



Intersection Study

HIG-50-2.18 USR 50 AND SR134

General Engineering Services Contract
PID No. 19194

Prepared for: ODOT District 9

January 19, 2001





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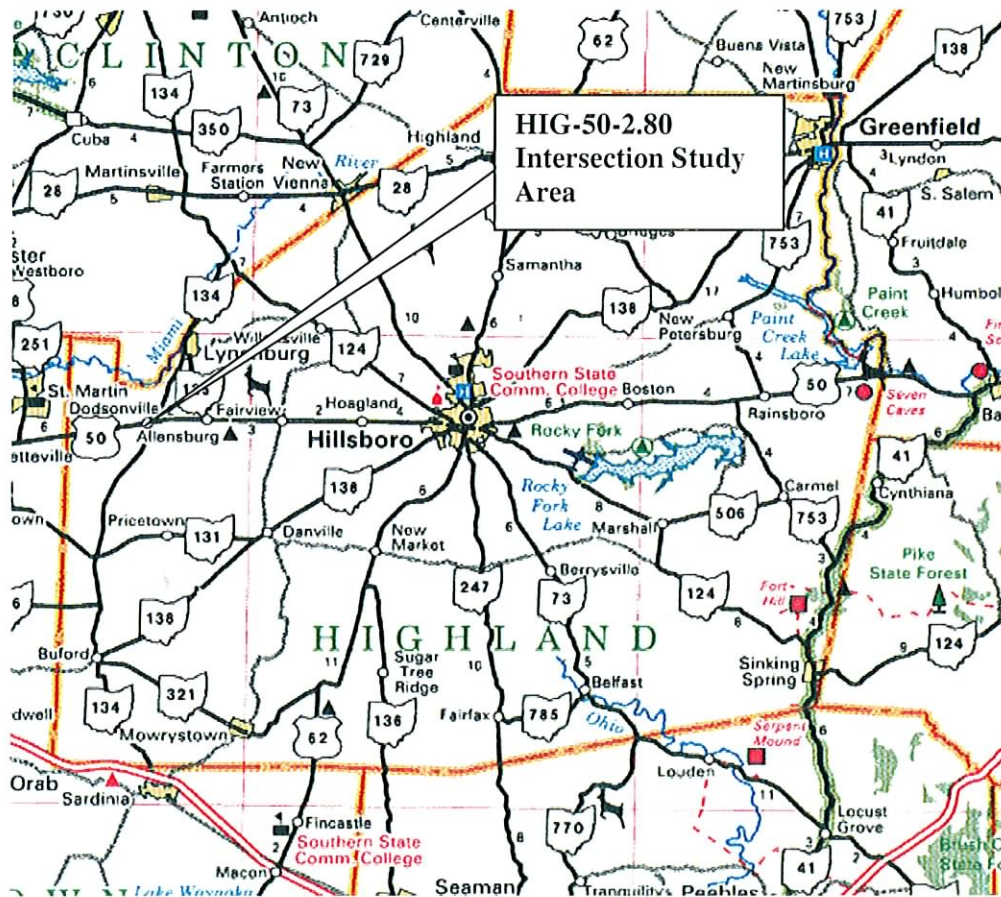
USR 50 & SR 134

Narrative

INTERSECTION STUDY NARRATIVE

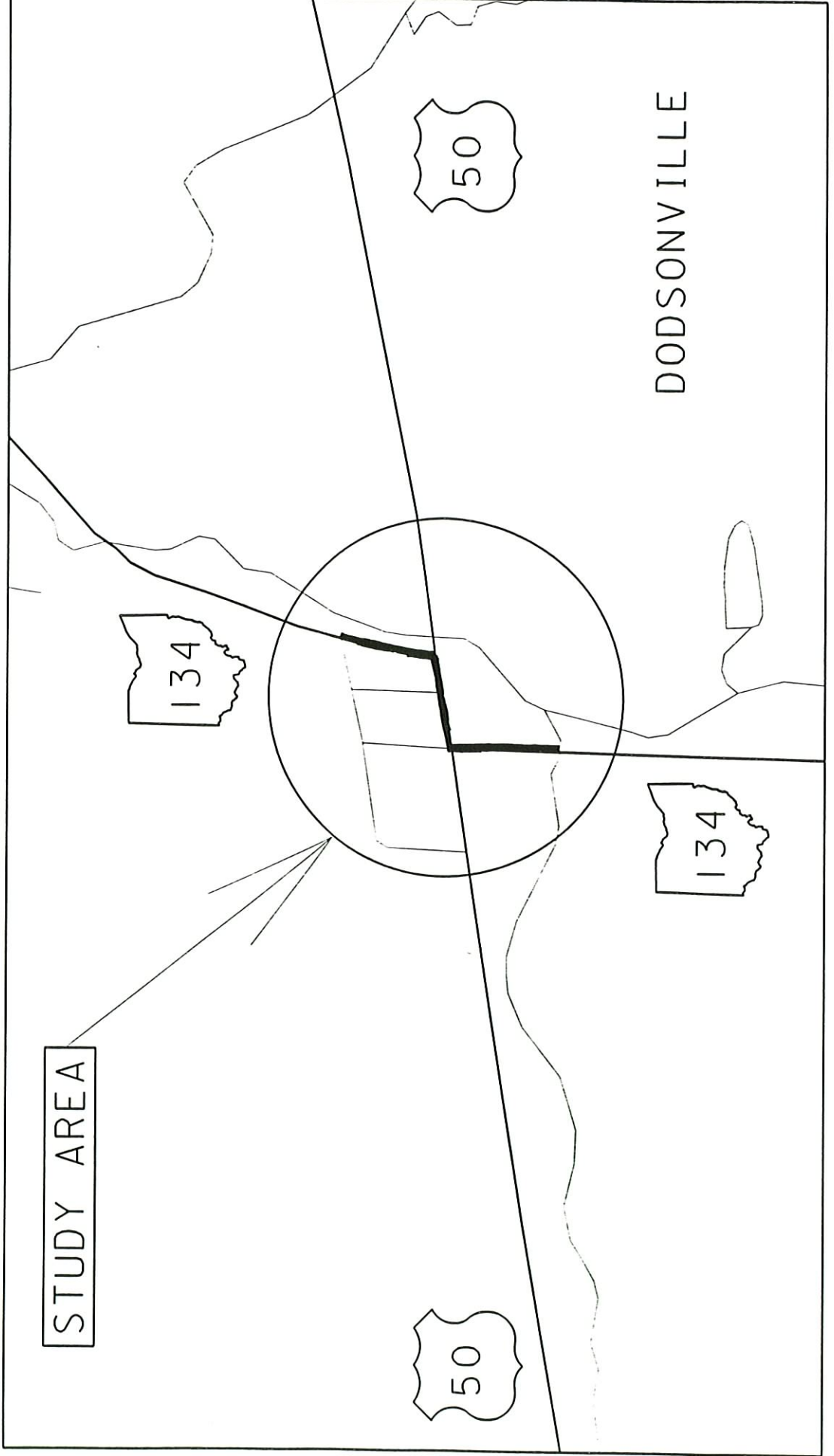
The purpose of this intersection study is to assess site physical conditions, provide several preliminary alignment and profile alternatives based upon “45-MPH” intersection sight distance (ISD) and stopping sight distance (SSD) design criteria. In addition, it is the intent to identify and recommend several cost-effective countermeasures designed to enhance traffic operation and safety by increasing intersection performance efficiency. An additional purpose is to evaluate environmental and right-of-way impacts of each alternative. Cost comparisons of the various alternatives are also presented herein.

STUDY AREA MAP



STUDY AREA DESCRIPTION

United States Route 50 is classified as a rural arterial east-west route. It intersects the north-south route SR 134 in the unincorporated community of Dodsonville in Dodson Township in Highland County, Ohio. The south leg (or northbound approach) and the north leg (or southbound approach) do not intersect USR 50 at the same point resulting in a jogged intersection for SR 134 traffic. A distance of approximately 350 feet separates the SR 134 approaches. An elementary and high school complex is soon to be opened near the study location. The school complex is located approximately 1/2 mile south on SR 134 from the study area and it will generate typical school type traffic such as school buses, cars, and pedestrian traffic. The posted speed on USR 50 is 45 MPH. SR 134 is posted at 55 MPH, but has “Reduce Speed Ahead” signs (R-11Bs) posted on the SR 134 approaches. See the enlarged study area diagram for more details on the following page.



STUDY AREA

DODSONVILLE



Northbound SR 134 traffic arriving at the stopped approach to USR 50 are presented with a crest vertical curve to their left which significantly limits their cross corner or intersection sight distance. While on the other hand, they are presented with a sag vertical curve to the right due to the presence of the lower lying ground and the bridge over Snitch Creek. Likewise, southbound SR 134 traffic arriving at the stopped approach to USR 50 are presented with a crest vertical curve to their right which significantly limits their cross corner or intersection sight distance. While on the other hand, they are presented with a sag vertical curve to the left due to the presence of the lower lying ground and the bridge over Snitch Creek.

EXISTING CONDITIONS WITHIN THE STUDY AREA

The existing study area is basically an intersection with two intersecting approaches offset approximately 350 feet. USR 50 is the major road with the SR 134 approaches operating as minor roads. The crest vertical curve to the west of the intersection coupled with the sag vertical curve to the east along with the SR 134 offset approaches make this intersection difficult for many motorists to negotiate safely. Furthermore, the west intersection operates with an intersection control beacon, which provides a caution warning to USR 50 traffic of the intersection's existence. The following accident, volume, and speed data further describe the existing characteristics of the study location.

TRAFFIC ACCIDENT DATA

During the three year period beginning January 1, 1997 and ending December 31, 1999 there were four accidents. Three were logged for the west intersection of USR 50 and SR 134 and one was logged for the east intersection of USR 50 and SR 134. The accident data is summarized in the following table:

ACCIDENT DATA SUMMARY	<i>Roadway</i>			
Date	08/12/97	07/20/98	11/13/98	02/22/97
Intersection	West	West	West	East
Time of Day	12:00 PM	11:10 AM	1:35 PM	8:00 PM
Day of Week	Tuesday	Monday	Friday	Sunday
Light Conditions	Daylight	Daylight	Daylight	Dark
Fatality	None	None	None	None
Injury	None	Yes	None	None
PDO	Yes	None	Yes	Yes
Weather Conditions	Clear	Clear	Clear	Clear
Road Conditions	Dry	Dry	Dry	Dry

Driver characteristics associated with these four accidents are presented in the table below. The predominant accident type appears to be angle accidents. However, the sheer lack of a greater number of Accidents over a three-year period limit any statistically significant accident pattern that could be established. It also makes it difficult selecting any associated realistic countermeasure based upon such limited accident data.

