

KINLEY



AVERY

ALIGNMENT G (PARTIAL)

SHEET 1 of 3

SCALE 1" = 800'

FIGURE S - 8

D=130'

WALKER

WILLIAMS

STEEL

SILVERS

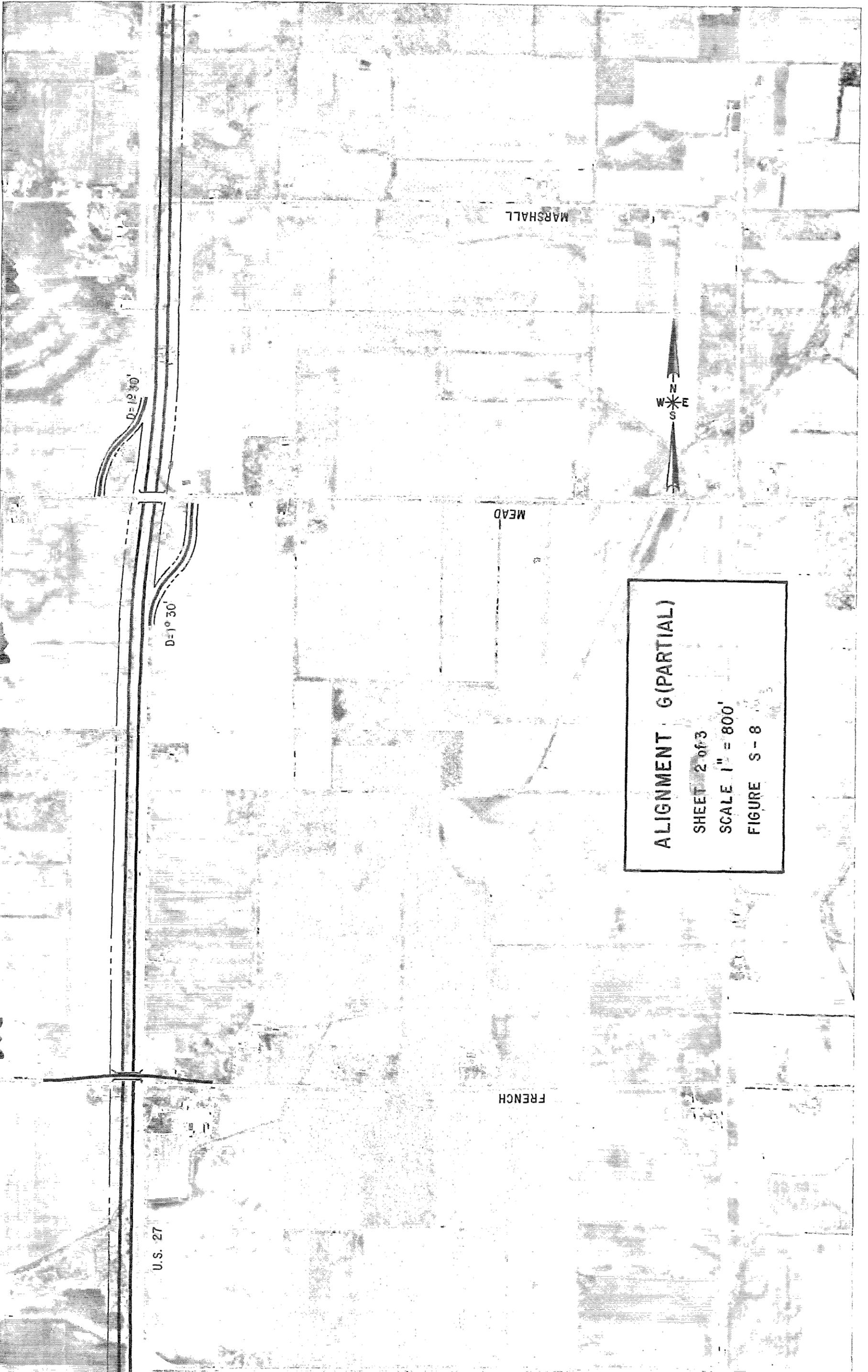
COLONY

SCOTT

KINLEY

1030





MARSHALL



MEAD

ALIGNMENT G (PARTIAL)
SHEET 2 of 3
SCALE 1" = 800'
FIGURE S - 8

FRENCH

U.S. 27

D=12° 30'

D=10° 30'

