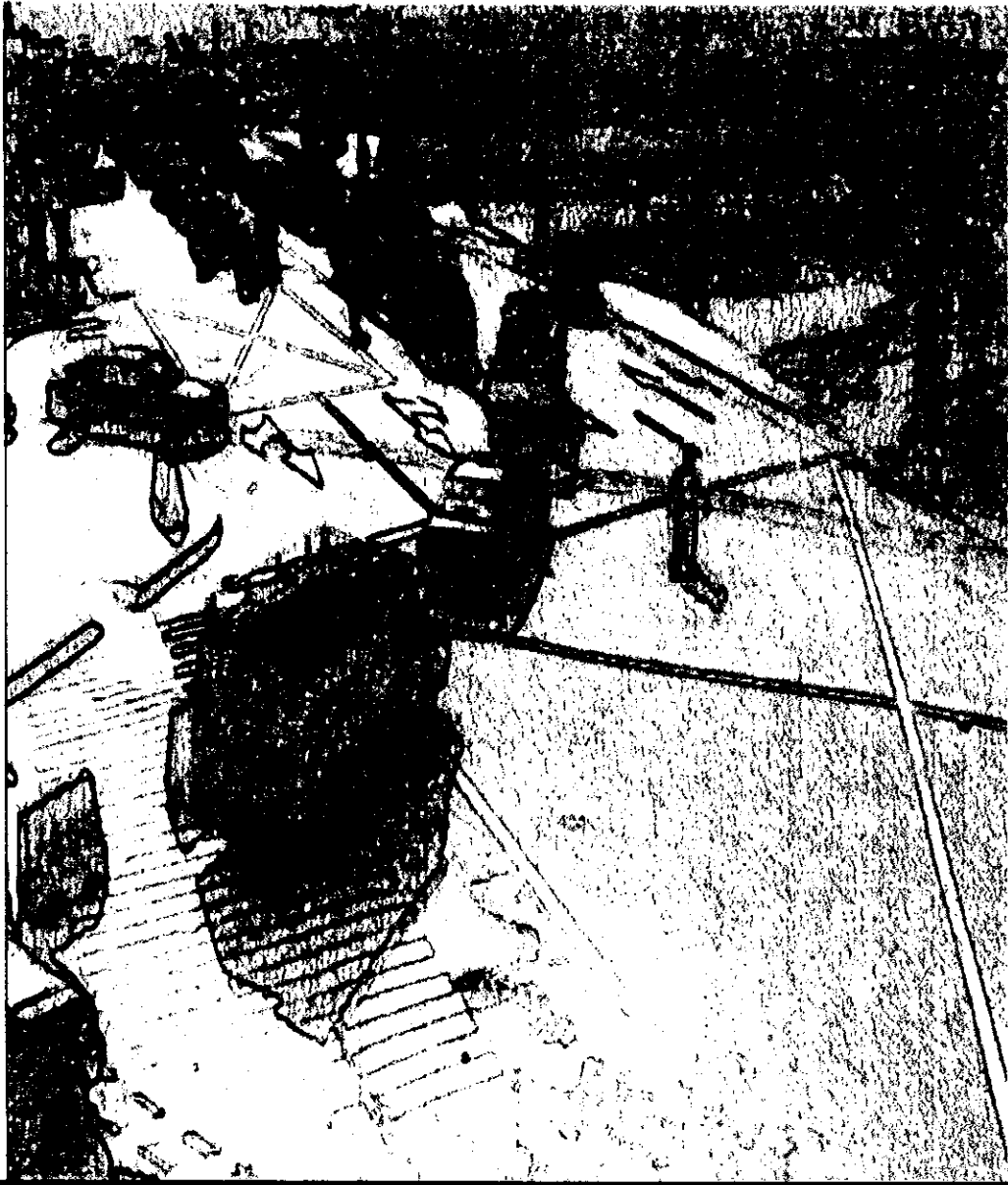


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Small Scale Traffic Improvement Measures for Metro Manila

LOCATION: MT-04 : Susana Heights / Manila South Road (MUNTINLUPA)
(cost summary)