<i>ACCIDENT DATA SUMMARY Driver</i>				
Accident Type	Rear End	Angle	Angle	Angle
Direction At Fault Driver	WB USR 50	NB SR 134	NB SR 134	NB SR 134
Speed At Fault Driver	35 MPH	35 MPH	10 MPH	30 MPH
Driver Condition	Normal	Normal	Normal	Normal
Violation	UACD	FTY	FTY	FTY

TRAFFIC VOLUME DATA

The project design designation data is as described in the table below:

<i>PROJECT DESIGN DESIGNATION INFORMATION</i>	
Opening Year Average Daily Traffic --- 2002	3300
Design Year Average Daily Traffic --- 2022	3900
Design Hour Volume --- 2022	390
Directional Distribution	55%
Trucks (24 Hour B & C)	13%

SPEED DATA

The speed data collected for this location by District Nine personnel is included within this report in the Appendix. The speed statistics summary based upon this data are as follows for the each direction of travel on USR 50 as shown in the table below:

<i>SPEED STATISTIC PARAMETER</i>	<i>SPEED PARAMETER VALUE</i>	<i>SPEED PARAMETER VALUE</i>
SPEED MEASUREMENT DIRECTION	WESTBOUND	EASTBOUND
15 th PERCENTILE SPEED	40 MPH	39 MPH
MEDIAN SPEED	44 MPH	44 MPH
AVERAGE SPEED -ALL VEHICLES	46.5 MPH	45.1 MPH
85 th PERCENTILE SPEED	50 MPH	49 MPH
95 th PERCENTILE SPEED	54 MPH	54 MPH
10 MPH PACE SPEED	40-50 MPH	40-50 MPH
NUMBER OF VEHICLES IN PACE	65	65
PERCENT OF VEHICLES IN PACE	81.25%	87.84%
NUMBER OF VEHICLES > 55 MPH	5	3
PERCENT OF VEHICLES > 55 MPH	6.25%	4.05%

DESCRIPTIONS OF ALTERNATIVE IMPROVEMENTS & CORRESPONDING IMPACTS

Alternative # 1 “Cut-Down-the-Crest-Vertical-Curves” on West Leg of USR 50 & South Leg of SR 134

This alternative consists of two parts. The first is cutting the crest vertical curve or lowering the roadway profile on USR 50 from approximately station 12+75 to station 18+10. The cutting may be severe or moderate depending on cost and cross section impacts on USR 50. The purpose being to improve the stopping sight distance (SSD) and the intersection sight distance (ISD) using a 3.5 feet “height-of-eye” and a 4.25 feet “height-of-object” standards based upon a design speed of 45 MPH.

The second improvement is cutting the crest vertical curve or lowering the roadway profile on SR 134 on the south leg for northbound traffic from approximately station 12+40 to station 15+33. The cutting may be severe or moderate depending on cost and cross section impacts on SR 134. The purpose being to improve the stopping sight distance (SSD) and the intersection sight distance (ISD) using a 3.5 feet “height-of-eye” and a 4.25 feet “height-of-object” standards based upon a design speed of 45 MPH.

The negative impact of this alternative is that it lowers the pavement elevation for frontage properties along both USR 50 and SR 134. This causes what amounts to real damage in that adjustments to steps, sidewalks, and a handicapped entrance ramp, to one particular residence, would all have to be made to tie the adjacent property frontages to the lower profile alignment. These impacts will be more severe for USR 50 property frontages than for SR 134 frontages.

Right-of-Way easements would be needed for the construction of U.S. 50 and U.S. 134. This would include ten foot easements on the north and south sides of U.S. 50 as well as ten foot easements on the east and west sides of U.S. 134. The total area of the easements is approximately 0.5 acres and would be affecting eight parcels along these easements.

In addition, two variations of this alternative are feasible. The first involves cutting the existing profiles on both USR 50 and SR 134 South Approach to meet ODOT standards, while, the other variation involves more moderate profile cuts. The more moderate cuts would require design exception approval. Although meeting required standards is always desirable for improvements, fiscal restraints should be considered.

Maintaining traffic operations will be significant with this alternative as “half-width” construction techniques are mandated for it. Lost capacity during the various construction phases will result in significant delays.

After a cursory field review of the project site, it appears that there are no significant issues regarding hazardous waste, wetlands and farmlands or other major environmental concerns related to this alternative. A cultural resource literature search would be required if this alternative is selected.

<See Figure 1-1a and 1-1b>

Alternative # 2 “Raise-the-Sag-Vertical-Curve”on East Leg of USR 50

This alternative involves raising the profile of USR 50 from approximately station 15+00 to station 25+00 in order to improve the stopping sight distance (SSD) and the intersection sight distance (ISD). Use of a 3.5 feet “height-of-eye” and a 4.25 feet “height-of-object” standards based upon a design speed of 45 MPH would be appropriate.

The negative impact of this alternative is that it is not realistic from a cost containment perspective and was not pursued as a feasible or practical solution. This alternative involves a section of USR 50 with a bridge over Snitch Creek. Raising the roadway profile for USR 50 by several feet over Snitch Creek is economically prohibitive. The construction cost for this alternative in contrast to benefit gained would not be justified on the basis of sound engineering economic principles.

Construction of this alternative would mandate complete closure of all intersection approaches on both USR 50 and SR 134.

After a cursory field review of the project site, it appears that there are no significant issues regarding hazardous waste, wetlands and farmlands or other major environmental concerns related to this alternative. Raising the sag vertical curve would most likely require an ecological survey for Snitch Creek. A cultural resource literature search would be required if this alternative is selected.

Right-of-Way impacts associated with this cost-prohibitive alternative were not developed.

Alternative # 3 “Realign NB SR 134 Approach—Without Elimination of the Intersection Jog”

This alternative involves relocation of the south leg for northbound SR 134 traffic so that it intersects USR 50 at station 14+95 rather than at its current intersection at station 16+75. This realignment scheme for this approach essentially moves the present T-intersection to the west a sufficient distance, so that it intersects USR 50 near the top of the crest vertical curve. Thus resulting in improved stopping sight distance (SSD) for USR 50 traffic and intersection sight distance (ISD) for SR 134 northbound traffic.

Right-of-Way acquisition would be needed as well as removal of three existing structures (house trailer, business auto repair shop, and wood frame house) for the new alignment of U.S. 134. The new alignment would involve three parcels with a total Right-of-Way take of approximately 1.0 acres.

The negative impact of this alternative is that it would require taking one residential property, one business property and one combined residential/business property in order to provide for the new approach alignment and connection to USR 50. Its adoption still results in SR 134 approaches being offset to an even greater distance.

Maintaining traffic operations will be less significant for this alternative as “half-width” construction techniques are not required. The realigned south approach of SR 134 will be all new construction and will not have significant direct negative impacts on USR 50 and SR 134 traffic. Some capacity losses during the various construction phases will result in moderate delays.

After a cursory field review of the project site, it appears that there are no significant issues regarding hazardous waste, wetlands and farmlands or other major environmental concerns related to this alternative. A cultural resource literature search would be required if this alternative is selected.

<See Figure 1-2>

Alternative # 4 “Realign NB SR 134 Approach—With Elimination of the Intersection Jog”

This alternative involves relocation of the south leg for northbound SR 134 traffic so that it intersects USR 50 at station 20+35 rather than at its current intersection at station 16+75. This realignment scheme for this approach essentially moves the present T-intersection to the east a sufficient distance, so that it intersects USR 50 near the bottom of the sag vertical curve. This alternative will result in improved stopping sight distance (SSD) for USR 50 traffic and intersection sight distance (ISD) for SR 134 northbound and southbound traffic, as well as, aligning the north and south legs of SR 134 to be across from each other.

Right-of-Way would also need to be acquired for the new alignment. Two parcels would be affected by this new alignment including two existing structures (barn and barn/garage). The total amount of Right-of-Way acquired is approximately 1.0 acres.

The negative impacts of this alternative is that it would require taking portions of two farm/residential properties with each having barns that would require demolition. One of the two barns, the one closer to USR 50 is currently falling and in a state of disrepair.

Maintaining traffic operations will be less significant for this alternative as “half-width” construction techniques are not required. The realigned south approach of SR 134 will be all new construction and will not have significant direct negative impacts on USR 50 and SR 134 traffic. Some capacity losses during the various construction phases will result in moderate delays.

After a cursory field review of the project site, it appears that there are no significant issues regarding hazardous waste, wetlands and farmlands or other major environmental concerns related to this alternative. A cultural resource literature search would be required if this alternative is selected.

In regard to the historical impacts associated with this alternative, the following is offered. The two-story wood frame barn located along the eastside of the south intersection leg of the west T-intersection of USR 50 and SR 134 at Station 12+75, 45' right is potentially historic. If this is determined to be the case after more study, a moderate variation of this alternative's horizontal alignment can be developed to avoid the need to take this structure. This would result in additional construction costs of approximately \$33,000.00.

In addition, the combination wood frame structure, dilapidated barn and block garage located along the south side of the east T-intersection of USR 50 and SR 134 at Station 19+75, 45' right has probably been altered too much to be eligible for inclusion in the National Register of Historic Buildings.

<See Figure 1-3>

CONSTRUCTION COST ESTIMATES FOR EACH ALTERNATIVE IMPROVEMENT

Alternative # 1 "Cut-Down-the-Crest-Vertical-Curves" on West Leg of USR 50 & South Leg of SR 134

The approximate construction cost estimate for this alternative is \$322,000.

Alternative # 2 "Raise-the-Sag-Vertical-Curve" on East Leg of USR 50

This alternative is assumed to be cost prohibitive, therefore no approximate cost was developed.

