

NOISE STUDY AND ANALYSIS
City of Pontiac - Oakland County
East Boulevard Extension
South Boulevard to Woodward Ave

Project M-5117(002)

M. E. Scarlata

Research Laboratory Section
Testing and Research Division
Research Project 74 TI-197
Research Report No. R-918
(EV-29)

Michigan State Highway and Transportation Commission
E. V. Erickson, Chairman; Charles H. Hewitt,
Vice-Chairman, Carl V. Pellonpaa, Peter B. Fletcher
John P. Woodford, Director
Lansing, June 1974

Introduction

The city of Pontiac is located in southeastern Michigan, 25 miles northwest of Detroit, in Oakland County. This Noise Analysis was performed by the Michigan Department of State Highways and Transportation as a result of a December 21, 1973 written request from the city of Pontiac. The final EIS submitted by the city of Pontiac was returned on November 12, 1973, for clarification and additional information by the FHWA, reference letter DOT 5-00.5:

"Noise - Because the estimated future noise seemed low and because an acoustical engineering consultant was used we suspected that the approved noise estimating procedures were not used, thus our comment on the draft statement. The final statement now says on page 27 that "the method employed by the Michigan Department of State Highways" was used. Based on the simplified technique that was approved by our April 26, 1973 memorandum and the generalized assumptions we must make on the geometry, the noise levels still appear to be too low and the attenuation attributed to the 5 foot high barrier appear too high. We suggest you get a statement from the State that the summary of the noise analysis appears in order.

The final should include discussion of probable impacts on the St. Joseph Hospital on Woodward Ave. near the proposed intersection with East Boulevard."

Traffic Data

The traffic data for the present year (1974) and the design year (1995) were selected from traffic counts supplied by the city of Pontiac on March 11, 1974 (Appendix A) and the vehicle volumes in the "Final Environmental Impact Statement for East Boulevard Extension" (Fig. 1) previously submitted to the FHWA. Design speeds of 35 mph were used for all locations.

It was assumed that the design year traffic for Woodward Ave, South Blvd and the East Blvd Extension will have the same 24 hour distribution as the present distribution on Woodward Ave and South Blvd. The average hourly vehicle volumes for the highest three hours on an average day for the design year were obtained by proportioning against the present and design year ADT's as follows:

$$Q_{1995} = Q_{1974} \times \frac{ADT_{1995}}{ADT_{1974}}$$

where Q_{1974} = average of highest three hours on an average day in 1974.

The percent commercial figures were obtained by averaging over the same three hour period namely 2 to 5 p.m. Table 1 is a compilation of the traffic parameters used for the noise predictions. Five percent growth ADT was used in all the predictions.

