

915R

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



MICHIGAN DEPARTMENT OF STATE HIGHWAYS

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M 51 CITY OF NILES - BERRIEN COUNTY  
MAIN ST TO PUCKER ST  
(Control Section 11091: Job No. 01908)

G. H. Grove

Research Laboratory Section  
Testing and Research Division  
Research Project 74 TI-210  
Research Report No. R-915R  
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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 Niles is located in southwestern Michigan, ten miles north of South Bend, Indiana and about 25 miles east of Lake Michigan. Situated in the southeastern corner of Berrien County, Niles lies in direct alignment with the Detroit-Chicago travel corridor. The 1970 population was 12,988 and is expected to increase to 18,000 by the year 2000. The expected year of pavement opening is 1979.

## Traffic Data

The original 1997 design year traffic data from the Traffic Surveys and Analysis Report, TAR 309 has been revised (June 5, 1974 memorandum) resulting in a design year of 2000 and new traffic volumes. 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.

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

Traffic Section	A	B	C	D	E
2000 DHV	1,700	1,580	1,820	1,970	1,900
2000 percent commercial at DHV	5.1	5.0	4.8	4.8	4.8
2000 vehicle speed	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. Typical roadway cross-sections are shown in Figure 1.

### Route Location (As defined in Engineering Report 1744)

The recommended 12th Street facility (Fig. 2) consists of three sections as follows:

- 1) Five lanes, with a 150-ft minimum ROW, from Pucker St to the Penn Central Railroad,
- 2) Five lanes, with a 120-ft minimum ROW, from the PCRR to Sycamore St, and
- 3) Divided, three-lanes per direction (6-lane facility) with a 66-ft minimum ROW, from Sycamore St to Main St.

Four alternate locations south of Sheffield St were also considered.

1) Alternate A, west side of 12th St consisting of five lanes with 120-ft minimum ROW,

2) Alternate B, one way on 11th and 12th St, each having three lanes with 66-ft minimum ROW,

3) Alternate C, one way on 12th and 13th St, each having three lanes with 66-ft minimum ROW, and

4) Alternate D, both sides of 13th St, five lanes with 120-ft minimum ROW.

### Discussion

Land use categories in accordance with those of PPM 90-2 were determined for all areas along the route location. Photographs 1 through 5 of the several locations indicate the general appearance of the existing street network.

Ambient noise levels of 50 - 55 dbA were typical of the entire area on April 11, 1974. Peak passby levels of 76 - 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 both the recommended and the four alternate locations 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  $L_{10}$  equals 70 dbA, were calculated (Table 2).

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 2000  $L_{10}$  noise levels were 79 and 76 dbA at the ROW lines, respectively. Since these two properties will be isolated from the surrounding community, it may be desirable to purchase them.

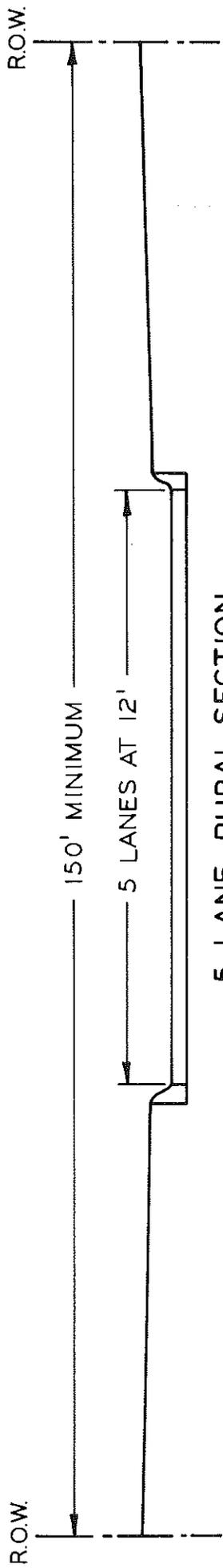
It appears that the recommended and alternate locations will be extremely noisy (79-80) during the design year and constitute a considerable impact when compared to the existing alignment.