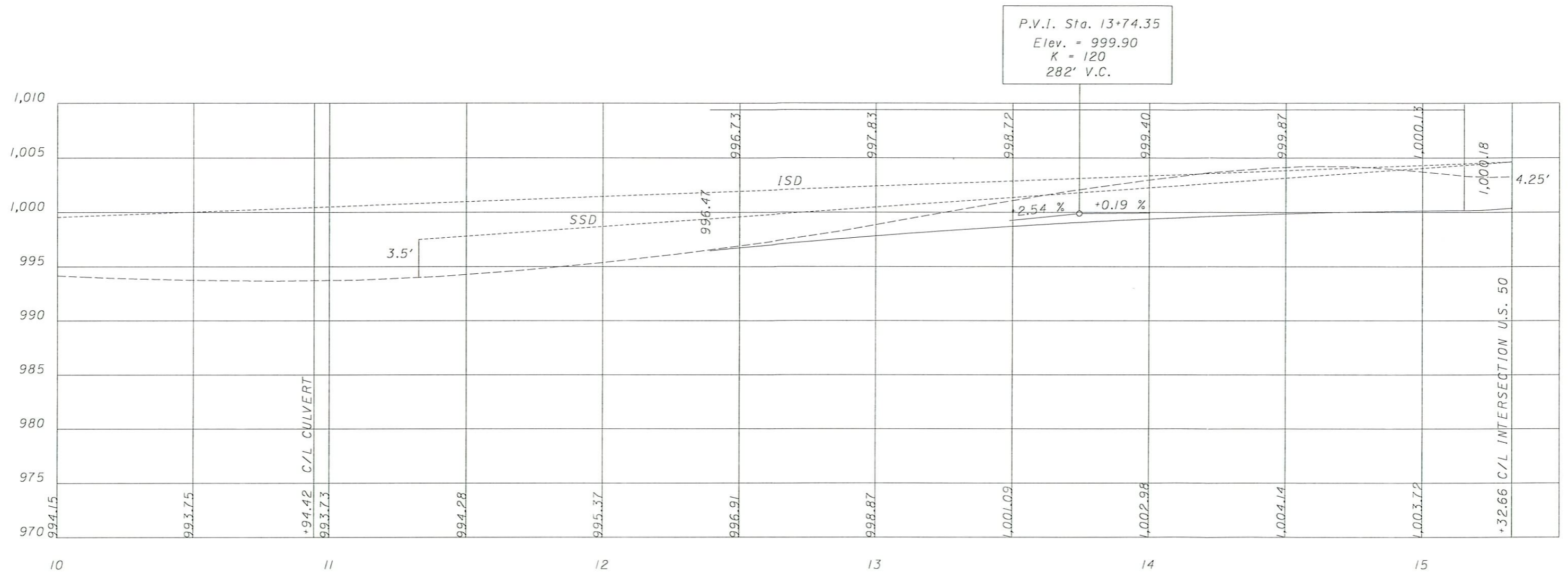
Alternative # 3 "Realign NB SR 134 Approach—Without Elimination of the Intersection Jog"

The approximate construction cost estimate for this alternative is \$524,000.

Alternative # 4 "Realign NB SR 134 Approach—With Elimination of the Intersection Jog"

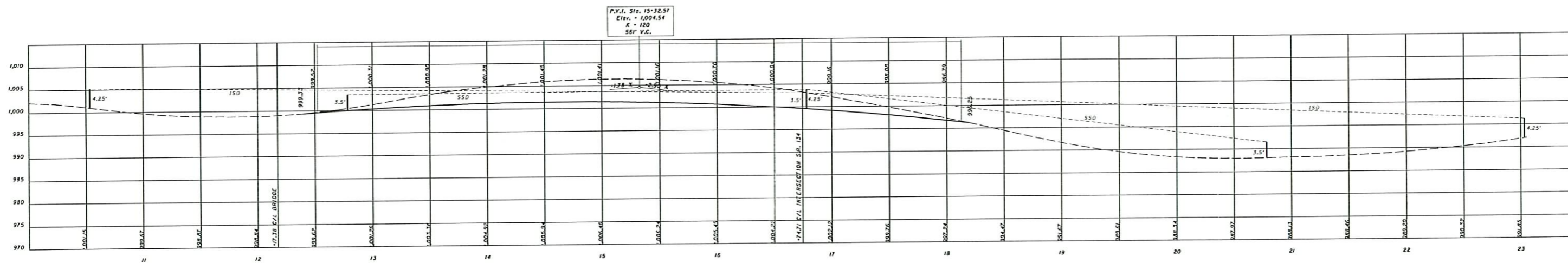
The approximate construction cost estimate for this alternative is \$297,000.

The Construction Costs for each Alternative are described in detail in Section 3 of this document.