A. Pavement Markings:	<u>Unit</u>	<u>Quantity</u>	<u>Unit Cost</u>	<u>Total Cost</u>
<i>Longitudinal Lines:</i>				
1. Center Lines				
a) Broken Line, 100 or 150mm width, 3m length	l.m	-	45.00	-
b) Solid White Lines, 150 width	l.m	200.00	112.50	22,500.00
2. Lane Lines (100mm or 150mm width)				
a) Solid Lines, w = 150 mm	l.m	90.00	112.50	10,125.00
b) Broken Lines w= 150mm	l.m	510.00	45.00	22,950.00
3. Barrier Lines				
a) Unbroken Double Yellow Lines (100 or 150mm width)	l.m	-	-	-
b) Single Yellow Line with broken White Lines (100-150mm)	l.m	-	-	-
4. Edge Lines				
a) Pavement Edge (Shoulders)	l.m	-	-	-
b) Median Edge	l.m	-	-	-
5. Continuity Line				
a) Continuity Line	l.m	-	-	-
6. Transition Line				
a) Transition Line	l.m	-	-	-
<i>Transverse Lines:</i>				
1. Stop Lines (Solid Lines) white, width = 450 mm	l.m	11.50	337.50	3,881.25
2. Give Way (Yield Lines)	l.m	-	-	-
3. Pedestrian Crossing Markings				
a) Zebra Crossing (Non-Signalized), width = 300mm	l.m	-	225.00	-
b) Cross Walks (Signalized), width = 300mm	l.m	82.00	225.00	18,450.00
<i>Other Lines:</i>				
1. Turn Lines (broken Lines)	l.m	-	-	-
2. Parking Bay Lines				
a) Parallel Bays, width = 100mm	l.m	-	75.00	-
b) Angle Bays	l.m	-	-	-
3. Painted Median Islands				
a) Painted Median Islands	l.m	-	-	-
4. BUS and PUJ Lane Markings				
a) BUS and PUJ Lane Markings	l.m	-	-	-
5. Channelized Junction Pavement Marking				
a) Channelized Junction Pavement Marking	l.m	-	-	-
6. Yellow Box Line, w= 150mm	l.m	178.00	112.50	20,025.00
<i>Other Markings:</i>				
1. Approach Markings to Islands and Obstructions	l.m	-	-	-
2. Chevron Markings	l.m	-	-	-
3. Curb Markings for Parking Restrictions	l.m	-	262.50	-
4. Loading/Unloading Line Zone (200mm)	l.m	-	150.00	-
<i>Messages and Symbols:</i>				
1) Messages	pcs	-	-	-
2) Symbols				
a) Give Way symbol	pcs	-	-	-
b) Pavement Arrows				
1) Through Arrow = 1.21 sq.m / each	pcs	1.00	907.50	-
2) Combined Arrow = 2.44 sq.m / each	pcs	3.00	1,830.00	-
3) Turn Arrow = 1.46 sq. m / each	pcs	2.00	1,095.00	-
c) Numerals	pcs	-	-	-
B. Signs				
1. No Loading / Unloading	pcs	4.00	3,850.00	15,400.00
2. No Parking Sign	pcs	4.00	3,850.00	15,400.00
3. Tricycle Loading / Unloading Sign	pcs	1.00	3,850.00	3,850.00
TOTAL				132,581.25
Contingencies, 5%				6,629.06
CMS, 10%				13,258.13
Miscellaneous (fees, permits, etc), 5%				6,629.06
Govt. Supervision, 2%				2,651.63
TOTAL COST				161,749.13