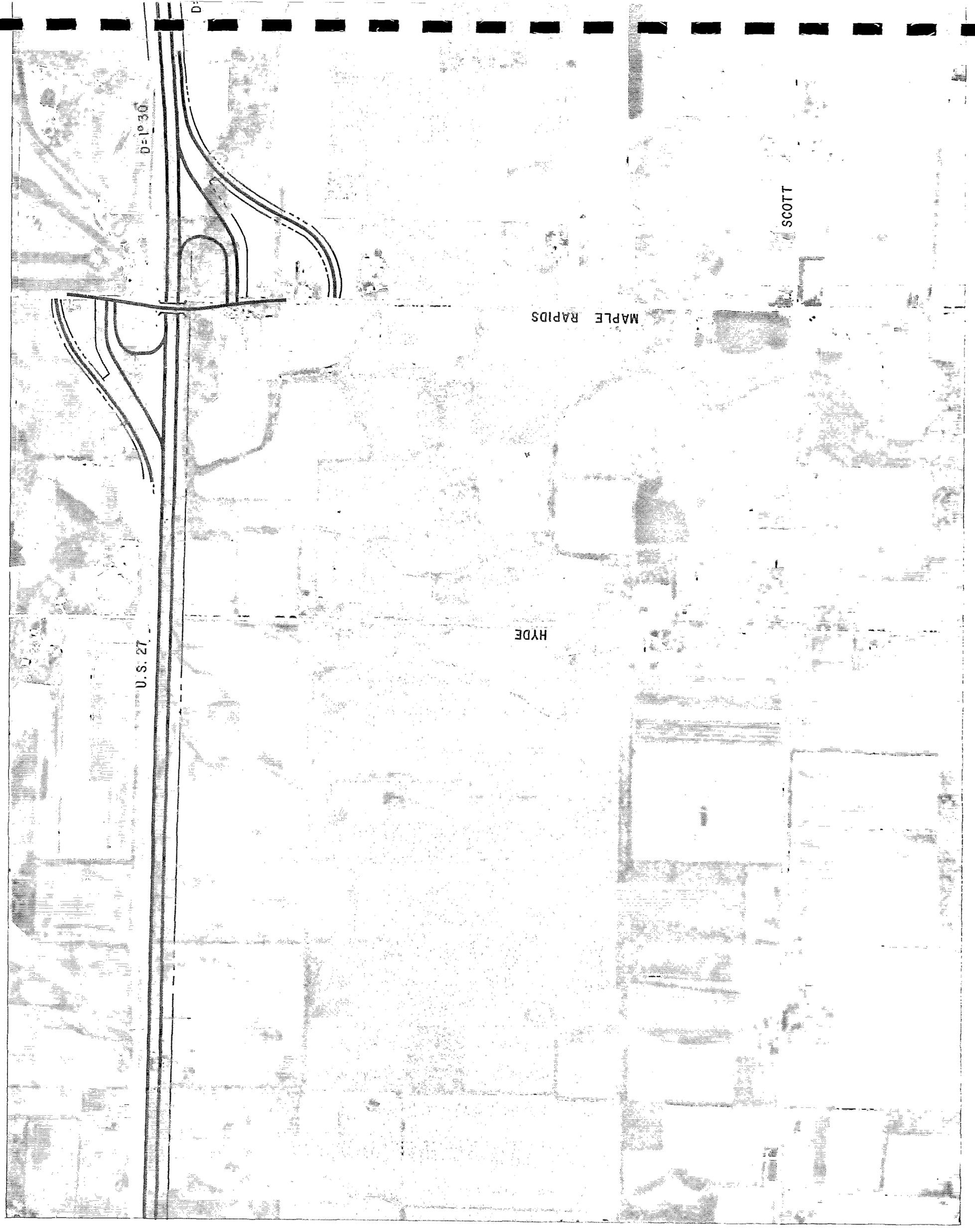
D-1030

SCOTT

MAPLE RAPIDS

HYDE

U.S. 27



WILSON



GRATIOT

ALIGNMENT G (PARTIAL)

SHEET 3 of 3

SCALE 1" = 800'

FIGURE S - 8

D=1030'

D=1030'

US-27 to an interchange with Maple Rapids Road and a crossing of the Maple River.

Alternative G (Partial) is a portion of Alternative G (North of Kinley Road to north of Pierce Road) as described in the Draft Alignment Environmental Impact Statement (dated March 9, 1977) and presented at the Public Hearing in June, 1977. The original alignment has been modified so that a comparative analysis can be presented for each of the freeway alternatives in the Supplemental Study Area. These modifications include: (a) Starting and ending points; (b) Redesigning and simplifying the Kinley Road interchange; and (c) Incorporating the relocation and design changes for the French Road area and the Maple Rapids Road area. The latter changes were included in the recommendation to the Michigan Department of State Highways and Transportation dated August, 1977.

Transportation Impacts

Traffic usage levels on Alternative G (Partial) are expected to follow the pattern of usage on both Alternative F-1 and F-3. In 1995, 24,400 trips are expected on the facility between Route M-21 and Maple Rapids Road. North of Maple Rapids Road, approximately 27,500 vehicles are expected to use the facility on the average day.

Alternative G (Partial) follows the existing alignment of US-27 from near Kinley Road to the Maple River so service for local trip ends will be provided by the frontage road incorporated into this improvement scheme. The frontage road will be continuous from Kinley Road to north of the Maple River crossing.