S.R. 134 - Existing Alignment Proposed Profile Alternative No. 1

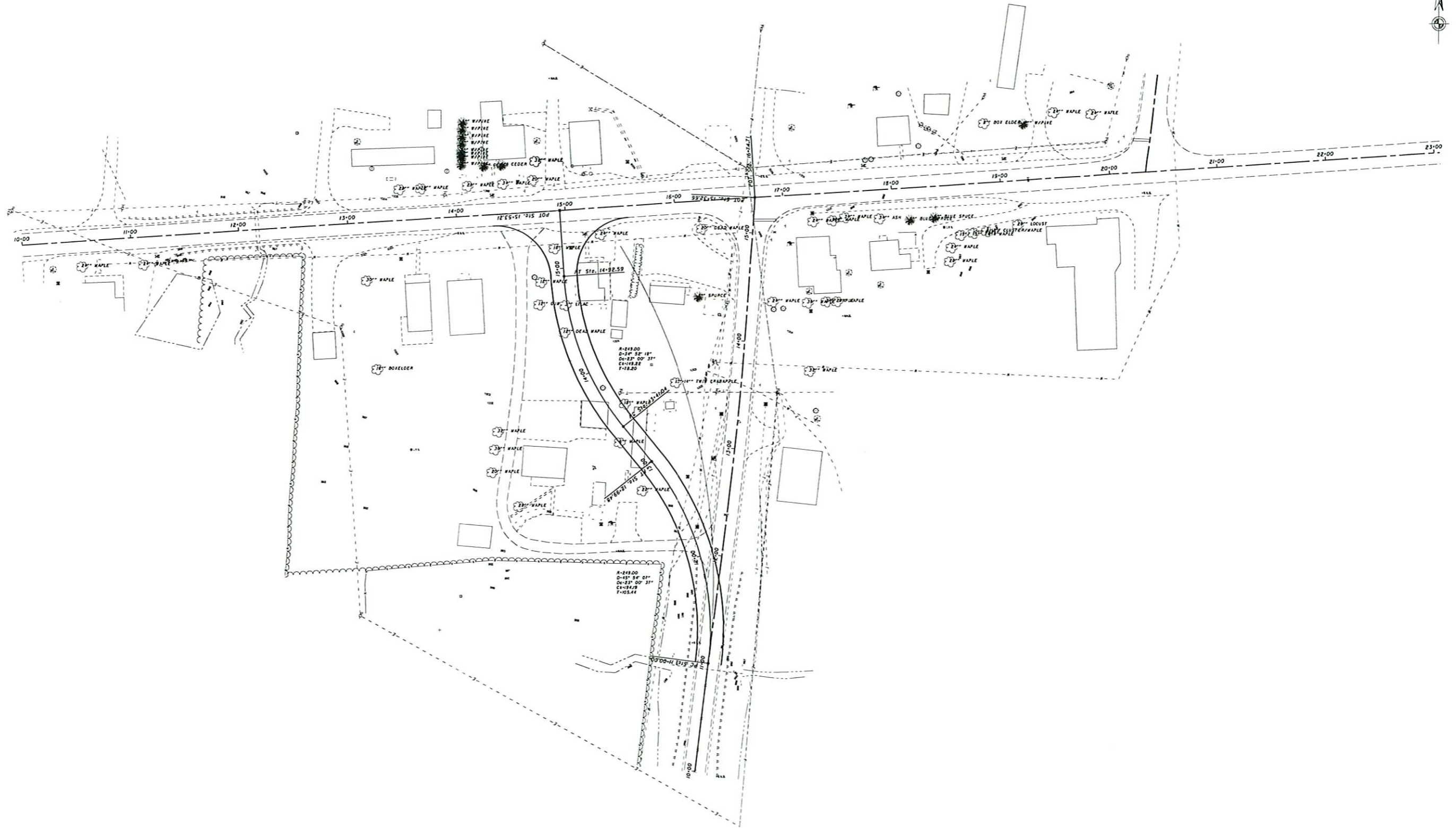
Figure 1-1a



U.S. 50 - Existing Alignment Proposed Profile Alternative No. 1

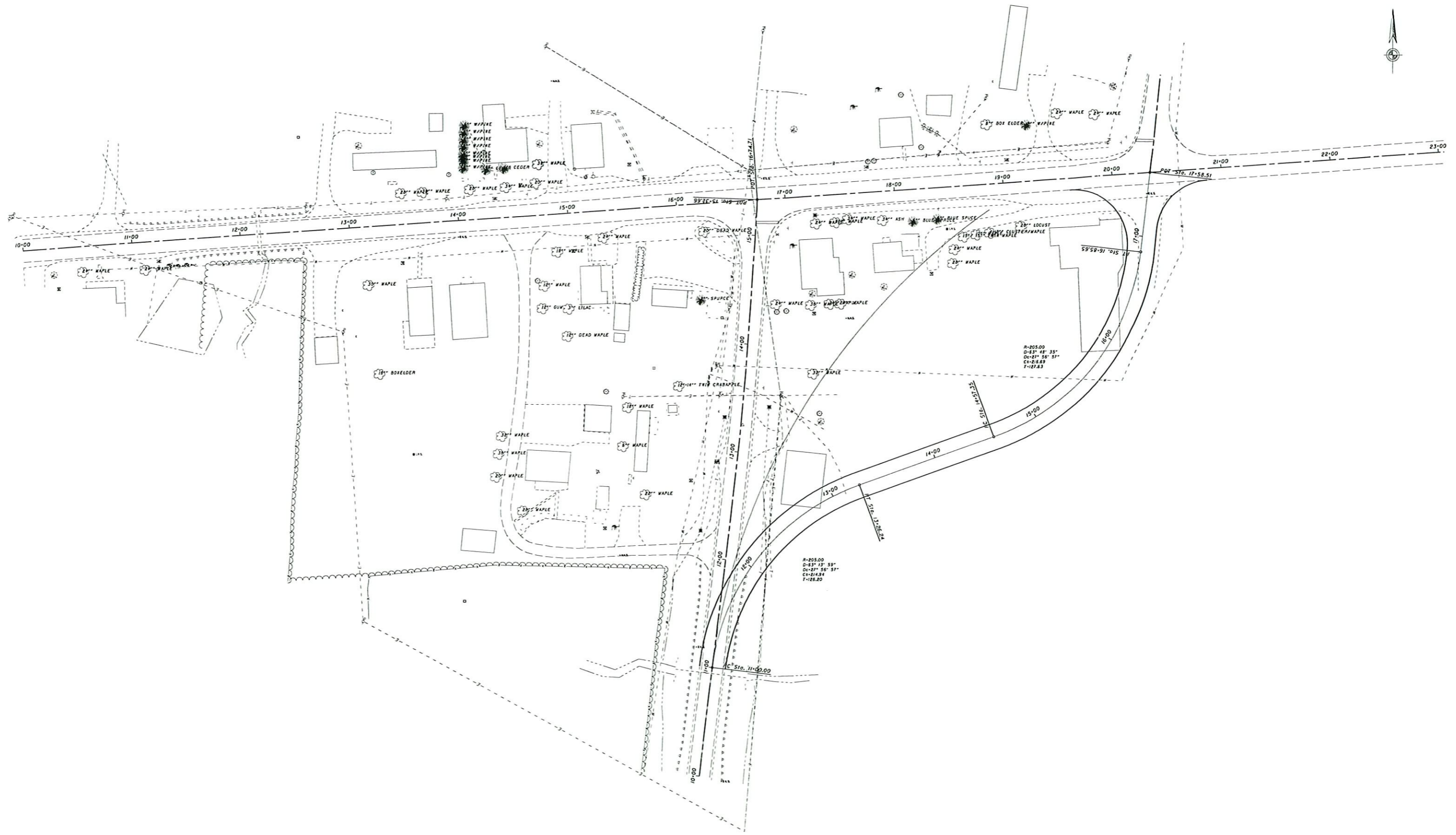
Figure 1-1b





S.R. 134 - Proposed Alignment Alternative No. 3

Figure 1-2



S.R. 134 - Proposed Alignment Alternative No. 4

Figure 1-3

USR 50 & SR 134

Photographs of Study Site

LOOKING EAST ON WEST LEG OF USR 50 & SR 134



LOOKING EAST ON USR 50 1,000 FEET FROM INTERSECTION



LOOKING EAST ON USR 50 800 FEET FROM INTERSECTION



LOOKING EAST ON USR 50 600 FEET FROM INTERSECTION



LOOKING EAST ON USR 50 400 FEET FROM INTERSECTION



LOOKING EAST ON USR 50 200 FEET FROM INTERSECTION

LOOKING WEST ON EAST LEG OF USR 50 & SR 134



LOOKING WEST ON USR 50 1,000 FEET FROM INTERSECTION



LOOKING WEST ON USR 50 800 FEET FROM INTERSECTION



LOOKING WEST ON USR 50 600 FEET FROM INTERSECTION



LOOKING WEST ON USR 50 400 FEET FROM INTERSECTION



LOOKING WEST ON USR 50 200 FEET FROM INTERSECTION

**LOOKING NORTH ON SOUTH LEG OF SR 134 & USR 50
WEST INTERSECTION**



LOOKING NORTH ON SR 134 1,000 FEET FROM INTERSECTION



LOOKING NORTH ON SR 134 800 FEET FROM INTERSECTION



LOOKING NORTH ON SR 134 600 FEET FROM INTERSECTION



LOOKING NORTH ON SR 134 400 FEET FROM INTERSECTION



LOOKING NORTH ON SR 134 200 FEET FROM INTERSECTION

CROSS CORNER SIGHT DISTANCE FOR EAST AND WEST INTERSECTIONS



ISD (CCSD)--LOOKING EAST FROM SR 134 SOUTHBOUND APPROACH OR NORTH LEG AT EAST INTERSECTION



ISD(CCSD)--LOOKING WEST FROM SR 134 SOUTHBOUND APPROACH
OR NORTH LEG AT EAST INTERSECTION



ISD(CCSD)--LOOKING WEST FROM SR 134 NORTHBOUND APPROACH
OR SOUTH LEG AT WEST INTERSECTION



ISD(CCSD)--LOOKING EAST FROM SR 134 NORTHBOUND APPROACH
OR SOUTH LEG AT WEST INTERSECTION

**LOOKING SOUTH ON US 134 ON NORTH LEG OF USR 50/SR
134 EAST INTERSECTION**



LOOKING SOUTH ON SR 134 / 1000 FEET FROM INTERSECTION



LOOKING SOUTH ON SR 134 / 800 FEET FROM INTERSECTION



LOOKING SOUTH ON SR 134 / 600 FEET FROM INTERSECTION



LOOKING SOUTH ON SR 134 / 400 FEET FROM INTERSECTION



LOOKING SOUTH ON SR 134 / 200 FEET FROM INTERSECTION



LOOKING SOUTH ON SR 134 / 100 FEET FROM INTERSECTION

VARIOUS LAND USE DESCRIPTIONS



LAND USE EAST INTERSECTION SOUTH OF US 50



LAND USE EAST INTERSECTION SOUTH OF US 50



LAND USE EAST INTERSECTION SOUTH OF US 50

LOOKING WEST ON USR 50 FROM EAST INTERSECTION



US 50 WESTBOUND



US 50 WESTBOUND (LAND USE KARATE SCHOOL)



US 50 WESTBOUND



US 50 WESTBOUND

LOOKING EAST ON USR 50 FROM WEST INTERSECTION



US 50 EASTBOUND



US 50 EASTBOUND



US 50 EASTBOUND



INTERSECTION CONTROL BEACON (WEST INTERSECTION)



INTERSECTION CONTROL BEACON (WEST INTERSECTION)

CULVERT OVER SNITCH CREEK



CULVERT ON US 50, EAST OF PROJECT



CULVERT ON US 50, EAST OF PROJECT



CULVERT ON US 50, EAST OF PROJECT

CEMETERY ALONG WEST SIDE OF SR 134 SOUTHBOUND



CEMETARY NEAR PROJECT SITE



CEMETARY NEAR PROJECT SITE



CEMETARY NEAR PROJECT SITE

**NEW SCHOOL COMPLEX SITE HALF MILE SOUTH OF USR
50 ON SR 134 SOUTH LEG**



SCHOOL SITE NEAR PROJECT SITE



SCHOOL SITE NEAR PROJECT SITE



SCHOOL SITE NEAR PROJECT SITE

USR 50 & SR 134

Cost Estimates

COST ESTIMATES FOR INTERSECTION IMPROVEMENTS

	Alternative #1	Alternative#2	Alternative #3	Alternative #4
Roadway	\$168,800.75	Cost Prohibitive	\$143,472.50	\$156,219.40
Traffic Control	\$20,247.25	Cost Prohibitive	\$26,579.25	\$26,579.25
Highway Lighting	\$15,715.00	Cost Prohibitive	\$15,715.00	\$15,715.00
Maintaining Traffic	\$74,998.80	Cost Prohibitive	\$29,975.80	\$29,975.80
Land & Buildings	\$0.00	Cost Prohibitive	\$240,000.00	\$30,000.00
15% Contingency	\$41,964.27	Cost Prohibitive	\$68,361.38	\$38,773.42
Project Total	\$321,726.07	Cost Prohibitive	\$524,103.93	\$297,262.87

Total Project Cost Analysis

Alternative #4 - Realign South Leg SR 134 to East	\$297,262.87
Alternative #1 - Lower Profiles on USR 50 and SR 134 South Leg	\$321,726.07
Alternative #3 - Realign South Leg SR 134 to West	\$524,103.93
Alternative #2 - Raise Sag Vertical Curve on USR 50	Cost Prohibitive

ALTERNATIVE # 1--LOWER PROFILES ON USR 50 AND SR 134 SOUTH LEG

<u>ITEM NO</u>	<u>DESCRIPTION</u>	<u>ESTIMATED QUANTITIES</u>	<u>UNIT</u>	<u>UNIT COST TOTAL</u>	<u>TOTAL COST</u>
Roadway					
202	Pavement Removed	1500	S.Y.	\$ 6.00	\$ 9,000.00
202	Walk Removed	75	S.Y.	\$ 0.65	\$ 48.75
202	Tree Removed 30"	4	EACH	\$ 750.00	\$ 3,000.00
203	Excavation	10000	C.Y.	\$ 5.00	\$ 50,000.00
203	Embankment	1000	C.Y.	\$ 4.00	\$ 4,000.00
203	Subgrade Compaction	2400	S.Y.	\$ 1.00	\$ 2,400.00
301	Bituminous Aggregate Base	600	C.Y.	\$ 55.00	\$ 33,000.00
304	Aggregate Base	410	C.Y.	\$ 22.00	\$ 9,020.00
448	Asphalt Concrete, Surface Course	80	C.Y.	\$ 70.00	\$ 5,600.00
448	Asphalt Concrete, Intermediate Course	110	C.Y.	\$ 72.00	\$ 7,920.00
408	Bituminous Prime Coat	960	GAL	\$ 1.00	\$ 960.00
448	Asphalt Concrete, Surface Course Driveways	15	C.Y.	\$ 100.00	\$ 1,500.00
448	Asphalt Concrete, Intermediate Course Driveways	15	C.Y.	\$ 86.00	\$ 1,290.00
605	Aggregate Drains	10	C.Y.	\$ 7.00	\$ 70.00
870	Seeding and Mulching	1800	S.Y.	\$ 0.50	\$ 900.00
610	Retaining Wall	70	S.Y.	\$ 250.00	\$ 17,500.00
608	Concrete Steps	22	L.F.	\$ 86.00	\$ 1,892.00
690	Special Mailbox Support	2	Each	\$ 100.00	\$ 200.00
877	Erosion Control	Lump		\$ 8,000.00	\$ 8,000.00
619	Field Office	Lump		\$ 4,500.00	\$ 4,500.00
623	Construction Staking	Lump		\$ 4,000.00	\$ 4,000.00
624	Mobilization	Lump		\$ 4,000.00	\$ 4,000.00
	SUBTOTAL				\$ 168,800.75
Traffic Control					
642	Edge Line	1.14	MILE	\$ 1,030.00	\$ 1,170.45
642	Center Line	0.57	MILE	\$ 1,955.00	\$ 1,110.80
642	Stop Line	96.00	L.F.	\$ 5.00	\$ 480.00
202	Raised Pavement Marker Removed for Storage	38	EACH	\$ 5.00	\$ 190.00
621	Raised Pavement Marker Installation Only	38	EACH	\$ 12.00	\$ 456.00
621	Raised Pavement Marker Casting Installation Only	5	EACH	\$ 11.00	\$ 55.00
621	Prismatic Retroreflector	5	EACH	\$ 7.00	\$ 35.00
632	Removal of Intersection Control Beacon, as per Plan	1	EACH	\$ 1,870.00	\$ 1,870.00
632	Vehicular Signal Head, 1-Section, 12 Inch Lens 4-Way	2	EACH	\$ 685.00	\$ 1,370.00
632	Strain Pole, Type TC-81.10M, Design 1	2	EACH	\$ 1,225.00	\$ 2,450.00
632	Strain Pole Foundation	2	EACH	\$ 1,600.00	\$ 3,200.00
633	Flasher Control Unit	1	EACH	\$ 770.00	\$ 770.00
632	Messenger Wire 7 Strand 3/8 Inch	60	L.F.	\$ 6.00	\$ 360.00
632	Signal Cable, 3-Conductor, No. 14 AWG	60	L.F.	\$ 2.00	\$ 120.00
632	Power Service	1	EACH	\$ 975.00	\$ 975.00
632	Power Cable, 2-Conductor, No. 8 AWG	50	L.F.	\$ 2.00	\$ 100.00
632	Conduit Riser, 2 Inch Diameter	20	L.F.	\$ 270.00	\$ 5,400.00
625	Ground Rod	1	EACH	\$ 135.00	\$ 135.00
	SUBTOTAL				\$ 20,247.25