Due to the many urban cross streets and driveways facing onto the proposed route location, noise walls or berms are not practical. The use of a bituminous capped surface will probably decrease the levels by 2 or 3 dbA but not enough to meet the design levels.

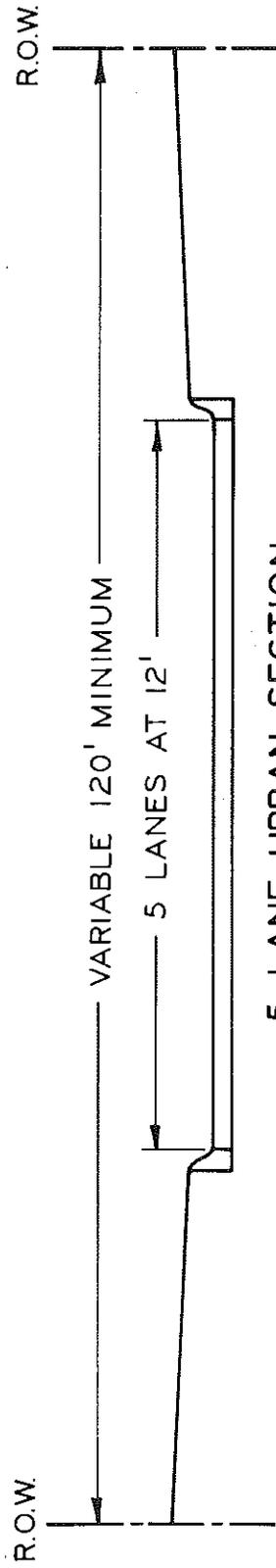
The design levels may be attained by purchasing additional ROW as indicated by the DN values of Table 2.

If this is not considered feasible, then it will necessitate asking for an exception to the design noise levels of PPM 90-2.

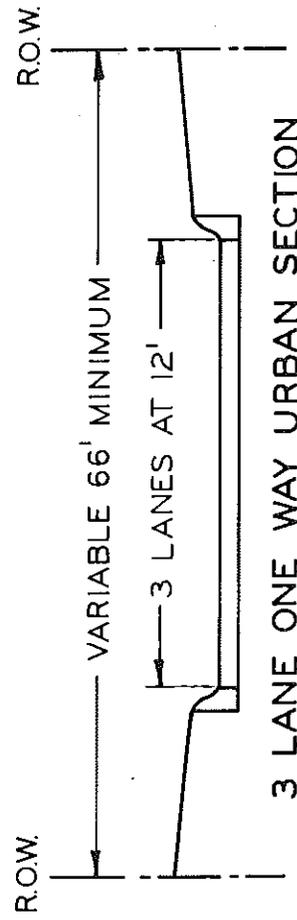
# TYPICAL CROSS SECTIONS



5 LANE RURAL SECTION



5 LANE URBAN SECTION



3 LANE ONE WAY URBAN SECTION

Figure 1. Proposed M 51 cross-sections.