Traffic on the frontage road is expected to range from 2,500 to 3,000 vehicles per day in 1995 within the limits of this supplemental study.

Traveler Costs - Alternative G (Partial) is the longest of all freeway alternatives being 10.4 miles (Table S-5) as compared with 10.1 miles over Alternatives F-1 or F-3 and 9.5 miles length over Alternative F-5. Additional travel cost would result if Alternative G (Partial) were implemented--especially for the frequent traveler.

To reach Route M-21 interchange from the Maple River, motorists would travel 0.4 mile further over Alternative G (Partial) Alignment than over Alternative F-1 or F-3 Alignments. The trip would be 0.9 mile longer over Alternative G (Partial) Alignment than over Alternative F-5.

Extra costs associated with this increased travel would be either \$45 per year compared with Alternatives F-1 and F-3, or \$101 per year compared with Alternative F-5.

Safety

Accident predictions were made for traffic operations that would be expected if Alternative G (Partial) were implemented. Predictions were possible using the analysis procedure and basis described earlier in this report.

Operations on Alternative G (Partial) are expected to result in 107 (Table S-7) accidents during 1995. These include a predicted 1.8 fatalities. Concurrent traffic flows along US-27 may produce 73 accidents with 0.4 fatalities. Combined operations would then total 180 accidents and 2.2 fatalities if the analysis predictions are realized.

Of all the freeway alternatives, Alternative G (Partial) is expected to have the worst safety record. Operations with Alternative G (Partial) are expected to produce ten more accidents than Alternative F-5, the safest choice. As well, the average fatality occurrence would be 0.2 more on Alternative G (Partial).

Natural System Impact

The impact on woodlots will be minimal as the existing highway disrupted them several years ago when it was widened to four lanes. Alternative G (Partial) crosses the Hayworth Creek floodplain for approximately one mile. This area contains muck land, which ranges from one to six feet in depth.

Due to the depth and type of glacial till in the area, bedrock water sources will not be affected. Water supply access to buried deposits of outwash immediately adjacent to this alignment will not be affected.

Alignment G (Partial) traverse two possible recharge zones of the ground water systems (Figure 21). These are north of M-21 and south of the Maple River. Bedrock aquifers, principal sources of water supply in the Study Area, will not be directly affected by this alignment.

Most of the major drains crossed by Alignment G (Partial) are traversed perpendicularly. This minimized erosion and interference with the drainage patterns. This alignment runs parallel to the St. Johns Big Ditch Drain north of St. Johns for a distance of approximately one mile, and parallels another drain to the east of St. Johns, for a distance of approximately two miles.

Table S-7
 PREDICTED 1995 ACCIDENT DATA
 Alternative G (Partial)

FACILITY	HIGHWAY SECTION		LENGTH (Miles)	ADT (1)	ACCIDENT RATE (2)	ACCIDENTS PER YEAR	FATALITY RATE (3)	FATALITIES PER YEAR
	From	To						
<u>Freeway Alternative</u>								
<u>G (Partial)</u>								
	M-21	Maple Rapids Rd.	8.7	24,400	114.3	88	1.9	1.5
		Maple Rapids Rd. Maple River	1.7	27,500	114.3	19	1.9	0.3
	<u>Subtotal</u>		10.4			107		1.8
<u>Existing US-27</u>								
	M-21	Maple Rapids Rd.	7.3	3,000	767.0	61	4.3	0.3
		Maple Rapids Rd. Maple River	1.7	2,500	767.0	12	4.3	0.1
	<u>Subtotal</u>		9.0			73		0.4
	<u>TOTAL</u>					<u>180</u>		<u>2.2</u>

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- (1) Average Daily Traffic
 (2) Total Accidents per 100 million vehicle miles for 1975
 (3) Total Fatalities per 100 million vehicle miles for 1975

SOURCE: Wilbur Smith and Associates

De-icing operations will result in approximately 20 tons of additional sodium chloride being applied to the roadway surfaces. Most of the salt will eventually be deposited in the Grand River via the Maple River and the tributaries that feed the stream.

Social Impact

The displacement of agricultural land is common to each of the alignment alternatives. For evaluation purposes, this criteria has been divided into two categories, Agricultural and Prime Agricultural (Class I and II soils) Lands. An average of 300 feet has been used to compute the right-of-way (ROW) requirements.

Total land requirements for Alignment G (Partial) is approximately 388 acres. It is estimated that 80 percent (310 acres) is agricultural land. Within the agricultural acreage approximately 75 percent is classified as prime agricultural land or 232 acres. Included in the total acres is the land necessary for the interchanges at Kinley Road and Maple Rapids Road.

Several sites of interest are located adjacent to Alignment G (Partial). These include a Centennial Farm, 3 potential archeological sites, a residential structure of historic significance and another residential structure of architectural value.

