

NOISE STUDY AND ANALYSIS
M 51 CITY OF NILES - BERRIEN COUNTY
MAIN STREET TO PUCKER STREET
(Control Section 11091; Job No. 01908)



MICHIGAN DEPARTMENT OF STATE HIGHWAYS

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Addendum to MDSHT
Research Report R-915R

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Research Laboratory Section
Testing and Research Division
Research Project 74 TI-210
Research Report No. R-948

Michigan State Highway Commission
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Introduction

This report is an addendum to Research Report No. R-915R, "Noise Study and Analysis, M 51 City of Niles - Berrien County, Main St to Pucker St." It results from a revision in the estimated percent of commercial vehicles during the design hourly volume (DHV). The revised data were received by the Research Laboratory in a November 5, 1974 memorandum from R. S. Kinney of the Bureau of Transportation Planning, requesting the previous noise study be updated.

Traffic Data

The traffic volumes for the design year (2000) are taken from the revised (June 5, 1974) Traffic Surveys and Analysis Report, TAR 309, with the percent commercial of DHV taken from the November 5, 1974 memorandum. Table 1 is a compilation of these data. Since vehicle speeds during the DHV were not available, peak hour speeds were used. The DHV's were assumed evenly divided for separated pavements. Figure 1 depicts the traffic section locations.

TABLE 1
M 51 PREDICTED TRAFFIC DATA
(Selected from Revised TAR 309)

Year	Traffic Parameter	Traffic Section					
		A	B	C	D	E	F
2000	DHV	2,330	1,700	1,580	1,820	1,970	1,900
2000	Percent Commercial at DHV	1.7	1.8	1.9	1.7	1.6	1.6
2000	Vehicle Speed	25	25	25	25	25	25

Geometric Data

The physical or geometric dimensions for the three-mile long section of M 51 were selected from Engineering Report 1744 and Plan-Elevation drawings.

The five route locations specified in Engineering Report 1744 share a common northern section from existing M 51 to the Penn Central Railroad, five lanes with a 150 ft minimum R-O-W. South of the Penn Central Railroad the five route locations proceed as follows:

1. 12th St facility consisting of two sections as follows:
 - a. Five lanes, with a 120-ft minimum R-O-W, from the PCRR to Sycamore St, and

- b. Divided, three-lanes per direction (six-lane facility) with a 66-ft minimum R-O-W, from Sycamore St to Main St.
2. West side of 12th St consisting of five lanes with 120 ft minimum R-O-W.
3. One way on 11th and 12th St, each having three lanes with 66-ft minimum R-O-W.
4. One way on 12th and 13th St, each having three lanes with 66-ft minimum R-O-W.
5. Both sides of 13th St, five lanes with 120-ft minimum R-O-W.

Discussion

Land use categories in accordance with Draft FHPM 7-7-3 were determined for all areas along the route locations.

Ambient noise levels of 50 to 55 dbA, typical of the entire area, were taken on April 11, 1974. Peak passby levels of 76 to 80 dbA at a distance of 40 ft from the center of the near traffic lane were typical along existing M 51.

The L_{10} noise levels were predicted for the design year (2000) for the five route locations by the method of Research Report No. R-942, "Traffic Noise Level Predictor Computer Program." Also, the distances from the center of the near lane (DN), at which the L_{10} equals 70, 72, and 74 dbA, were calculated. Table 2 is a compilation of these values.

The two houses on lots 40 and 41 at the corner of Broadway and 12th St are scheduled to be the only remaining residential properties between the three-lane divided pavements north of Main St. The predicted year 2000 L_{10} noise levels were 71 and 69 dbA at the R-O-W lines, respectively. Since these two properties will be isolated from the surrounding community, it may be desirable to purchase them.

It appears that the five route locations will be fairly noisy (73 to 76 dbA) during the design year and will constitute a considerable environmental impact (increase of about 20 db) when compared to the existing alignment.

At the present time, it is acceptable to allow up to a -5 db reduction in the automobile noise level for certain smooth bituminous surfaces, while no adjustment is allowed for trucks. The decrease in the overall noise level due to this effect is a function of the difference between the auto and truck L levels (L_{10A} and L_{10T} , respectively) and will range from about 0.3 db for $L_{10A} = L_{10T} - 10$ up to about 1.8 db for $L_{10A} = L_{10T}$. This will not be enough to meet the design noise levels.

Due to the many cross streets and driveways facing onto the proposed route locations, noise walls or berms are not practical.

The design noise levels may be attained by purchasing additional R-O-W as indicated by the DN values of Table 2. If this is not considered feasible, then it will necessitate asking for an exception to the design noise levels of Draft FHPM 7-7-3.