Navotas

Individual Information Sheets for the Traffic Bottleneck Point

NV-01 M Naval / Tangos / F Pascual / L Santos / Gov Pascual



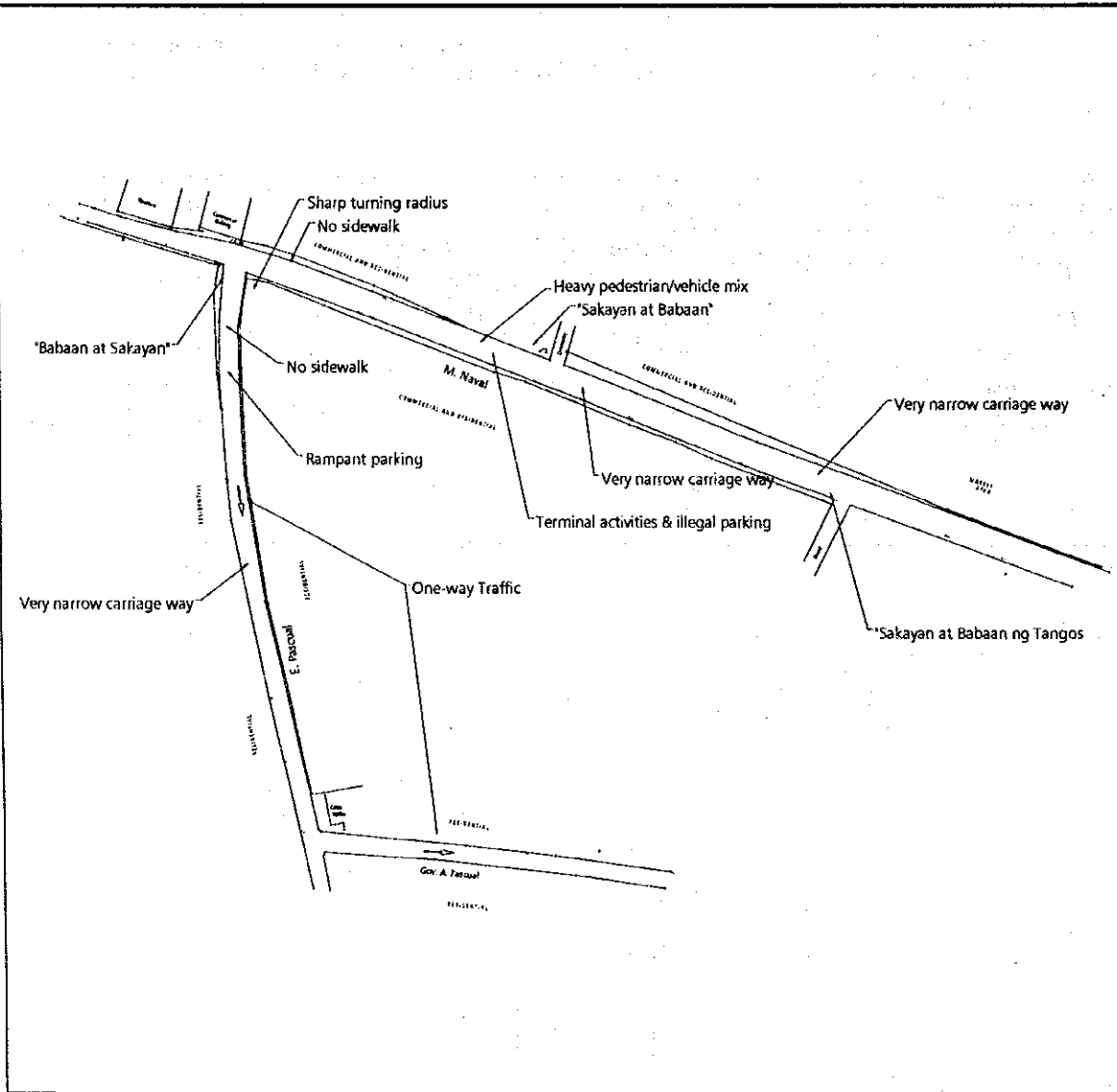
Name	M Naval / Tangos Mkt / F Pascual / L Santos / Gov A Pascual				Code	NV-01	
Sheet	Summary of Observations				LGU	Navotas	
Traffic Conditions	<ol style="list-style-type: none"> 1) M Naval is a very narrow street carrying traffic well beyond its capacity. One-way flow in place. 2) Commercial activities along the narrow corridor causes roadside friction. 3) A heavy mix of pedestrian, vehicular and pedicab/bicycle traffic; 4) Makeshift terminals and illegal parking along M Naval; 5) E. Pascual also has a very narrow carriageway, further constricted by parked vehicles; 6) No sidewalks on F. Pascual and M. Naval. 						
Physical Conditions	<ol style="list-style-type: none"> 1) The bottleneck point is characterized by a one-way street system. 2) The main road has two lanes measuring 6.23 meters in width and the intersecting roadway has a width of 4.58 meters which can accommodate only one passing vehicle as the roadsides are occupied by merchandise being sold by the abutting commercial establishments. 3) The street corners are also occupied by commercial structures leaving no room/space for proper turning movement. The area is generally crowded and the roads do not have enough space for pedestrians. 						
Signalization	None		Pavement Markings	None		Peak	17:00-18:00
Approach (M Naval / F Pascual)	Dimensions	Peak Hour Traffic Volumes (PCUs)				% Public Transport	Pedestrian Volume
		Left	Through	Right	Total		
A1: None	None	None	None	None	None	None	None
A2: M Naval (E)	6.23 m	303	174	NA	477	29.72%	Heavy
A3: F Pascual	4.58 m	NA	NA	NA	NA	NA	Light
A4: M Naval (W)	6.13m	NA	23	121	144	3.10%	Heavy
Total		303	197	121	621		
Passenger Flows						2,600	
<p>Peak Hour Volumes (PCUs) Navotas NV-01 M Naval / F Pascual</p> <p>The diagram illustrates the intersection of M Naval and F Pascual. It shows four approaches labeled A1, A2, A3, and A4. Approach A1 is 'None'. Approach A2 (M Naval East) has 174 PCUs. Approach A3 (F Pascual) has 424 PCUs. Approach A4 (M Naval West) has 144 PCUs. The total volume is 621 PCUs. The diagram also shows the distribution of traffic into Left, Through, and Right lanes for each approach.</p>							