Acreage required for right-of-way from the Centennial Farms will be acquired from the side or rear of the farms. The structures located on the farm will not be affected. The exact location of the archeological sites is not known. After an alignment is selected and prior to final design an archeological survey will be conducted prior to construction if requested by the State Archeologist (Appendix S-A).

Coleman's Hotel (owned by Mr. & Mrs. John Minsky) presently being used as a residential structure is listed on the State Register of Historic Sites. Preliminary design for the proposed freeway was modified to avoid the structure and the setting surrounding it.

The Salt Box House (owned by Mr. and Mrs. Bross) presently a residential structure, is a architectural value to the area. This structure could be relocated approximately 1,000 feet to the west on the same parcel of land. For a more detailed discussion of these structures please refer to pages 180 and 181 of the Draft Environmental Impact Statement dated March 9, 1977.

The G (Partial) Alignment has approximately 3 miles of roadway that crosses the section line grid at skew angles. This could result in irregularly shaped parcels of land that constrain agricultural production.

Alignment G (Partial) will have minimal impact on division of parcels of land used for farming operations. It will, however, be an inconvenience to the farmers who now farm both sides of existing US-27. They will have to use the service road system for access to the parcels they own or lease opposite the existing highway. This adverse distance could have a detrimental impact upon the operations. At the same time, the proposed freeway will eliminate the conflict between high-speed through traffic and farm equipment, which now exists.

Alignment G (Partial) passes through the St. Johns School District. This alignment, if implemented, proposes to close Steel Road, Walker Road and Hyde Road. The road closings will require minimal changes in the school bus circulation system. This alignment will displace 40 children (1%) attending classes in the St. Johns School District. It is probable that the displaced families will relocate in close proximity to their present habitat, with a net result of no change in school enrollment.

Alignment G (Partial) will not adversely affect emergency and fire protection services for the surrounding area. It is anticipated that services will be more efficient and expedient because of less conflict with traffic on US-27.

Relocation

The G (Partial) Alignment will displace approximately 29 single family structures and 4 mobile homes. In addition, this alignment will require the acquisition of 3 commercial structures and 22 farm buildings. Alignment G (Partial) will remove approximately 70 acres of residential land from the tax books of Clinton and Gratiot Counties.

Economic Impact

A direct and immediate impact of a highway is the amount of taxable land displaced. Alignment G (Partial) will reduce the amount of taxable land in Clinton County by 347 acres and Gratiot County by 31 acres. Since agricultural land accounts for 43.7 (Greenbush Township) and 70.9 (Washington Township) percent of the total tax base, this alignment will reduce the tax base in Greenbush Township by 0.6 percent and Washington Township by 0.04 percent.

School districts usually incorporate a much larger area than individual townships. Alignment G (Partial) will have an impact upon the St. Johns School District by displacing 33 residential structures, two commercial establishments and 388 acres of land.

Impact upon the county tax base is even less significant. Potential

development particularly in the vicinity of the interchange locations could have a positive impact on the tax base of the area.

The transportation facility will offer the user improved access to the visual aesthetics of the area's landscape. At the same time, the intrusion of a highway facility on the landscape will alter the visual quality available to the residents.

Air and Noise Impact

Air - There is no significant impact on air quality from the G (Partial) Alignment. Carbon monoxide comprises the majority of automobile pollutants in a rural area. This alignment will generate a total one-hour peak concentration of carbon monoxide of 1.0 PPM (1995) or 2 percent of the National Ambient Air Quality Standard (NAAQS) of 35 PPM. The eight hour prediction is 0.2 PPM or 2 percent of the NAAQS (9PPM).

For this analysis, the California Line Source Model (CALINE - 2) was used. Inputs into the model include: Critical wind speed of 3 MPH; Atmospheric Stability Class (PASQUILL) of F; An average speed of 55 MPH for vehicles; Wind direction of 15 degree with the highway; And a vehicle mix of 90% gasoline cars, 2% light duty gasoline, 4% each of heavy duty gasoline trucks and heavy duty diesel trucks.

In summary, based on the above analysis the G (Partial) Alignment will not significantly affect the air quality within the area. It is our findings that the project is consistent with the State Implementation Plan for Air Quality.

Noise - The pattern of noise contours will not change significantly as the alignment follows the existing roadway alignment. The 70 dBA and above contour will extend 320 feet either side of the center of median. The residential structures located within this area will be acquired for right-of-way. The 60 to 70 dBA contour will extend approximately 850 feet either side of center of median. There are 30 residences that could experience a noise level between 60 decibels and 70 decibels.

COST ESTIMATES

Capital cost estimates were prepared for each of the alternative freeway improvements (Table S-8). Estimates were derived from unit costs furnished by the Michigan Department of State Highways and Transportation. Unit costs were based upon actual current costs on projects similar to the proposals of this Study.