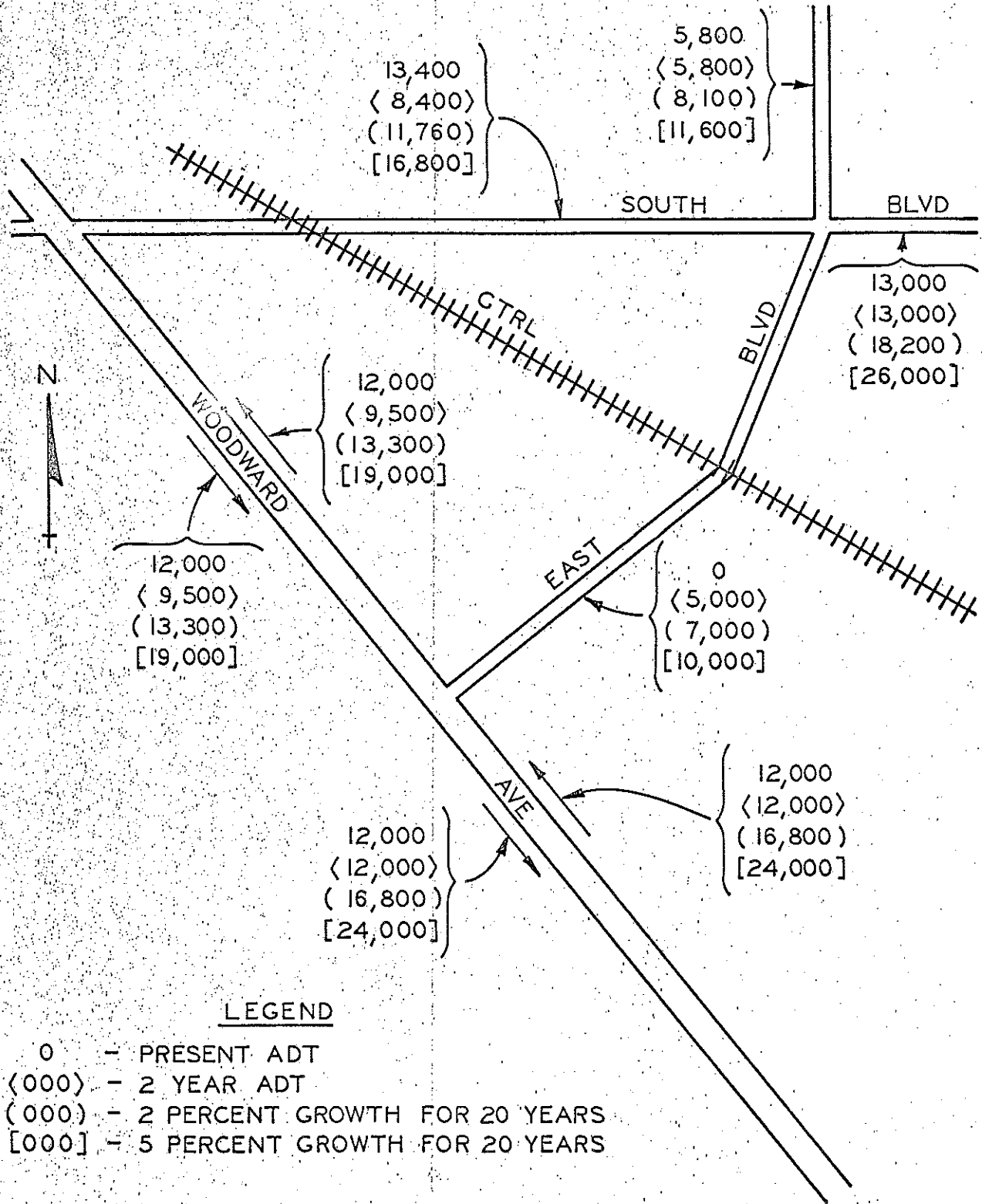


Figure 1. Traffic Volume Map

Geometric Data

The physical or geometric dimensions for the 3,000 ft long East Boulevard extension-overpass were selected from the EIS and the plan-engineering drawings.

Route Location

The proposed facility consists of three sections as follows:

1. Four lanes with a 90-ft minimum R-O-W from Woodward Ave to 400 ft southwest of the Grand Trunk Railroad Line (GTRL).
2. Four lanes, elevated and grade separation for GTRL, with a 140-ft minimum R-O-W from 400 ft southwest of GTRL to 800 ft northeast of the GTRL.
3. Four lanes with a 85 ft minimum R-O-W from 800 ft northeast of the GTRL to South Blvd.

No alternate alignments were considered.