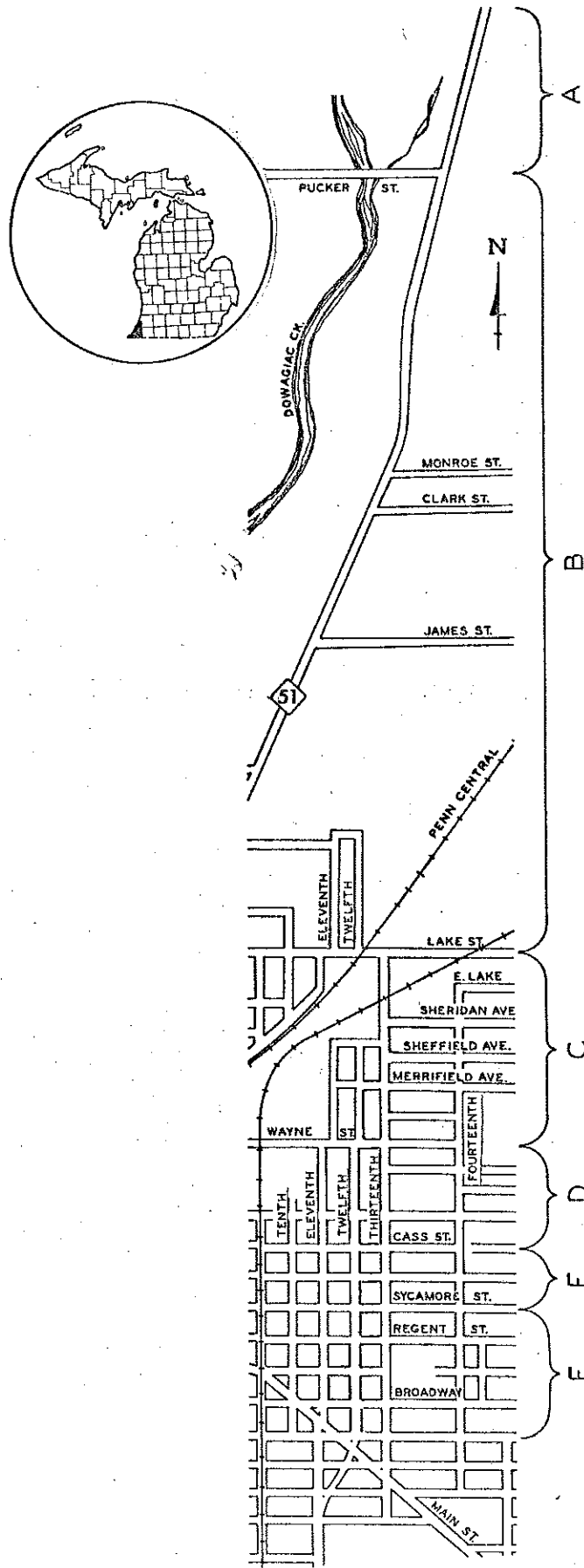


Figure 1. Traffic section locations within the proposed M 51 corridor.

TABLE 2
 DESIGN NOISE LEVEL IDENTIFICATION AND COMPARISON OF PROPOSED M 51
 L10 dbA NOISE LEVELS FOR YEAR 2000 AT R-O-W
 (Predictions From Use of R-942)

Area Number and Location	Section	FHPM 7-7-3 Design Level	Route Location No. 1				Route Location Nos. 2 and 5				Route Location Nos. 3 and 4			
			L10 dbA at R-O-W		DN, ft		L10 dbA at R-O-W		DN, ft		L10 dbA at R-O-W		DN, ft	
			74 dbA	72 dbA	70 dbA	74 dbA	72 dbA	70 dbA	74 dbA	72 dbA	70 dbA	74 dbA	72 dbA	70 dbA
1. Existing M 51 to Pucker	A	C(75)	75	62	85	114								
2. Pucker to Monroe	B	D(--)	73	--	64	89								
3. Monroe to S of Clark	B	B(70)	73	--	64	89								
4. S of Clark to N of James	B	D(--)	73	--	64	89								
5. James Area	B	B(70)	73	--	64	89								
6. S of James to Railroad	B	D(--)	73	--	64	89								
7. Railroad to East Lake	C	C(75)	73	--	62	87								
8. East Lake to Sheffield (W)	C	C(75)	73	--	62	87								
9. East Lake to Sheffield (E)	C	B(70)	73	--	62	87								
10. Sheffield to Wayne	C	B(70)	75	42	61	86	75	42	61	86	74	23	32	44
11. Wayne to Cass	D	B(70)	75	45	64	89	75	45	64	89	75	23	34	46
12. Cass to Sycamore	E	B(70)	75	45	67	92	75	45	67	92	75	24	34	48
13. Sycamore to Broadway	F	B(70)	75	23	32	46	75	44	64	89	75	23	32	46
14. Broadway to Main (W)	F	C(75)	75	23	32	46	75	44	64	89	75	23	32	46
15. Broadway to Main (E)	F	B(70)	75	23	32	46	75	44	64	89	75	23	32	46