Table S-8
 COST ESTIMATES
 FOR
 ALTERNATIVE IMPROVEMENTS

<u>ALTERNATIVE</u>	<u>LENGTH</u>	<u>COST (000's)</u>		
		<u>Engineering and Construction</u>	<u>Right-of -Way</u>	<u>Total</u>
F-1	10.0	\$ 21,603	\$ 1,343	\$ 22,946
F-3	10.0	24,524	1,141	25,665
F-5	9.5	21,794	815	22,609
G (Partial)	10.4	25,926	2,040	27,966

SOURCE: Michigan Department of State Highways and Transportation
 Wilbur Smith and Associates.

Alternative F-1

This particular alignment involves two situations where slightly unusual costs are anticipated. The first of these is the occurrence of muck deposits along the alignment between Kinley Road and Silvers Road. Subsurface investigations of these deposits were conducted in December, 1977, through soundings by the Michigan Department of State Highways and Transportation and a preliminary analysis was made of the probable depth of unstable soils. Preliminary analysis revealed depths of 5-feet as suitable for cost estimates for removal and replacement of these materials. Since the deposits are relatively shallow, major additional costs are not anticipated.

The second situation that will add to the costs is the extent of potential conflict between construction operations and traffic operations on US-27. Of necessity, traffic operations, on US-27 must be maintained during construction which must include special features to accomplish this. These special features, such as flagmen at equipment crossings, are routinely applied throughout the state in these situations so exceptionally high extra costs are not anticipated. However, it should be noted that potential conflicts do exist between Marshall Road and the Maple River, a distance of approximately 3.5 miles.

These and other usual engineering and construction costs were estimated at \$21.6 million for the 10.0 mile section. Right-of-way requirements for both lands and structures were estimated at \$1.3 million after preparing preliminary appraisals of values and relocation costs. Together, these combine for a total estimated costs of \$22.9 million.

Alternative F-3

Construction of the freeway along this alignment will entail muck removal operations similar to those required for Alternative F-1. The F-3 Alignment crosses the deposits one-quarter mile west of Williams Road between Avery Road and Silvers Road. Two separate deposits were discovered but the crossing length and depth are similar to the F-1 situation.

Additional costs for traffic maintenance along US-27 will be somewhat less than for Alternative F-1 since the construction distance along US-27 is approximately 0.7 mile shorter on Alternative F-3.

Engineering and construction costs were estimated at \$24.5 million for the 10.0 mile section. From preliminary appraisals, right-of-way costs were estimated as \$1.2 million. Total costs are estimated to be \$25.6 million.

Alternative F-5

Alternative F-5 Alignment follows the path of F-3 Alignment crossing the muck deposits west of Williams Road, so extra costs due to the muck would be the same as F-3 and similar to those for F-1 Alignment.

Maintenance of traffic costs along US-27 would be less than for either of the other two alternatives since F-5 Alignment follows US-27 alignment for a shorter distance of approximately 0.5 mile.

Construction and engineering costs were estimated at \$21.8 million for the 9.5 mile improvement. Right-of-way costs were estimated as \$0.8 million. Total costs are expected to be \$22.6 million.

Alternative G (Partial)

Soundings through muck deposits along present US-27 between Colony Road and Silvers Road were not conducted for this Study since it was possible to reach preliminary conclusions from experience during the duplication project on US-27.

Traffic maintenance along US-27 will contribute significantly to the construction cost since US-27 alignment would be utilized for approximately 6.5 miles distance.

Engineering and construction costs are expected to be \$25.9 million. Right-of-way costs were estimated at \$2.0 million. Total costs of \$27.9 million are anticipated.

SUMMARY OF IMPACTS

SUMMARY

The detailed analysis of each alternative as presented in the Supplement to the Draft Alignment Environmental Impact Statement indicates several criteria, which could be used as the basis for developing an improvement for US-27 within the Study Area. The more salient factors are summarized in this section and in Table S-9.

Alignment F-1 - begins north of the M-21 interchange and continues in a northerly direction east of Williams Road to Walker Road, then turns west between Walker and Kinley Roads to approximately one-half mile east of US-27, then takes a northerly direction between US-27 and Scott Road, joining existing US-27 in the vicinity of the Maple Rapids Road interchange, then continuing northward to the Maple River. It is estimated that 14 percent of the total right-of-way (ROW) acreage is presently used for residential purposes, one percent for commercial uses and 85 percent for agricultural uses and/or vacant land.

Alignment F-1 has approximately 3 miles of roadway traversing the landscape on a diagonal. Six farming operations greater than 100 acres but less than 300 acres and one greater than 300 acres will be divided into two parcels. The degree of impact from severance depends upon the amount of land acquired and size and type of farming operations (i.e. cash crop, dairy, feedlot, etc.). The impact could be significant on the smaller operations, but at the same time inflicting adverse impact on the larger operations due to the volume of equipment and land required for a profitable operation.