Discussion and Conclusions

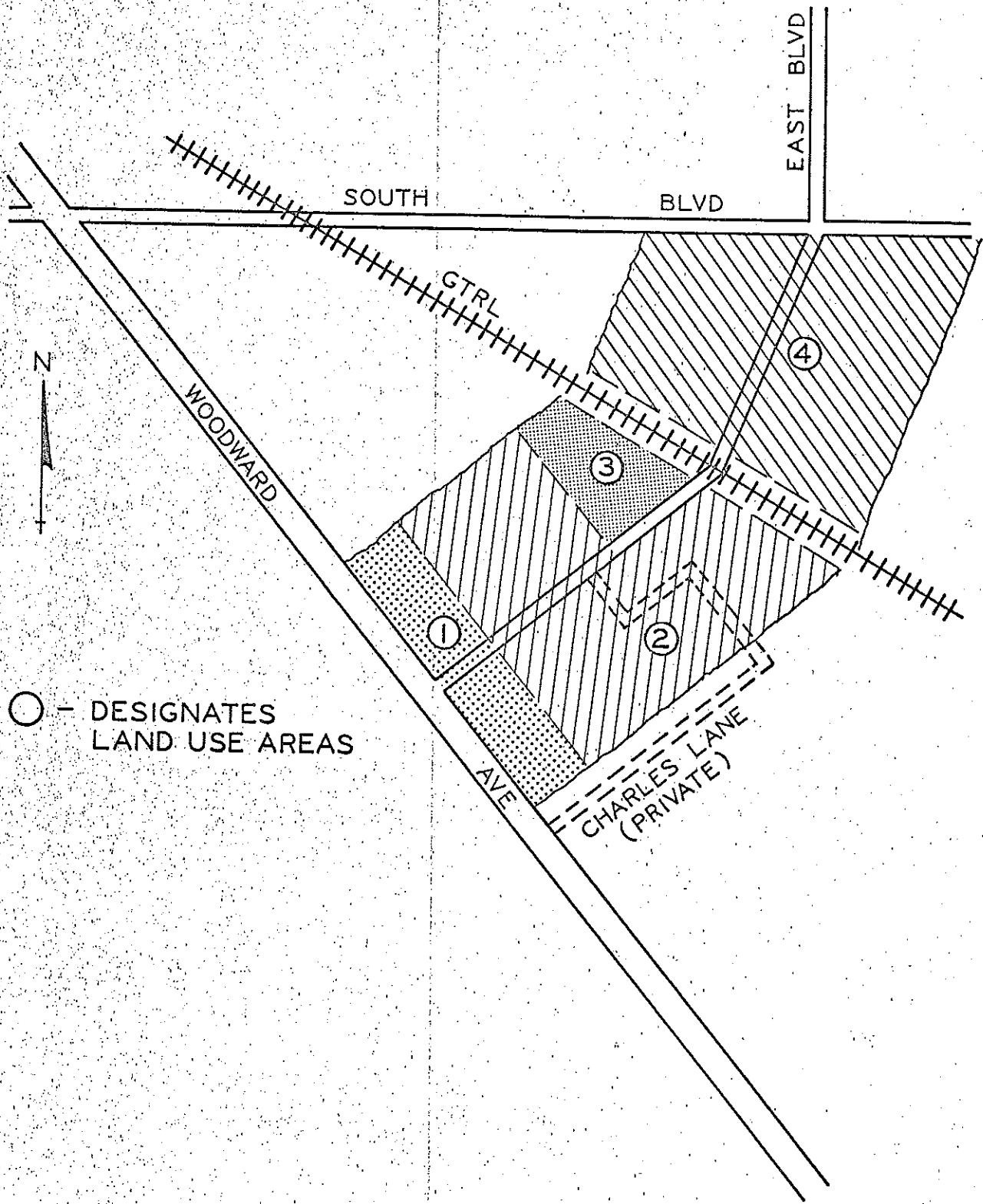
Land use categories in accordance with those of PPM 90-2 were determined for all areas along the proposed location (Fig. 2). Photographs 1 through 6 of the proposed location indicate the general appearance of the existing area.

Ambient noise levels of 48 to 52 dbA with peak levels of 64 to 70 dbA were typical of the residential areas for the April 17, 1974 measurements. Ambient noise levels of 60 to 65 dbA were typical of the industrial area on the sidewalk along South Blvd.

The L₁₀ noise levels for the design year (1995) were predicted by the method of Research Report No. R-890, "Traffic Noise Level Predictor Computer Program." Also the distances, from the center of the near lane (DN), at which the L₁₀ equals 70 dbA were calculated (Table 2).

It appears that the proposed location will be fairly noisy (mid 70's) during the design year and will be experiencing a severe impact when compared to existing conditions.

The main source of the noise in the commercial area at the intersection of East Blvd and Woodward Ave (Area 1) is due primarily to Woodward Ave. Because of many urban cross streets and driveways facing onto the route, the use of noise walls or berms is not practical for noise abatement. Consequently, it appears as though very little can be done to meet the design level and an exception to the design noise levels of PPM 90-2 must be requested.



○ - DESIGNATES LAND USE AREAS

Figure 2. East Boulevard Extension location and land use areas.

For the residential area (Area 2) the design levels may be attained by the use of a noise wall located 12 ft from the center of the near lane and extending 8 ft above pavement level with a minimum included angle of 160 degrees for any receiver.

For the undeveloped land (Area 3) the predicted design year noise level is 69 dbA, at the R-O-W line. There is no design level for this land use category, however local government units should be aware of the noise level in regard to future land use plans.