Highway Lighting					
625	Light Pole	2	EACH	\$ 1,340.00	\$ 2,680.00
625	Light Pole Foundation	2	EACH	\$ 1,130.00	\$ 2,260.00
625	Ground Rod	2	EACH	\$ 135.00	\$ 270.00
625	Pull Box, Type 713.08, 18 Inch	3	EACH	\$ 465.00	\$ 1,395.00
625	Trench	150	L.F.	\$ 3.00	\$ 450.00
625	Trench In Paved Areas, Type A	50	L.F.	\$ 25.00	\$ 1,250.00
625	Trench In Paved Areas, Type B	50	L.F.	\$ 20.00	\$ 1,000.00
625	Conduit, 2 Inch, 713.07, Type-II or III	150	L.F.	\$ 5.00	\$ 750.00
625	Transformer Base	2	EACH	\$ 385.00	\$ 770.00
625	No.-10 AWG, Pole and Bracket Cable	100	L.F.	\$ 0.50	\$ 50.00
625	Power Service	1	EACH	\$ 2,255.00	\$ 2,255.00
625	Cable Splicing Kit	4	EACH	\$ 60.00	\$ 240.00
625	1-1/2 Inch Duct-Cable with 3 No. 4 AWG, 5,000-Volt Cables	400	L.F.	\$ 3.00	\$ 1,200.00
625	High Voltage Test	Lump		\$ 1,145.00	\$ 1,145.00
	SUBTOTAL				\$ 15,715.00
MAINTAINING TRAFFIC					
614	Sign, Flat Sheet	300	S.F.	\$ 14.00	\$ 4,200.00
614	Work Zone Speed Limit Sign Overlay	5	EACH	\$ 120.00	\$ 600.00
614	Work Zone Marking Sign	10	EACH	\$ 85.00	\$ 850.00
614	Double Fines In Work Zone Sign	5	EACH	\$ 145.00	\$ 725.00
614	Temporary Edge Line, Class 1	1.14	MILE	\$ 670.00	\$ 763.80
614	Temporary Raised Pavement Markers, Type A	40	EACH	\$ 4.00	\$ 160.00
622	Portable Concrete Barrier, 32 Inch, as per Plan	1000	L.F.	\$ 12.00	\$ 12,000.00
626	Barrier Reflectors, Type B	40	EACH	\$ 5.00	\$ 200.00
614	Object Markers	40	EACH	\$ 9.00	\$ 360.00
614	Temporary Impact Attenuators	2	EACH	\$ 6,000.00	\$ 12,000.00
615	Temporary Pavement (pg. 64 Binder), Class A	300	S.Y.	\$ 20.00	\$ 6,000.00
614	Bituminous Concrete for Maintaining Traffic	40	C.Y.	\$ 135.00	\$ 5,400.00
616	Water	50	M.GAL	\$ 20.00	\$ 1,000.00
616	Calcium Chloride	9	TON	\$ 200.00	\$ 1,800.00
614	Portable Changeable Message Signs, as per Plan	3	SIGN-MO.	\$ 1,480.00	\$ 4,440.00
614	Replacement Drums	20	EACH	\$ 60.00	\$ 1,200.00
614	Replacement Signs	20	EACH	\$ 10.00	\$ 200.00
614	Removal of Pavement Markings	1000	L.F.	\$ 0.50	\$ 500.00
614	Law Enforcement Officer with Patrol Car	360	HOUR	\$ 35.00	\$ 12,600.00
614	Maintaining Traffic	Lump		\$ 10,000.00	\$ 10,000.00
	SUBTOTAL				\$ 74,998.80
	15% Contingency				\$ 41,964.27
PROJECT TOTAL					\$ 321,726.07

ALTERNATIVE # 3--REALIGN SOUTH LEG SR 134 TO WEST

<u>ITEM NO</u>	<u>DESCRIPTION</u>	<u>ESTIMATED QUANTITIES</u>	<u>UNIT</u>	<u>UNIT COST TOTAL</u>	<u>TOTAL COST</u>
	Roadway				
202	Structure Removal	Lump		\$ 24,000.00	\$ 24,000.00
202	Pavement Removed	1600	S.Y.	\$ 6.00	\$ 9,600.00
202	Guardrail Removed	400	L.F.	\$ 1.00	\$ 400.00
202	Catch Basin Removed	1	EACH	\$ 220.00	\$ 220.00
202	Pipe Removed	80	L.F.	\$ 12.00	\$ 960.00
203	Excavation	1500	C.Y.	\$ 5.00	\$ 7,500.00
203	Embankment	5500	C.Y.	\$ 4.00	\$ 22,000.00
203	Subgrade Compaction	2017.5	S.Y.	\$ 1.00	\$ 2,017.50
301	Bituminous Aggregate Base	650	C.Y.	\$ 55.00	\$ 35,750.00
304	Aggregate Base	340	C.Y.	\$ 22.00	\$ 7,480.00
448	Asphalt Concrete, Surface Course	70	C.Y.	\$ 70.00	\$ 4,900.00
448	Asphalt Concrete, Intermediate Course	90	C.Y.	\$ 72.00	\$ 6,480.00
408	Bituminous Prime Coat	810	GAL	\$ 1.00	\$ 810.00
605	Aggregate Drains	15	C.Y.	\$ 7.00	\$ 105.00
870	Seeding and Mulching	3200	S.Y.	\$ 0.50	\$ 1,600.00
877	Erosion Control	Lump		\$ 7,150.00	\$ 7,150.00
619	Field Office	Lump		\$ 4,500.00	\$ 4,500.00
623	Construction Staking	Lump		\$ 4,000.00	\$ 4,000.00
624	Mobilization	Lump		\$ 4,000.00	\$ 4,000.00
	SUBTOTAL				\$ 143,472.50
	Traffic Control				
642	Edge Line	1.14	MILE	\$ 1,030.00	\$ 1,170.45
642	Center Line	0.57	MILE	\$ 1,955.00	\$ 1,110.80
642	Stop Line	96.00	L.F.	\$ 5.00	\$ 480.00
202	Raised Pavement Marker Removed for Storage	38	EACH	\$ 5.00	\$ 190.00
621	Raised Pavement Marker Installation Only	38	EACH	\$ 12.00	\$ 456.00
621	Raised Pavement Marker Casting Installation Only	5	EACH	\$ 11.00	\$ 55.00
621	Prismatic Retroreflector	5	EACH	\$ 7.00	\$ 35.00
626	Barrier Reflector, Type A	21	EACH	\$ 6.00	\$ 126.00
630	Sign, Flat Sheet, Type G	222	S.F.	\$ 15.00	\$ 3,330.00
630	Removal of Sign and Disposal, Flat Sheet	44	EACH	\$ 8.00	\$ 352.00
630	Ground-Mounted Support, No. 3	325	L.F.	\$ 6.00	\$ 1,950.00
630	Sign Backing Assembly	2	EACH	\$ 95.00	\$ 190.00
630	Removal of Ground-Mounted Post Support and Disposal	32	EACH	\$ 12.00	\$ 384.00
632	Removal of Intersection Control Beacon, as per Plan	1	EACH	\$ 1,870.00	\$ 1,870.00
632	Vehicular Signal Head, 1-Section, 12 Inch Lens 4-Way	2	EACH	\$ 685.00	\$ 1,370.00
632	Strain Pole, Type TC-81.10M, Design 1	2	EACH	\$ 1,225.00	\$ 2,450.00
632	Strain Pole Foundation	2	EACH	\$ 1,600.00	\$ 3,200.00
632	Flasher Control Unit	1	EACH	\$ 770.00	\$ 770.00
632	Messenger Wire 7 Strand 3/8 Inch	60	L.F.	\$ 6.00	\$ 360.00
632	Signal Cable, 3-Conductor, No. 14 AWG	60	L.F.	\$ 2.00	\$ 120.00
632	Power Service	1	EACH	\$ 975.00	\$ 975.00
632	Power Cable, 2-Conductor, No. 8 AWG	50	L.F.	\$ 2.00	\$ 100.00
632	Conduit Riser, 2 Inch Diameter	20	L.F.	\$ 270.00	\$ 5,400.00
625	Ground Rod	1	EACH	\$ 135.00	\$ 135.00
	SUBTOTAL				\$ 26,579.25

	Highway Lighting				
625	Light Pole	2	EACH	\$ 1,340.00	\$ 2,680.00
625	Light Pole Foundation	2	EACH	\$ 1,130.00	\$ 2,260.00
625	Ground Rod	2	EACH	\$ 135.00	\$ 270.00
625	Pull Box, Type 713.08, 18 Inch	3	EACH	\$ 465.00	\$ 1,395.00
625	Trench	150	L.F.	\$ 3.00	\$ 450.00
625	Trench In Paved Areas, Type A	50	L.F.	\$ 25.00	\$ 1,250.00
625	Trench In Paved Areas, Type B	50	L.F.	\$ 20.00	\$ 1,000.00
625	Conduit, 2 Inch, 713.07, Type-II or III	150	L.F.	\$ 5.00	\$ 750.00
625	Transformer Base	2	EACH	\$ 385.00	\$ 770.00
625	No.-10 AWG, Pole and Bracket Cable	100	L.F.	\$ 0.50	\$ 50.00
625	Power Service	1	EACH	\$ 2,255.00	\$ 2,255.00
625	Cable Splicing Kit	4	EACH	\$ 60.00	\$ 240.00
625	1-1/2 Inch Duct-Cable with 3 No. 4 AWG, 5,000-Volt Cables	400	L.F.	\$ 3.00	\$ 1,200.00
625	High Voltage Test	Lump		\$ 1,145.00	\$ 1,145.00
	SUBTOTAL				\$ 15,715.00
	MAINTAINING TRAFFIC				
614	Sign, Flat Sheet	300	S.F.	\$ 14.00	\$ 4,200.00
614	Work Zone Marking Sign	10	EACH	\$ 85.00	\$ 850.00
614	Temporary Edge Line, Class 1	1.14	MILE	\$ 670.00	\$ 763.80
614	Temporary Raised Pavement Markers, Type A	40	EACH	\$ 4.00	\$ 160.00
622	Portable Concrete Barrier, 32 Inch, as per Plan	200	L.F.	\$ 12.00	\$ 2,400.00
626	Barrier Reflectors, Type B	8	EACH	\$ 5.00	\$ 40.00
614	Object Markers	8	EACH	\$ 9.00	\$ 72.00
615	Temporary Pavement (pg. 64 Binder), Class A	100	S.Y.	\$ 20.00	\$ 2,000.00
614	Bituminous Concrete for Maintaining Traffic	40	C.Y.	\$ 135.00	\$ 5,400.00
616	Water	20	M.GAL	\$ 20.00	\$ 400.00
616	Calcium Chloride	3	TON	\$ 200.00	\$ 600.00
614	Portable Changeable Message Signs, as per Plan	3	SIGN-MO.	\$ 1,480.00	\$ 4,440.00
614	Replacement Drums	20	EACH	\$ 60.00	\$ 1,200.00
614	Replacement Signs	20	EACH	\$ 10.00	\$ 200.00
614	Removal of Pavement Markings	1000	L.F.	\$ 0.50	\$ 500.00
614	Law Enforcement Officer with Patrol Car	50	HOUR	\$ 35.00	\$ 1,750.00
614	Maintaining Traffic	Lump			\$ 5,000.00
	SUBTOTAL				\$ 29,975.80
	Land and Buildings				
	Land and Building Purchase				\$ 240,000.00
	SUBTOTAL				\$ 240,000.00
	15% Contingency				\$ 68,361.38
	PROJECT TOTAL				\$ 524,103.93