With Alignment F-1, 78 percent of the agricultural and vacant land has an expected yield of 105 bushels of corn per acre, 13 percent with 110 bushels per acre, and 9 percent with 120 bushels per acre. Alignment F-1, F-3 and G (Partial) utilize about the same percentage of the better producing soils, whereas Alignment F-5 utilizes more of the lesser producing soils.

Alignment F-1 will require the relocation of approximately 25 residential structures, one commercial structure and 21 farm buildings. This compares favorable with Alignment F-3 but 24 percent greater than Alignment F-5 and 17 percent less than Alignment G (Partial).

Acreage for ROW will be required from two woodlots. In addition approximately 40 acres of floodplains will be required for this alignment.

Table S-9
SUMMARY OF QUANTIFIABLE IMPACTS AND COST ESTIMATES
Supplemental Study Area

	F-1	F-3	F-5	G (Partial)
Length (Miles)	10.0	10.0	9.5	10.4
Miles on Diagonal	3.0	3.5	4.5	3.0
<u>Land Use Changes (Total) (1)</u>	469	430	425	388
Residential	68	45	35	70
Commercial	2	2	0	8
Agricultural and Vacant	399	383	390	310
<u>Major Soil Groupings (Acres) (2)</u>	399	383	390	310
Group 2 105 bushels-corn per acre	316	287	202	253
Group 3 120 bushels-corn per acre	31	31	35	31
Group 5 65 bushels-corn per acre	0	14	104	0
Group 8 110 bushels-corn per acre	52	51	49	26
<u>Relocations (Total)</u>	47	45	36	57
Residential	25	23	18	33
Rural-Non Farm	16	12	8	18
Rural-Farm	9	11	10	15
Commercial	1	1	0	2
Public Quasi-Public	0	0	0	0
Farm Building	21	21	18	22
<u>Natural Systems</u>				
Woodlots (Number)	2	6	5	0
Floodplain (Acres)	40	54	54	24
<u>Noise Impacts (3)</u>				
60 to 70 dBA contour	27	21	15	30
<u>Estimated Tax Loss (4)</u>				
Clinton County	\$ 2,900	\$ 2,564	\$ 1,618	\$ 5,052
St. Johns School District	18,800	17,067	12,195	30,488
Bingham Township	157	61	61	210
Greenbush Township	343	381	218	681
Washington Township	129	129	129	129
<u>Estimated Cost (Total) (5)</u>	\$ 22.9	\$ 25.6	\$ 22.6	\$ 27.9
Construction and Engineering	21.6	24.5	21.8	25.9
Right-of-Way	1.3	1.1	0.8	2.0

- Note: (1) Acres to be converted to transportation.
(2) Major Soil Groupings and Acreage Yield established by Soil Conservation Service and Co-Operative Extension Service. The first soil represents 60%, the second soil represents 30% and the third soil represents 10% of the soils in the groupings.
a. Group 2 -- Capac-Parkhill-Marlett
b. Group 3 -- Blount-Sims-Morley
c. Group 5 -- Boyer-Wasepi-Spinks
d. Group 8 -- Houghton-Gelford-Adrian
(3) Number of Structures within the 60dBA to 70dBA contour range.
(4) Estimated tax loss based on 1976 milage rates
(5) Cost estimates Millions of Dollars.

SOURCE: Wilbur Smith and Associates

Approximately 27 residential structures will be within the 60 to 70 dBA noise contour range. This is 22 percent and 44 percent greater than Alignment F-3 and F-5 respectively, but 10 percent less than Alignment G (Partial).

1995 Facilities - There are differences among the alternatives with regard to the number of traffic lanes that will be available in the future years for service to north-to-south travel demand. Certain alternatives require that segments of US-27 be reduced from the present four-lanes to only two-lanes. This results in dis-benefits that should be noted.

In the case of Alternative F-1, a 3.5 mile segment of US-27 would be reduced from its present four-lane width to only two-lanes. Throughout the segment it will be necessary to remove two lanes of the present pavement in order to construct the four lanes of the new freeway with a safe marginal width between the freeway lanes and the remaining pavement on US-27. The present lanes on US-27 are separated by a narrow median that is an unacceptable margin width between freeway lanes and local service lanes. Acceptable traffic service is anticipated even though two lanes of US-27 would be retired.

Acceptable service is anticipated since future travel demand (1995) can be served by two freeway lanes in each direction and single two-lane frontage road for local travelers. However, local service will not be as good as it would be if four lanes were provided. A lower density of vehicles would be the case. It is rational to expect safer operations with four lanes but statistical studies have not substantiated this in similar situations elsewhere.

Accordingly, dis-benefits from Alternative F-1 implementation are recognizable over the 3.5 mile segment of US-27 where two of the present four lanes would be removed. Dis-benefits to local travel service are expected and it is rational to assume, less potential for extremely safe operations.

The estimated tax loss from this alignment is 9 percent greater than Alignment F-3 and 35 percent greater than F-5, but 46 percent less than Alignment G (Partial).