For the industrial area (Area 4) the predicted noise levels are less than the design levels, therefore nothing need be done for noise abatement.

The city of Pontiac also requested probable impact upon the St. Joseph Mercy Hospital on Woodward Ave near the proposed intersection with East Blvd. The predicted design year noise level, if the East Blvd extension is built, will be 73 dbA (DN = 156 ft). If the East Blvd extension is not built the predicted noise level will be 70 dbA. The land use category (E) which is applicable to this situation calls for 55 dbA (interior). The noise reduction due to the exterior of the structure would be 25 db, which would allow an 80 dbA level on the exterior. Since the predicted level is 73 dbA the Design Noise level of PPM 90-2 will not be exceeded.

TABLE 1
TRAFFIC DATA
(1974 and 1995 vehicle speeds 35 mph for all locations)

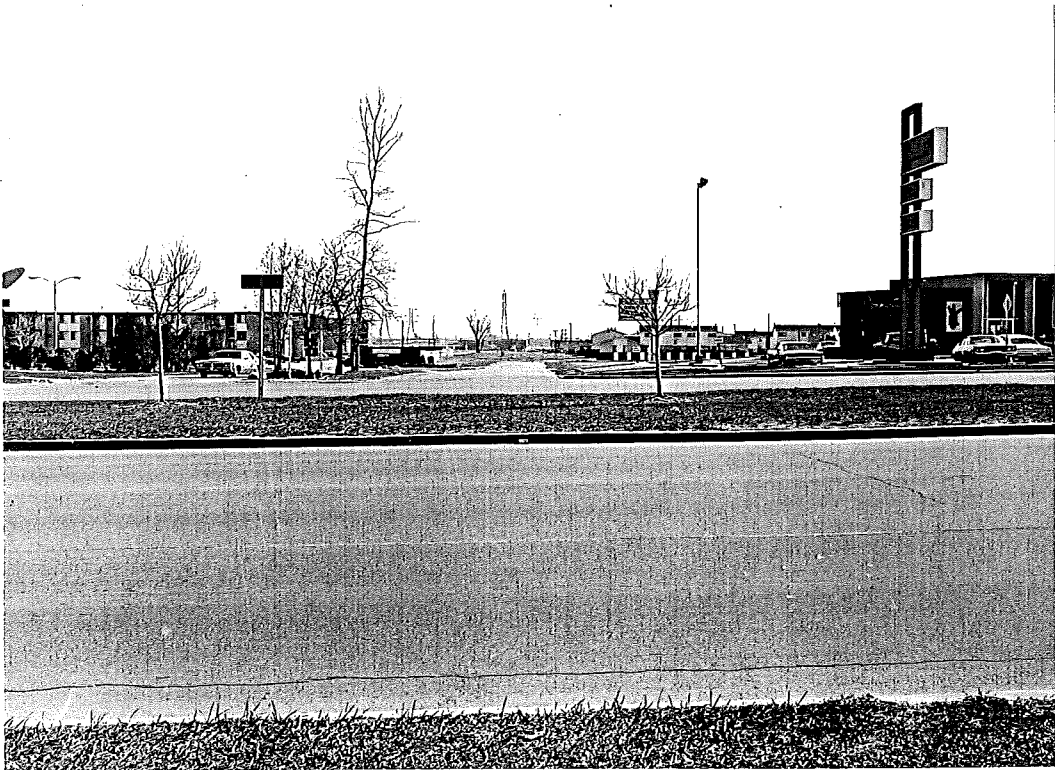
Traffic	East Boulevard	NB Woodward		SB Woodward	
		North of East Blvd	South of East Blvd	North of East Blvd	South of East Blvd
1974 Average Hourly Vehicle Volumes	---	869	869	923	923
1995 Average Hourly Vehicle Volumes	880	1,425	1,800	1,425	1,800
1974 Percent Commercial	---	3.5	3.5	2.5	2.5
1995 Percent Commercial	3.0	3.5	3.5	2.5	2.5

TABLE 2
DESIGN NOISE LEVEL IDENTIFICATION AND
COMPARISON OF PROPOSED EAST BOULEVARD
L₁₀ (dbA) Noise Levels for 1995
(Predictions from Use of R-890)