ALTERNATIVE # 4--REALIGN SOUTH LEG SR 134 TO EAST

ITEM NO	DESCRIPTION	ESTIMATED QUANTITIES	UNIT	UNIT COST TOTAL	TOTAL COST
Roadway and Buildings					
202	Structure Removal	Lump		\$ 16,000.00	\$ 16,000.00
202	Pavement Removed	1467	S.Y.	\$ 6.00	\$ 8,802.00
202	Guardrail Removed	400	L.F.	\$ 1.00	\$ 400.00
202	Catch Basin Removed	1	EACH	\$ 220.00	\$ 220.00
202	Pipe Removed	80	L.F.	\$ 12.00	\$ 960.00
203	Excavation	1500	C.Y.	\$ 5.00	\$ 7,500.00
203	Embankment	5500	C.Y.	\$ 4.00	\$ 22,000.00
203	Subgrade Compaction	2690	S.Y.	\$ 1.00	\$ 2,690.00
301	Bituminous Aggregate Base	650	C.Y.	\$ 55.00	\$ 35,750.00
304	Aggregate Base	450	C.Y.	\$ 22.00	\$ 9,900.00
448	Asphalt Concrete, Surface Course	90	C.Y.	\$ 70.00	\$ 6,300.00
448	Asphalt Concrete, Intermediate Course	125	C.Y.	\$ 72.00	\$ 9,000.00
408	Bituminous Prime Coat	1076	GAL	\$ 1.00	\$ 1,076.00
601	Rock Channel Protection with Fabric Filter	4	C.Y.	\$ 50.00	\$ 200.00
602	Concrete Masonry	1.72	C.Y.	\$ 620.00	\$ 1,066.40
603	24" Conduit, Type B	200	L.F.	\$ 65.00	\$ 13,000.00
605	Aggregate Drains	15	C.Y.	\$ 7.00	\$ 105.00
870	Seeding and Mulching	3200	S.Y.	\$ 0.50	\$ 1,600.00
877	Erosion Control	Lump		\$ 7,150.00	\$ 7,150.00
619	Field Office	Lump		\$ 4,500.00	\$ 4,500.00
623	Construction Staking	Lump		\$ 4,000.00	\$ 4,000.00
624	Mobilization	Lump		\$ 4,000.00	\$ 4,000.00
	SUBTOTAL				\$ 156,219.40
Traffic Control					
642	Edge Line	1.14	MILE	\$ 1,030.00	\$ 1,170.45
642	Center Line	0.57	MILE	\$ 1,955.00	\$ 1,110.80
642	Stop Line	96.00	L.F.	\$ 5.00	\$ 480.00
202	Raised Pavement Marker Removed for Storage	38	EACH	\$ 5.00	\$ 190.00
621	Raised Pavement Marker Installation Only	38	EACH	\$ 12.00	\$ 456.00
621	Raised Pavement Marker Casting Installation Only	5	EACH	\$ 11.00	\$ 55.00
621	Prismatic Retroreflector	5	EACH	\$ 7.00	\$ 35.00
626	Barrier Reflector, Type A	21	EACH	\$ 6.00	\$ 126.00
630	Sign, Flat Sheet, Type G	222	S.F.	\$ 15.00	\$ 3,330.00
630	Removal of Sign and Disposal, Flat Sheet	44	EACH	\$ 8.00	\$ 352.00
630	Ground-Mounted Support, No. 3	325	L.F.	\$ 6.00	\$ 1,950.00
630	Sign Backing Assembly	2	EACH	\$ 95.00	\$ 190.00
630	Removal of Ground-Mounted Post Support and Disposal	32	EACH	\$ 12.00	\$ 384.00
632	Removal of Intersection Control Beacon, as per Plan	1	EACH	\$ 1,870.00	\$ 1,870.00
632	Vehicular Signal Head, 1-Section, 12 Inch Lens 4-Way	2	EACH	\$ 685.00	\$ 1,370.00
632	Strain Pole, Type TC-81.10M, Design 1	2	EACH	\$ 1,225.00	\$ 2,450.00
632	Strain Pole Foundation	2	EACH	\$ 1,600.00	\$ 3,200.00
632	Flasher Control Unit	1	EACH	\$ 770.00	\$ 770.00
632	Messenger Wire 7 Strand 3/8 Inch	60	L.F.	\$ 6.00	\$ 360.00
632	Signal Cable, 3-Conductor, No. 14 AWG	60	L.F.	\$ 2.00	\$ 120.00
632	Power Service	1	EACH	\$ 975.00	\$ 975.00
632	Power Cable, 2-Conductor, No. 8 AWG	50	L.F.	\$ 2.00	\$ 100.00
632	Conduit Riser, 2 Inch Diameter	20	L.F.	\$ 270.00	\$ 5,400.00
625	Ground Rod	1	EACH	\$ 135.00	\$ 135.00
	SUBTOTAL				\$ 26,579.25

Highway Lighting					
625	Light Pole	2	EACH	\$ 1,340.00	\$ 2,680.00
625	Light Pole Foundation	2	EACH	\$ 1,130.00	\$ 2,260.00
625	Ground Rod	2	EACH	\$ 135.00	\$ 270.00
625	Pull Box, Type 713.08, 18 Inch	3	EACH	\$ 465.00	\$ 1,395.00
625	Trench	150	L.F.	\$ 3.00	\$ 450.00
625	Trench In Paved Areas, Type A	50	L.F.	\$ 25.00	\$ 1,250.00
625	Trench In Paved Areas, Type B	50	L.F.	\$ 20.00	\$ 1,000.00
625	Conduit, 2 Inch, 713.07, Type-II or III	150	L.F.	\$ 5.00	\$ 750.00
625	Transformer Base	2	EACH	\$ 385.00	\$ 770.00
625	No.-10 AWG, Pole and Bracket Cable	100	L.F.	\$ 0.50	\$ 50.00
625	Power Service	1	EACH	\$ 2,255.00	\$ 2,255.00
625	Cable Splicing Kit	4	EACH	\$ 60.00	\$ 240.00
625	1-1/2 Inch Duct-Cable with 3 No. 4 AWG, 5,000-Volt Cables	400	L.F.	\$ 3.00	\$ 1,200.00
625	High Voltage Test	Lump		\$ 1,145.00	\$ 1,145.00
	SUBTOTAL				\$ 15,715.00
MAINTAINING TRAFFIC					
614	Sign, Flat Sheet	300	S.F.	\$ 14.00	\$ 4,200.00
614	Work Zone Marking Sign	10	EACH	\$ 85.00	\$ 850.00
614	Temporary Edge Line, Class 1	1.14	MILE	\$ 670.00	\$ 763.80
614	Temporary Raised Pavement Markers, Type A	40	EACH	\$ 4.00	\$ 160.00
622	Portable Concrete Barrier, 32 Inch, as per Plan	200	L.F.	\$ 12.00	\$ 2,400.00
626	Barrier Reflectors, Type B	8	EACH	\$ 5.00	\$ 40.00
614	Object Markers	8	EACH	\$ 9.00	\$ 72.00
615	Temporary Pavement (pg. 64 Binder), Class A	100	S.Y.	\$ 20.00	\$ 2,000.00
614	Bituminous Concrete for Maintaining Traffic	40	C.Y.	\$ 135.00	\$ 5,400.00
616	Water	20	M.GAL	\$ 20.00	\$ 400.00
616	Calcium Chloride	3	TON	\$ 200.00	\$ 600.00
614	Portable Changeable Message Signs, as per Plan	3	SIGN-MO.	\$ 1,480.00	\$ 4,440.00
614	Replacement Drums	20	EACH	\$ 60.00	\$ 1,200.00
614	Replacement Signs	20	EACH	\$ 10.00	\$ 200.00
614	Removal of Pavement Markings	1000	L.F.	\$ 0.50	\$ 500.00
614	Law Enforcement Officer with Patrol Car	50	HOUR	\$ 35.00	\$ 1,750.00
614	Maintaining Traffic	Lump			\$ 5,000.00
	SUBTOTAL				\$ 29,975.80
Land and Buildings					
	Land and Building Purchase				\$ 30,000.00
	SUBTOTAL				\$ 30,000.00
	15% Contingency				\$ 38,773.42
PROJECT TOTAL					\$ 297,262.87

USR 50 & SR 134

Appendix

TRAFFIC ACCIDENT ANALYSIS

Division No. 09 Report No. _____
 Time Period: From 1-1-97 to 12-31-99
 Location Intersection of U.S. 50 & S.R. 134 (West Intersection) County Highland Page No. 1 of 1

DATE OF ACCIDENT	TIME	LOCATION OF ACCIDENT			WEATHER	ROAD COND.	TYPE OF DAY	VEH.	DRIVERS			COLLISION DIAGRAM	
		LIGHT	K.	INJ.					DIR.	SPEED	COND.		VIOLATIONS
8-12-97	P 12:00	D	0	0	Clear	Dry	Rear End	86 Whit	W	JK 35	N	Following Too Close	
# 1, 68, M, Goshen, OH													
7-20-98	A 11:10	D	0	1	Clear	Dry	Angle	93 Plym	N	C 35	N	Ran Stop Sign	
# 1, 80, F, Fayetteville, OH													
11-13-98	P 1:35	D	0	0	Clear	Dry	Angle	90 Ant	E	S 35	N	None	
# 2, 54, F, Fayetteville, OH													
								94 Ford	N	SUV 10	N	Failure To Yield	