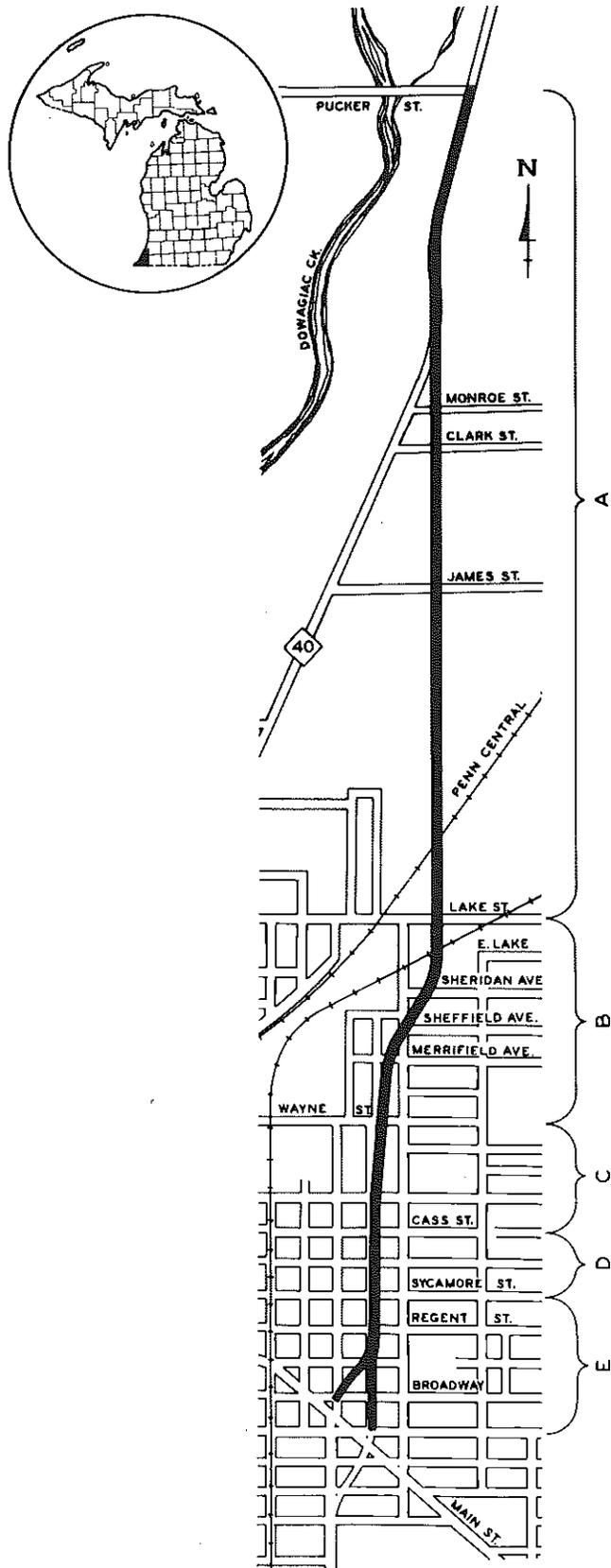


Figure 2. Recommended location of M 51 with traffic sections indicated.

TABLE 2  
 DESIGN NOISE LEVEL IDENTIFICATION AND COMPARISON OF PROPOSED M 51  
 L<sub>10</sub> (dba) NOISE LEVELS FOR 2000 AT ROW  
 (Predictions from use of R-890)

Area Number and Location	Section	PPM 90-2 Design Level	Recommended Location		Alternates A or D		Alternates B or C	
			L <sub>10</sub> (dba)	Distance to 70 dbA	L <sub>10</sub> (dba)	Distance to 70 dbA	L <sub>10</sub> (dba)	Distance to 70 dbA
1 Pucker to Monroe	A	D(--)	79	177				
2 Monroe to S of Clark	A	B(70)	79	177				
3 S of Clark to N of James	A	D(--)	79	177				
4 James Area	A	B(70)	79	177				
5 S of James to Railroad	A	D(--)	79	177				
6 Railroad to East Lake	B	C(75)	79	165				
7 East Lake to Sheffield (W)	B	C(75)	79	165				
8 East Lake to Sheffield (E)	B	B(70)	79	165				
9 Sheffield to Wayne	B	B(70)	79	165	79	165	79	122
10 Wayne to Cass	C	B(70)	79	177	79	177	80	129
11 Cass to Sycamore	D	B(70)	80	190	80	190	80	138
12 Sycamore to Broadway	E	B(70)	80	138	80	138	80	138
13 Broadway to Main (W)	E	C(75)	80	138	80	138	80	138
14 Broadway to Main (E)	E	B(70)	80	138	80	138	80	138



Photograph 1: NW quadrant of Broadway and 12th Streets; homes on Lots 40 and 41.



Photograph 2: Looking south on 12th Street, north of Broadway.



Photograph 3: Looking NW on 13th Street, south of Sheffield.



Photograph 4: Looking NE on James Street.



Photograph 5: Looking SW on M 51 at Pucker Street.