Area Number and Location	Design Level Category and Value	L ₁₀ at R-O-W	L ₁₀ 20 ft Outside R-O-W	DN for L ₁₀ = 70 dbA
1 Frontage on Woodward Ave	C(75)	83	81	--
2 200 ft NE of Woodward Ave to 100 ft NE of Charles Lane on the NW side of existing East Blvd and to the railroad on the SE side	B(70)	75	73	61
3 100 ft NE of Charles Lane to the railroad NW of existing East Blvd	D(--)	69	68	Within R-O-W
4 GTRL railway to South Blvd	C(75)	74	71	--



Photograph 1. St. Joseph Mercy Hospital, looking northwest across Woodward Ave from East Blvd R-O-W.



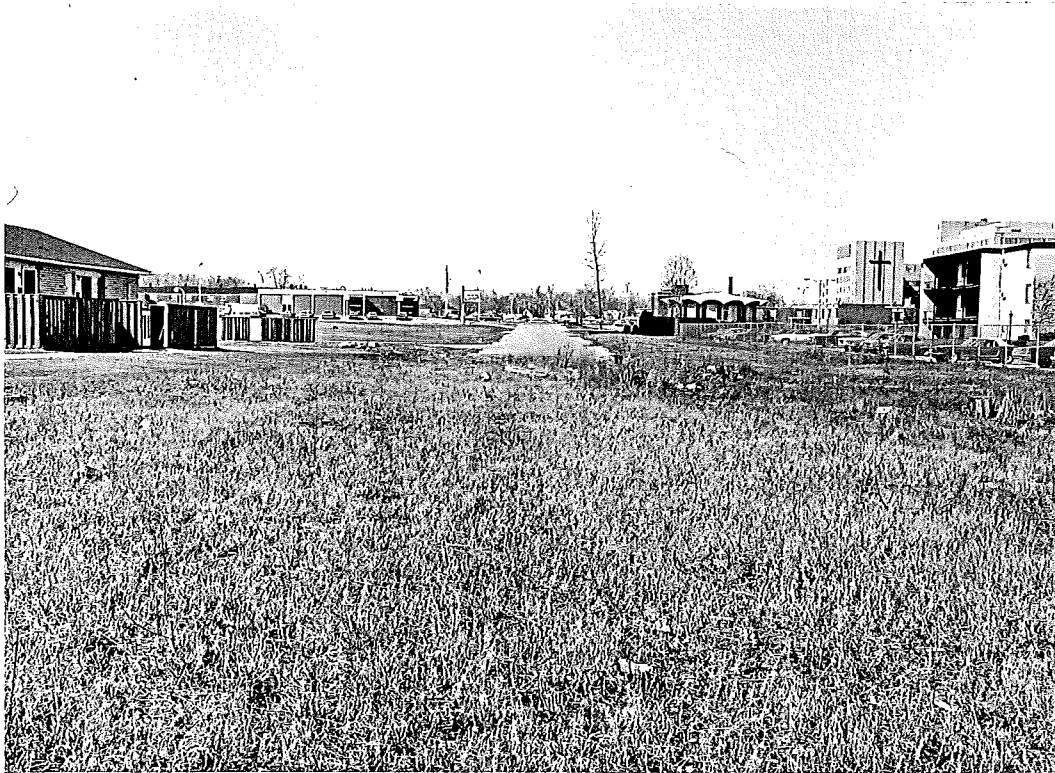
Photograph 2. Existing East Blvd, looking northeast from Woodward Ave.