DIRECTIONAL ANALYSIS

Motor vehicle movement before accident: _____
 Vehicle movement after accident: _____
 Pedestrian movement: _____
 Sliding vehicle: _____
 Vehicle overturning: _____
 Vehicle out of control: _____

LEGEND

Sideswipe:
 Head-on collision:
 Rear-end collision:
 Vehicle struck fixed object:
 Parked vehicle:

CONDITION OF DRIVER

N - Normal
 D - Drunk
 I - Intoxicated
 A - Asleep or Fatigued
 PD - Physical defect



INDICATE NORTH

COLLISION DIAGRAM

← TUE-8-12-97-12:00P-DRY-DAY

↑ FRI-11-13-98-1:30P-DRY-DAY

↑ MON-7-20-98-11:00A-DRY-DAY

U.S. 50
(RD. NAME)

ACC SUMMARY

PD	2
INJ	1
TOTAL	<u>3</u>

S.R. 134
(RD. NAME)

SYMBOLS

- ← MOVING VEHICLE
- ← → → → BACKING VEHICLE
- △ --- NON-INVOLVED VEHICLE
- ⋈ --- PEDESTRIAN
- ▣ PARKED VEHICLE
- FIXED OBJECT
- FATAL ACCIDENT
- INJURY ACCIDENT

TYPES OF COLLISIONS

- ← | ← REAR END
- | △ HEAD ON
- ← | △ SIDE SWIPE
- ← | ○ ○ ○ OUT OF CONTROL
- ← | △ LEFT TURN
- ← | △ RIGHT ANGLE

SHOW FOR EACH
ACCIDENT

1. DAY, DATE, AND TIME
2. WEATHER AND ROAD SURFACE - IF UNUSUAL CONDITION EXISTED
3. NITE - IF BETWEEN DUSK AND DAWN

INTERSECTION High U.S. 50 AND S.R. 134
 PERIOD 3 Years : FROM 1-1-97 TO 12-31-99

TRAFFIC ACCIDENT ANALYSIS

Division No. 09

Time Period: From 1-1-97 to 12-31-99

Report No. _____

Location: Intersection of U.S. 50 & S.R. 134 (East Intersection) County: Highland

Page No. 1 of 1

LOCATION OF ACCIDENT				WEATHER	ROAD COND.	TYPE OF DAY	VEH.	DRIVERS				COLLISION DIAGRAM	
DATE OF ACCIDENT	TIME	LIGHT	K. INJ.					DIR.	SPEED	COND.	VIOLATIONS		
2-22-97	8:00 P	N 00	00	Clear	Dry	Angle	89 Toyota	1	S	C 30	N	Failure To Yield	<p style="text-align: center;">S.R. 134 U.S. 50</p>
#1, 33, F						Sat	86 Chev	2	W	C 30	N	None	
								3					
								1					
								2					
								3					
								1					
								2					
								3					
								1					
								2					
								3					
								1					
								2					
								3					

LEGEND

DIRECTIONAL ANALYSIS

Motor vehicle movement before accident: _____

Motor vehicle movement after accident: _____

Pedestrian movement: _____

Sliding vehicle: _____

Vehicle overturning: _____

CONDITION OF DRIVER

N - Normal

D - Drinking

I - Intoxicated

A - Asleep or Fatigued

PD - Physical defect



INDICATE NORTH

SAT-2-22-97-8:00P-DRY-NITE

S.R. 134

COLLISION
DIAGRAM



U.S. 50

ACC SUMMARY

PD	1
INJ	0
TOTAL	1

SYMBOLS

- MOVING VEHICLE
- BACKING VEHICLE
- NON-INVOLVED VEHICLE
- PEDESTRIAN
- PARKED VEHICLE
- FIXED OBJECT
- FATAL ACCIDENT
- INJURY ACCIDENT

TYPES OF COLLISIONS

- REAR END
- HEAD ON
- SIDE SWIPE
- OUT OF CONTROL
- LEFT TURN
- RIGHT ANGLE

SHOW FOR EACH
ACCIDENT

1. DAY, DATE, AND TIME
2. WEATHER AND ROAD SURFACE - IF UNUSUAL CONDITION EXISTED
3. NITE - IF BETWEEN DUSK AND DAWN

INTERSECTION Hig U.S. 50 AND S.R. 134
 PERIOD 3 Years : FROM 1-1-97 TO 12-31-99

SPEED CHECK HAND HELD RADAR GUN

LOCATION: I-75-50-2.85 @ SR 134
DATE: 03/06/2000 **DAY:** MONDAY **COUNTY:** HIGHLAND
OBSERVER: R. CHAFFIN, G. BAIRD - ODOT DISTRICT NINE
TYPE PAVEMENT: ASPHALT **DRY:** X **WET:** **CONDITION:** GOOD **WIDTH:** 22 FT.
WEATHER: CLEAR & SUNNY **TEMPERATURE:** 65° F

WEST BOUND. TIME 1:00 P.M., TO 2:00 P.M.					M.P.H.	EAST BOUND. TIME 1:00 P.M., TO 2:00 P.M.				
CUM. %	CUM. TOTAL	NO.	VEHICLES			VEHICLES		NO.	CUM. TOTAL	CUM. %
			PASSENGER CARS	COMMERCIAL		PASSENGER CARS	COMMERCIAL			
					OVER					
					90					
					88					
					86					
					84					
					82					
					80					
					78					
					76					
					74					
					72					
					70					
					68					
					66					
					64					
					62					
100	80	1	1		60					
					58	1		1	74	100
99	79	4	3	1	56	1	1	2	73	99
94	75	2	2		54	3		3	71	96
91	73	5	5		52	1		1	68	92
85	68	11	7	4	50	5	2	7	57	91
71	57	13	13		48	7	1	8	60	81
55	44	18	15	3	46	8	2	10	52	70
33	26	8	6	2	44	10	4	14	42	57
23	18	7	6	1	42	13	2	15	28	38
14	11	8	7	1	40	11		11	13	18
					38					
4	3	1	1		36	2		2	2	3
3	2	1	1		34					
					32					
1	1	1		1	30					
					28					
					26					
					24					
					22					
					20					
					18					
					16					
					14					
					BELOW					
		80	67	13	TOTALS	62	12	74		

Intersection: USR-50 and SR 134
 No. of lanes per approach: North: 1 East: 1 Located in: City: _____
 South: 1 West: 1 Village/DODS: _____
 Presently Signalized? Yes X No _____ Rural: X
 Maintaining Agency: ODOT-DISTRICT 9

Calc. By: MARION WORLEY County: HIGHLAND
 Ckd. By: JOHN STICKNEY Route: USR-50
 Consultant: WOOLPERT, LLP Section: 2.80

Warrant #9 (Four Hour Volumes) _____ See Attached
Warrant #10 (Peak Hour Delay) _____ No _____
Warrant #11 (Peak Hour Volume) _____ See Attached

Warrant #4 (School Crossing)-NOT APPLICABLE
 On approved school route? _____ YES _____ NO _____
 Gap analysis made during period from _____ to _____
 Number of vehicles during analysis period: _____
 Pedestrian crossing time (t): _____ sec
 Number of gaps greater than (t) during period: _____
 Approximate vehicular speed: _____ MPH
 Number of children crossing during period: _____
 Warrant Satisfied? _____ YES _____ NO _____

Warrant #5 (Progressive Movement)-NOT APPLICABLE
 Major streets: _____
 Dist. to nearest signal in each direction on major street: _____ 1-Way _____ and _____ 2-Way
 Time space diagram (attached) shows that this location can be implemented into a system: _____ YES _____ NO _____
 Warrant Satisfied? _____ YES _____ NO _____

Warrant #6 (Accident Hazard)-NOT APPLICABLE
 Adequate trial of less restrictive measures: _____ YES _____ NO _____
 Number of accidents per year of a type which could be prevented by signalization: _____
 80% of warrant #1 or Warrant #2 satisfied: _____ YES _____ NO _____
 Will signalization disrupt progressive movement? _____ YES _____ NO _____
 Warrant Satisfied? _____ YES _____ NO _____

Warrant #7 (Systems)-NOT APPLICABLE
 Both streets are considered major routes: _____ YES _____ NO _____
 At least 800 V.P.H. during weekday peak hour: _____ YES _____ NO _____
 At least 800 V.P.H. for any 5 hours on a Saturday or Sunday: _____ YES _____ NO _____
 Warrant Satisfied? _____ YES _____ NO _____

Warrant #8 (COMBINATION)
 Warrants numbered _____ 1 and _____ 2
 are each met at the 80% level: _____ YES _____ NO _____
 X

Additional Items Attached
 Gap Analysis: _____ NO _____ YES _____
 Speed Data: _____ NO _____ YES _____
 Delay Analysis: _____ NO _____ YES _____
 Time/Space Diagram: _____ NO _____ YES _____
 Ground Photographs: _____ YES _____
 Aerial Photographs: _____ NO _____ YES _____
 Documentation/Explanation: _____ NO _____ YES _____
 Other (Describe): _____
 INTERSECTION STUDY
 SEASONAL FACTOR .97

Condition	Adjusted Hourly Volumes		Warrant #1			Warrant #2			Warrant #3					
	No. Lane	Minor 1-Way	100% Maj.	80% Maj.	100% Min.	80% Maj.	100% Min.	80% Maj.	100% Min.	80% Ped.				
Norm*	1		500	400	120	750	75	600	60	600	150	480	120	
70%*	1	X	350	105	280	84	525	53	420	42	420	105	336	84
Mid - 1 am	2+		420	140	336	112	630	70	504	56				
1 am - 2 am														
2														
3														
4														
5														
6														
7														
8		269		N	N	Y	N	Y	N	Y	N	N	Y	
9		256		N	N	N	N	Y	N	Y	N	N	N	
10														
11														
Noon - 1 pm														
1 pm - 2 pm		267		N	N	N	N	N	N	N	N	N	N	
2		313		N	N	Y	N	N	N	N	N	N	N	
3		320		N	N	Y	N	N	N	N	N	N	N	
4		314		N	N	Y	N	N	N	N	N	N	N	
5		357		Y	N	Y	N	N	N	Y	N	Y	N	
6		411		Y	N	Y	N	Y	N	Y	N	Y	N	
7														
8														
9														
10														
11														
Hours Met			2	0	5	1	0	2	0	4	0	0	2	1

Warrant Satisfied? _____ NO _____
 * CONDITION IS DETERMINED BY ENVIRONMENT: Use 70% values if 85th percentile speed exceeds 40 mph on the major approach or if location is in the built-up area of an isolated community with a population of less than 10,000