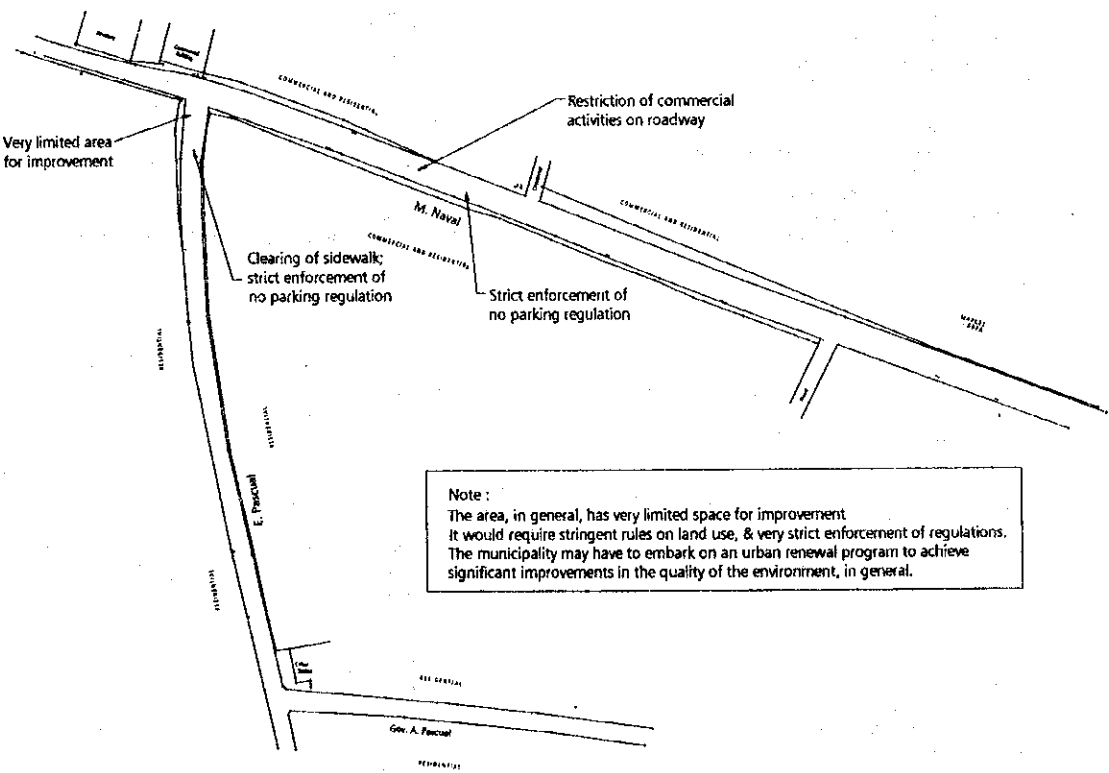
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Small Scale Traffic Improvement Measures for Metro Manila

Name	M Naval / Tangos Mkt / F Pascual / L Santos / Gov A Pascual	Code	NV-01
Sheet	Analysis	LGU	Navotas

- 1) The Navotas area is generally characterized by a network of narrow roads and limited alternative routes, a legacy of poor road planning in the past.
- 2) The dense development with very limited space for expansion leaves very little room for future improvement.
- 3) The lack of space brought about by small lot sizes forces the residents to occupy roadway space as extension for their activities, commercial or otherwise. With increase in motor vehicle ownership, even overnight parking will become a problem in the future.
- 4) The carriageway serves the purpose of a park, utility area, storage etc... thus, making it even more difficult to impose traffic regulations without the identification of alternative areas for such activities.
- 5) Road-side friction along M. Naval causes general traffic slowdown. However, an improvement here will not speed up flow because vehicles funnel into a single-lane F. Pascual.