Estimated cost for this alignment is \$22.9 million. Right-of-way accounts for approximately 5 percent of the total cost. The total cost compares favorably with Alignment F-5 but approximately 11 percent and 21 percent less than Alignments F-3 and G (Partial) respectively.

Alignment F-3 - begins north of the M-21 interchange and continues in a northerly direction, east of Williams Road, to north of Walker Road, crossing to the west side of Williams Road and continuing in a northerly direction to north of Marshall Road and Hyde Road, joining existing US-27 in the vicinity of the Maple Rapids Road interchange, then continuing northward to the Maple River. It is estimated that 10 percent of the total ROW acreage is used for residential purposes, one percent for commercial uses and 89 percent for agricultural uses and/or vacant land.

Alignment F-3 has approximately 3.5 miles of roadway traversing the landscape on a diagonal. Three farming operations greater than 100 acres but less than 300 acres and one greater than 300 acres will be divided into two parcels. The degree of impact from severance depends upon the amount of land acquired and the size and type of operations (i.e. cash crop, dairy, feedlot, etc.). The impact could be significant on the smaller operations, but at the same time inflicting an adverse impact on the larger operations due to the volume of equipment and land required for a profitable operation.

With Alignment F-3, 74 percent of the agricultural and vacant land has an expected yield of 105 bushels of corn per acre, 13 percent with 110 bushels per acre, 8 percent with 120 bushels per acre and 5 percent with 65 bushels per acre. Alignment F-1, F-3 and G (Partial) utilize about the same percentage of the better soils with Alignment F-5 utilizing a greater quantity of the lesser producing soils.

Alignment F-3 will require the relocation of approximately 23 residential structures, one commercial structure, and 21 farm buildings. This compares favorable with Alignment F-1, but 20 percent greater than Alignment F-5 and 21 percent less than Alignment G (Partial).

Acreage for ROW will be required from 6 woodlots. In addition 54 acres of floodplain will be required for this alignment.

Approximately 21 residential structures will be within the 60 to 70 dBA noise contour range. This is 28 percent less than Alignment F-1, 42 percent less than G (Partial) and 28 percent greater than Alignment F-5.

1995 Facilities - In 1995, if Alternative F-3 is implemented, a 2.8 mile segment of US-27 would be reduced from four lanes to two lanes. This is due to Alternative F-3 Alignment

following US-27 for that distance where one of the existing roadways must be removed to accommodate the new freeway.

Dis-benefits will occur over this distance since traffic service will be lower when two lanes are retired. As well, it is rational to expect a decrease in the potential for safety that would be possible from four-lane operations with a low density of vehicles in the traffic stream.

The estimated tax loss from this alignment is 9 percent and 52 percent less than Alignment F-1 and G (Partial) respectively but 29 percent greater than Alignment F-5.

Estimated cost for this alignment is \$25.6 million. This is approximately 11 percent greater than Alignments F-1 and F-5 but 8 percent less than Alignment G (Partial). ROW cost accounts for 4 percent of the total cost. This compares favorably with Alignments F-1 and F-5 but less than Alignment G (Partial).

Alignment F-5 - follows the same alignment as Alignment F-3 except that F-5 continues northward rather than turning west north of Marshall Road. From Marshall Road, Alignment F-5 continues north along the line west of Williams Road to Hyde Road then takes a north-westerly direction joining existing US-27 north of Gratiot Road then continuing to the Maple River. It is estimated that 8 percent of the total ROW acreage is used for residential purposes and 92 percent for agricultural uses and/or vacant land.

Alignment F-5 has approximately 4.5 miles of roadway traversing the land scape on a diagonal. Four farming operations greater than 100 acres but less than 300 acres and one greater than 300 acres will be divided into two parcels. The degree of impact from severance depends upon the amount of land acquired and the size and type of operation (i.e. cash crop, dairy farm, feedlots, etc.). The impact could be significant on the smaller operations, while at the same time inflicting an adverse impact on the larger operations due to the volume of equipment and land required for a profitable operation.

Within Alignment F-5, 26 percent of the agricultural and vacant land has an expected yield of 65 bushels of corn per acre, 51 percent with 105 bushels per acre, 12 percent with 110 bushels per acre and 11 percent with 120 bushels per acre. This alignment utilizes a greater percentage of the lower yield land than Alignments F-1, F-3 and G (Partial).

Alignment F-5 will require the relocation of approximately 18 residential structures and 18 farm buildings. This is approximately 23 percent, 20 percent and 36 percent less than Alignment F-1, F-3 and G (Partial) respectively.

Acreage for ROW will be required from 5 woodlots. In addition 54 acres of floodplain will be required for this alignment.

Approximately 15 residential structures will be within the 60 to 70 dBA noise contour range. This is 44 percent, 28 percent and 50 percent less than Alignment F-1, F-3 and G (Partial) respectively.

1995 Facilities - Alternative F-5 is unique among the alternatives since all of US-27 will remain as four lanes because the Alignment of F-5 does not follow US-27.