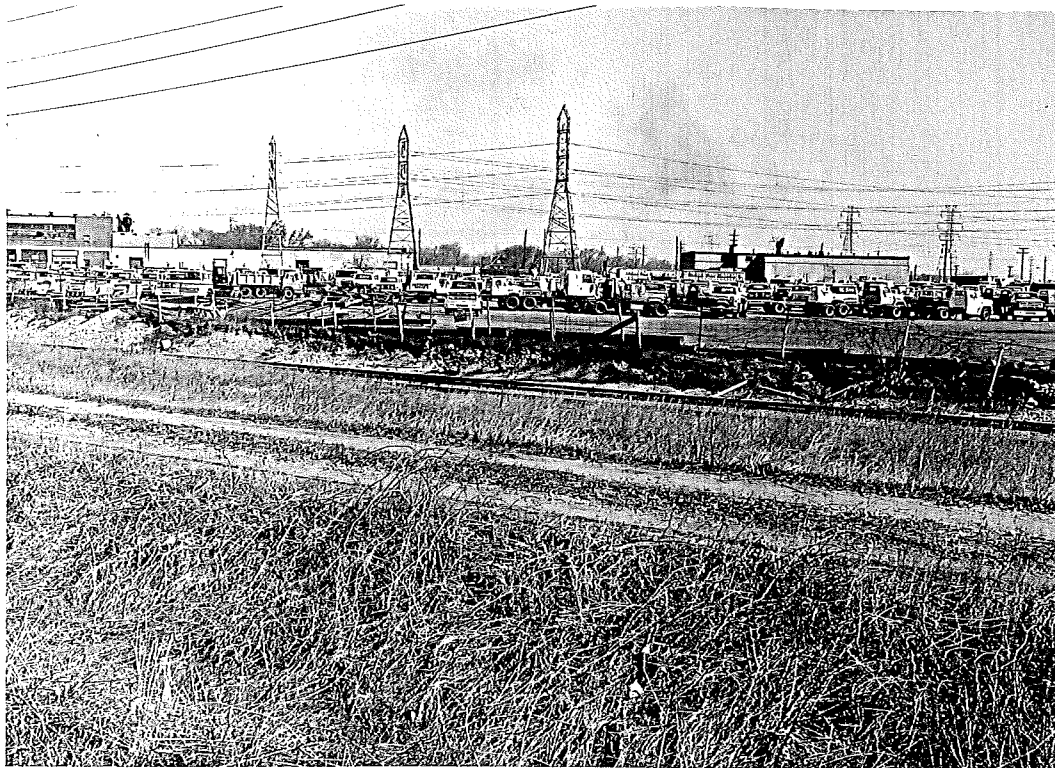
Photograph 3. Bloomfield Townhouses, looking southeast from intersection of existing East Blvd and Charles Lane.



Photograph 4. Undeveloped land behind Bloomfield Townhouses, looking northeast from intersection of existing East Blvd and Charles Lane.



Photograph 5. Site location of East Blvd extension through residential area, looking southwest from the undeveloped land behind Bloomfield Townhouses.



Photograph 6. Fleet carrier facility through which the East Blvd extension passes, looking northeast from the East Blvd R-O-W at the GTRL.

APPENDIX A
SOUTH BOULEVARD AND WOODWARD AVENUE
TRAFFIC COUNTS

PONTIAC

CITY OF PONTIAC, MICHIGAN

Department of Public Works & Service
ENGINEERING DIVISION - 55 Wessen St.
Pontiac, Michigan 48053

March 11, 1974

Mr. Gail Grove
Michigan Department of State
Highways & Transportation
735 E. Saginaw Street
Lansing, Michigan 48906

Dear Sir:

I am enclosing traffic counts for South Boulevard and Woodward Avenue in line with our telephone conversation of last Tuesday.

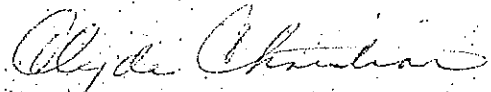
The counts you will note, were taken from 8:00 A.M. until 5:00 P.M. with commercial vehicles being counted separately. The location used for the count on South Boulevard was just westerly of the intersection of East Boulevard, while on Woodward Avenue the counts were made at the point where East Boulevard extension will intersect Woodward.

I hope that this information combined with the information which you have from other sources will permit you to draw satisfactory conclusions with regard to total commercial volumes at these locations.

If there is any additional information which we can provide you at this time, or if later you find that we can be of any assistance, please let me know.

Sincerely,

CITY OF PONTIAC - DPW & S
Engineering Division



Clyde Christian,
City Engineer

CC/vh
Encls.