Name	M Naval / Tangos Mkt / F Pascual / L Santos / Gov A Pascual	Code	NV-01
Sheet	Proposed Improvements	LGU	Navotas
Engineering	<ol style="list-style-type: none"> 1) No dramatic improvement possible on small-scale measures, because of the number of closely-packed stores and houses. 2) Since F. Pascual dictates overall capacity and flow on M. Naval, turning movements to F. Pascual should be improved. This may entail ROW acquisition. 		
Enforcement	<ol style="list-style-type: none"> 1) Focus on F. Pascual and ensure faster vehicle flows particularly at the corner. 2) Enforce no stopping, no loading/unloading, along F. Pascual. 3) Alternate merging of vehicles turning to F. Pascual. 		
			

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Small Scale Traffic Improvement Measures for Metro Manila

LOCATION : NV-01: M Naval / Tangos Mkt / F Pascual / L Santos / Gov A Pascual (NAVOTAS)
(cost summary)

A. Pavement Markings	Unit	Quantity	Unit Cost	Total Cost
<i>Longitudinal Lines</i>				
1. Center Lines				
a.) Broken Lines, 100 or 150 mm width, 3m length 4.50 m gaps	l.m.	-	-	-
b.) Solid White Lines, 150mm width	l.m.	-	-	-
2. Lane Lines (100 or 150mm width)				
a.) Solid Lines, w = 150mm	l.m.	-	-	-
b.) Broken Lines, w = 150mms, 200mm width	l.m.	-	-	-
3. Barrier Lines				
a.) Unbroken Double Yellow Lines (100 or 150mm width)	l.m.	-	-	-
b.) Single Yellow Line with broken White Lines (100-150mm)	l.m.	-	-	-
4. Edge Lines				
a.) Pavement Edge (Shoulders)	l.m.	-	-	-
b.) Median Edge	l.m.	-	-	-
5. Continuity Lines				
a.) Continuity Lines	l.m.	-	-	-
6. Transition Line				
a.) Transition Line	l.m.	-	-	-
<i>Transverse Lines</i>				
1. Stop Lines (Solid Lines) white, width = 450mm	l.m.	-	-	-
2. Give Way (Yield Lines)	l.m.	-	-	-
3. Pedestrian Crossing Markings				
a.) Zebra Crossing (Non-Signalized), width = 300mm	l.m.	120.00	225.00	27,000.00
b.) Cross Walks (Signalized), width = 300mm	l.m.	-	-	-
<i>Other Lines</i>				
1. Turn Lines (Broken Lines)	l.m.	-	-	-
2. Parking Bay Lines				
a.) Parallel Bays, width = 100mm	l.m.	-	-	-
b.) Angle Bays	l.m.	-	-	-
3. Painted Median Islands	l.m.	-	-	-
4. Bus and PUJ Lane Markings	l.m.	-	-	-
5. Channelized Junction Pavement Marking	l.m.	-	-	-
6. Yellow Box Line, w = 200mm	l.m.	-	-	-
<i>Other Markings</i>				
1. Approach Markings to Island and Obstructions	l.m.	-	-	-
2. Chevron Markings	l.m.	-	-	-
3. Curb Markings to Parking Restrictions	l.m.	-	-	-
4. Approach to Railroad Crossings	l.m.	-	-	-
5. Loading/Unloading Zone Lines , (w=200mm)	l.m.	145.00	150.00	21,750.00
<i>Messages and Symbols</i>				
1. Messages	pcs.	-	-	-
2. Symbols				
a.) Give Way Symbol	pcs.	-	-	-
b.) Pavement Arrows				
1.) Through Arrow = 1.21 sq.m. / each	pcs.	-	-	-
2.) Combined Arrow = 2.44 sq.m. / each	pcs.	-	-	-
3.) Turn Arrow = 1.46 sq.m. / each	pcs.	-	-	-
c.) Numerals	pcs.	-	-	-
B. Signs				
1. PUJ Loading/Unloading Sign	pcs.	-	-	-
2. No Loading/Unloading Sign	pcs.	-	-	-
3. Tricycle Loading/Unloading Sign	pcs.	-	-	-
4. No Double Parking Area	pcs.	-	-	-
C. Other Works				
1. Remove existing concrete pavement	sq.m.	-	-	-
2. New 0.20m thick concrete pavement	cu.m.	-	-	-
3. Improve Existing Subgrade	sq.m.	-	-	-
4. Restore Existing Drainage Manhole	ea	-	-	-
5. New Curb and Gutter	l.m.	-	-	-
6. Surface Preparation	sq.m.	39.67	50.00	1,983.50
TOTAL				50,733.50
Contingencies, 5%				2,536.68
CMS, 10%				5,073.35
Miscellaneous (fees, permits, etc.), 5%				2,536.68
Govt. Supervision, 2%				1,014.67
TOTAL COST				61,894.87