Dis-benefits from reduction of US-27 from four lanes to two lanes will not occur from implementation of Alternative F-5.

The estimated tax loss from this alignment is 35 percent, 29 percent and 66 percent less than Alignments F-1, F-3 and G (Partial) respectively.

Estimated cost for this alignment is \$22.6 million. This is approximately 11 percent less than Alignment F-3 and approximately equal to Alignment F-1 and 26 percent less than Alignment G (Partial). ROW costs account for 3 percent of the total costs. This compares favorably with Alignments F-1 and F-3, but less than Alignment G (Partial).

Alignment G (Partial) - follows the same alignment as Alignment F-1 except that G (Partial) continues westward rather than turning north interchanging with existing US-27 at the Kinley Road interchange. From this point, the G (Partial) Alignment continues to follow the present US-27 alignment to the Maple River. It is estimated that 18 percent of the total ROW acreage is presently used for residential purposes, 3 percent for commercial uses and 79 percent for agricultural uses and/or vacant land.

Alignment G (Partial) has approximately 3 miles of roadway traversing the landscape on a diagonal. This alignment will divide a farming operation of more than 300 acres into two parcels. In addition, this alignment will be an inconvenience to the farmers who now farm both sides of existing US-27. The adverse distance could have a detrimental affect upon their operations. However, at the same time, the existing conflict between farm vehicles and through traffic will be

eliminated resulting in a savings of time and energy for the farmer as well as the other travelers.

Within Alignment G (Partial) 81 percent of the agricultural and vacant land has an expected yield of 105 bushels of corn per acre, 9 percent with 110 bushels per acre and 10 percent with 120 bushels per acre. This alignment compares favorable with Alignment F-1 and F-3, but Alignment F-5 utilizes a greater amount of less productive land.

Alignment G (Partial) will require the relocation of approximately 33 residential structures and 22 farm buildings. This is approximately 17 percent, 21 percent and 36 percent greater than Alignments F-1, F-3 and F-5 respectively.

Woodlots in the area of this alignment have had both the timber and wildlife resources diminished through the affect of the existing highway. This alignment will not have an impact on additional woodlots. Approximately 24 acres of floodplain will be required for this alignment.

Approximately 30 structures will be within the 60 to 70 dBA noise contour range. This is 10 percent, 30 percent and 50 percent greater than Alignments F-1, F-3 and F-5 respectively.

1995 Facilities - Of all the alternatives, Alternative G (Partial) utilizes US-27 alignment to the greatest extent. It follows US-27 alignment for a distance of 6.5 miles where it will be necessary to reduce the existing four lanes to two lanes in order to provide a safe marginal width between freeway lanes and local service lanes.

Dis-benefits will be the greatest for Alternative G (Partial) since traffic service will be less on US-27 than for any other alternative. It is also rational to expect the potential for safe operations will decrease since the density of vehicles will be greater after the two-lane retirement. However, safety statistics have not thus far supported this conclusion in similar situations elsewhere.

The estimated tax loss from this alignment is 46 percent, 52 percent, and 66 percent greater than Alignments F-1, F-3 and F-5 respectively.

Estimated cost for this alignment is \$27.9 million. This is approximately 21 percent and 23 percent greater than Alignments F-1, F-3 and F-5. ROW cost account for 8 percent of the total. The ROW cost is approximately 35 percent, 45 percent and 60 percent greater than Alignments F-1, F-5 and F-3 respectively.

Conclusion - No attempt has been made to select one alignment over the other. Criteria discussed in the above analysis offer trade-offs (i.e. farm land VS relocation VS tax loss VS costs, etc.) that should be carefully evaluated and studied. As no one factor makes one alignment more attractive than the other, it is anticipated that comments received from local, state and federal agencies, local citizens and special interest groups, will greatly assist in determining the preferred alignment in the Supplemental Study Area.

APPENDIX S-A

LETTER FROM
STATE HISTORIC PRESERVATION OFFICER

MICHIGAN DEPARTMENT OF STATE
RICHARD H. AUSTIN SECRETARY OF STATE



LANSING
MICHIGAN 48918

MICHIGAN HISTORY DIVISION
ADMINISTRATION, ARCHIVES,
HISTORIC SITES, AND PUBLICATIONS
3423 N. Logan Street
517-373-0510
STATE MUSEUM
505 N. Washington Avenue
517-373-0515

April 6, 1978

Mr. G. Robert Adams
Environmental and Community
Factors Division
Michigan Department of State
Highways and Transportation
Lansing, Michigan 48909

Dear Mr. Adams:

We have checked our records and have determined that no archaeological sites known to us at this time will be affected by any of the potential alternative routings of US-27 north of St. Johns.

Sincerely,

A handwritten signature in cursive script that reads "Martha M. Bigelow".

Martha M. Bigelow
State Historic Preservation Officer
Michigan History Division

MMB:mr