FIELD DIVISION
BUREAU OF STREET TRAFFIC
TRAFFIC VOLUME COUNT

South Bound On Woodward At East Boulevard South

Day Wednesday Date March 6, 1974 Weather Clear

Checked by Frank Jones

Time	Left	Passenger		Total	Hourly Totals	Commercial		Total	Hourly Totals
		Str.	Wite						
6:15	A.M.								
6:30									
6:45									
7:00									
7:15									
7:30									
7:45									
8:00									
8:15		163				20		183	
8:30		146				15		161	
8:45		118				13		131	
9:00		148				15		163	638
9:15		108				7		115	
9:30		105				9		114	
9:45		142				8		150	
10:00		132				7		139	518
10:15		120				6		126	
10:30		139				16		155	
10:45		134				15		149	
11:00		147				14		161	591
11:15		158				8		166	
11:30		151				11		162	
11:45		164				12		176	
12:00		196				14		210	714
12:15		191				7		198	
12:30		163				12		175	
12:45		154				7		161	
1:00		159				13		172	706
1:15		165				12		177	
1:30		170				6		176	
1:45		167				7		174	
2:00		161				9		170	697
2:15		135				8		143	
2:30		183				12		195	
2:45		160				8		168	
3:00		266				13		279	785
3:15		214				9		223	*
3:30		227				11		238	
3:45		320				7		327	
4:00		273				8		281	1069
4:15		241				6		247	*
4:30		195				7		202	
4:45		227				0		227	
5:00		241				0		241	917
5:15									*
5:30									
5:45									
6:00									
Total		6288				352		6635	6635

FIELD DIVISION
BUREAU OF STREET TRAFFIC
TRAFFIC VOLUME COUNT

East Bound On South Boulevard At East Boulevard

Day Wednesday Date March 6, 1974 Weather Clear

Checked by Art Mitchell

Time	Left	Passenger		Total	Hourly Totals	Commercial		Total	Hourly Totals
		Str.	Kite						
6:15	A.M.								
6:30									
6:45									
7:00									
7:15									
7:30									
7:45									
8:00									
8:15		161				12		173	
8:30		50				13		63	
8:45		55				13		68	
9:00		61				13		74	378
9:15		45				18		63	
9:30		52				15		67	
9:45		51				14		65	
10:00		41				16		57	252
10:15		55				11		66	
10:30		49				7		56	
10:45		63				15		78	
11:00		54				20		74	274
11:15		84				26		110	
11:30		69				15		84	
11:45		70				7		77	
12:00		82				16		78	369
12:15		85				8		93	
12:30		95				9		104	
12:45		86				11		97	
1:00		91				8		99	393
1:15		88				14		102	
1:30		76				12		88	
1:45		85				10		95	
2:00		107				15		122	407
2:15		102				12		114	
2:30		100				12		112	
2:45		105				7		112	
3:00		146				6		152	490 *
3:15		151				10		161	
3:30		161				12		173	
3:45		129				5		134	
4:00		113				16		124	597 *
4:15		142				11		153	
4:30		103				9		112	
4:45		70				5		75	
5:00		79				2		81	421 *
5:15									
5:30									
5:45									
6:00									
Total		3156				426		3582	3582

FIELD DIVISION
BUREAU OF STREET TRAFFIC
TRAFFIC VOLUME COUNT

West Bound On South Boulevard At East Boulevard

Day Wednesday Date March 6, 1974 Weather Clear

Checked by Mark Sharpe

Time	Left	Passenger		Total	Hourly Totals	Commercial		Total	Hourly Totals
		Str.	Bike						
6:15	A.M.								
6:30									
6:45									
7:00									
7:15									
7:30									
7:45									
8:00									
8:15		69				6		75	
8:30		66				10		76	
8:45		41				8		49	
9:00		51				18		69	269
9:15		70				10		80	
9:30		54				13		67	
9:45		57				9		66	
10:00		56				11		67	280
10:15		43				13		56	
10:30		64				17		81	
10:45		68				13		81	
11:00		73				14		87	305
11:15		73				17		90	
11:30		67				16		83	
11:45		80				12		92	
12:00		138				19		157	422
12:15		85				14		99	
12:30		69				14		83	
12:45		76				14		90	
1:00		64				11		75	347
1:15		78				8		86	
1:30		55				15		70	
1:45		75				18		93	
2:00		81				16		97	346
2:15		66				4		70	
2:30		82				7		89	
2:45		215				16		231	
3:00		213				11		224	614
3:15		200				8		208	*
3:30		223				5		228	
3:45		258				12		270	
4:00		254				7		261	967
4:15		238				8		246	*
4:30		217				10		227	
4:45		214				3		217	
5:00		251				3		254	944
5:15									*
5:30									
5:45									
6:00									
Total		4084				510		4594	4594