Ohio Department of Transportation

District 9 - Planning

650 Eastern Ave, Chillicothe, Ohio 45601

1-888-819-8501

Weather: Dry 60's

Counted by: Walt West

Board #: D4-1489

Data: Station # 10636

Study Name: H50-134A

Site Code : 00000000

Start Date: 10/13/99

Page : 1

Vehicle group 1, Vehicle group 2, Vehicle group 3

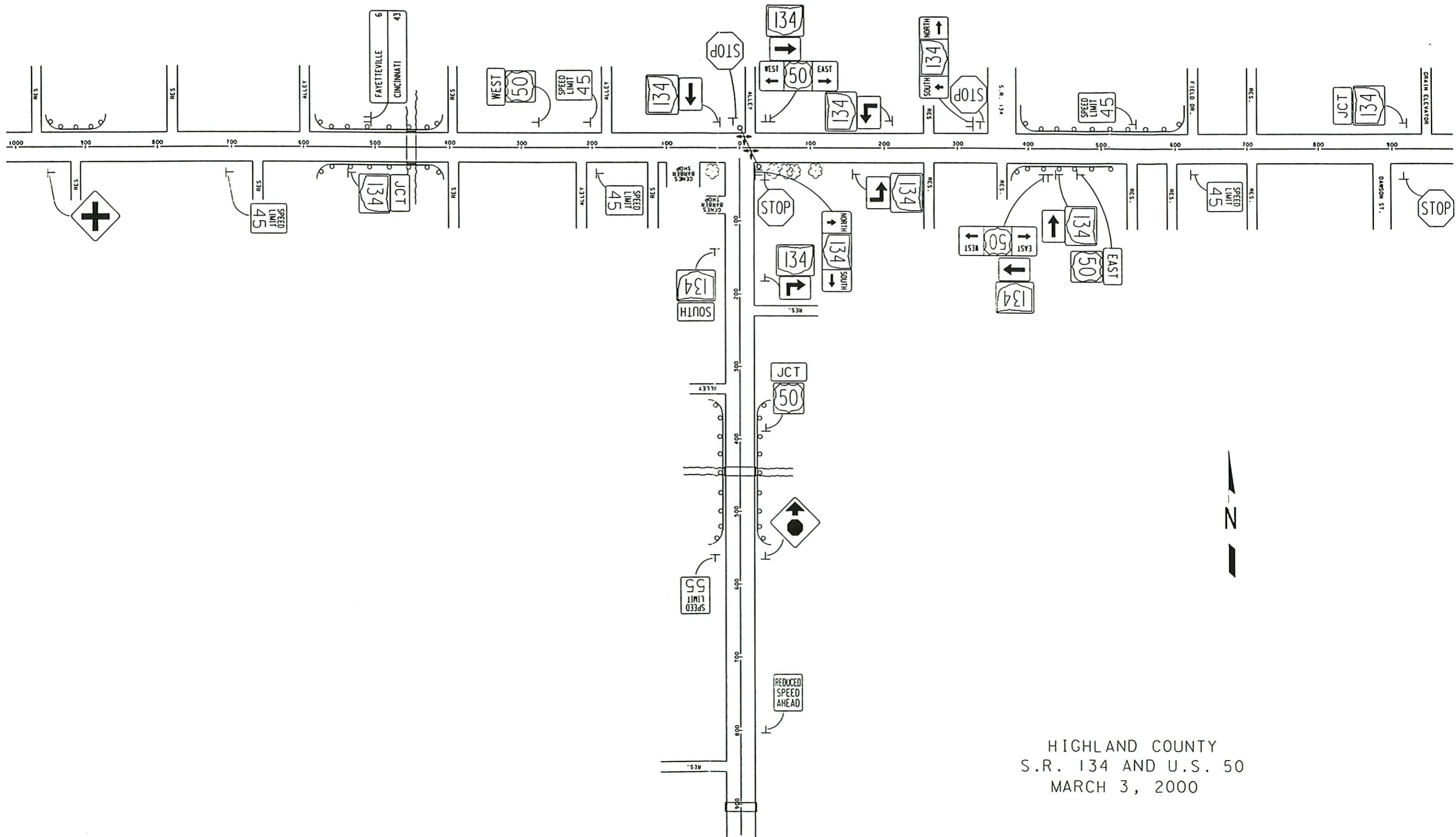
Start Time	SR 134 SB Southbound				US 50 WB Westbound				SR 134 NB Northbound				US 50 EB Eastbound				Ped	Intvl.	Total
	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped			
10/13/99																			
06:00	0	0	0	0	5	46	1	0	3	0	8	0	0	7	0	0	0		70
06:15	0	0	0	0	3	47	0	0	0	0	11	0	0	7	1	0	0		69
06:30	0	0	0	0	2	43	0	0	1	0	6	0	0	20	0	0	0		72
06:45	0	0	0	0	8	33	0	0	3	0	10	0	0	19	1	0	0		74
Hour	0	0	0	0	18	169	243	1	7	0	42	35	0	53	2	0	0		285
07:00	0	0	0	0	5	33	0	0	3	0	16	0	0	19	0	0	0		76
07:15	0	0	0	0	8	41	0	0	6	0	42	0	0	21	1	0	0		119
07:30	0	0	0	0	13	34	0	0	2	0	12	0	0	31	4	0	0		96
07:45	0	0	0	0	7	33	0	0	2	0	5	0	0	24	3	0	0		74
Hour	0	0	0	0	33	141	277	0	13	0	88	75	0	95	8	0	0		365
08:00	0	0	0	0	4	22	0	0	2	0	12	0	0	33	1	0	0		74
08:15	0	0	0	0	14	30	0	0	4	0	5	0	1	28	4	0	0		86
08:30	0	0	0	0	3	35	0	0	2	0	8	0	0	26	3	0	0		77
08:45	0	0	0	0	7	31	0	0	1	0	14	0	0	22	0	0	0		75
Hour	0	0	0	0	28	118	264	0	9	0	48	39	0	109	8	0	0		312
09:00	0	0	0	0	9	30	0	0	0	0	11	0	0	36	2	0	0		88
09:15	0	0	0	0	8	35	0	0	0	0	7	0	0	31	3	0	0		84
09:30	0	0	0	0	3	25	0	0	3	0	8	0	0	27	4	0	0		70
09:45	0	0	0	0	4	28	0	0	1	0	3	0	0	28	1	0	0		65
Hour	0	0	0	0	24	118	274	0	4	0	33	29	0	122	10	0	0		307
10:00	0	0	0	0	5	30	0	0	2	0	9	0	0	39	1	0	0		86
10:15	0	0	0	0	5	26	0	0	3	0	9	0	1	26	0	0	0		70
10:30	0	0	1	0	3	22	0	0	4	0	6	0	0	28	4	0	0		68
10:45	0	1	0	0	9	26	0	0	2	0	7	0	0	29	2	0	0		76
Hour	0	1	1	0	22	104	256	0	11	0	42	31	0	122	7	0	0		300
11:00	0	0	0	0	5	21	0	0	3	0	8	0	0	23	3	0	0		63
11:15	0	0	1	0	3	32	0	0	3	0	9	0	0	36	2	0	0		86
11:30	0	0	0	0	10	31	0	0	1	0	4	0	0	39	5	0	0		90
11:45	0	0	0	0	3	28	0	0	4	0	3	0	0	28	0	0	0		66
Hour	0	0	1	0	21	112	269	0	11	0	35	24	0	126	10	0	0		305
Total	0	1	2	0	146	762	1	0	55	0	233	0	2	627	45	0	0		1874
Apr.	-	33.3	66.6	-	16.0	83.8	0.1	-	19.0	-	80.9	-	0.2	93.0	6.6	-	-		-
Int.	-	-	0.1	-	7.7	40.6	-	-	2.9	-	12.4	-	0.1	33.4	2.4	-	-		-

Weather: Dry 44 deg
 Counted by: Walt West
 Board #:D4-1489
 Data: Station 10636

Ohio Department of Transportation
 Distric 9 - Planning
 650 Eastern Ave, Chillicothe, Ohio 45601
 1-888-819-8501

Study Name: H50-134B
 Site Code : 00010636
 Start Date: 11/03/99
 Page : 1

Start Time	Vehicle group 1, Vehicle group 2, Vehicle group 3			Vehicle group 1, Vehicle group 2, Vehicle group 3			Vehicle group 1, Vehicle group 2, Vehicle group 3			Vehicle group 1, Vehicle group 2, Vehicle group 3			Vehicle group 1, Vehicle group 2, Vehicle group 3			Ped	Intvl.	Total			
	SR 134 SB Southbound			US 50 WB Westbound			SR 134 NB Northbound			US 50 EB Eastbound			SR 134 NB Northbound						US 50 EB Eastbound		
	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right				Ped	Left	Thru
11/03/99																					
13:00	0	0	0	0	8	37	0	0	3	0	8	0	0	42	2	0					100
13:15	0	0	0	0	5	36	1	0	0	0	13	0	0	26	2	0					83
13:30	0	0	0	0	5	27	0	0	1	0	8	0	0	28	1	0					70
13:45	0	0	0	0	7	27	0	0	2	0	4	0	0	20	1	0					61
Hour	0	0	0	0	25	127	275	1 ✓	6	0	39	33	0	116	6	0					314
14:00	0	0	0	0	8	43	0	0	3	0	4	0	0	34	1	0					93
14:15	0	0	0	0	8	34	0	0	2	0	6	0	0	35	1	0					86
14:30	0	0	0	0	7	42	0	0	3	0	10	0	0	32	0	0					94
14:45	0	0	0	0	6	38	0	0	1	0	7	0	0	30	4	0					86
Hour	0	0	0	0	29	157	323	0 ✓	9	0	36	27	0	131	6	0					359
15:00	0	0	0	0	4	35	1	0	2	0	7	0	0	40	1	0					90
15:15	0	0	0	0	9	33	0	0	3	0	6	0	0	26	1	0					78
15:30	0	1	1	0	20	29	0	0	3	0	3	0	0	33	4	0					94
15:45	0	0	0	0	18	43	0	0	1	0	5	0	0	31	2	0					100
Hour	0	1	1	0	51	140	330	1 ✓	9	0	30	21	0	130	8	0					362
16:00	1	0	0	0	9	32	0	0	3	0	7	0	0	33	2	0					87
16:15	0	0	0	0	9	29	0	0	2	1	8	0	0	38	2	0					89
16:30	0	0	0	0	12	43	1	0	2	0	8	0	0	38	4	0					108
16:45	0	0	0	0	7	34	0	0	2	0	7	0	0	27	4	0					81
Hour	1	0	0	0	37	138	324	1 ✓	9	1	40	30	0	136	12	0					365
17:00	0	0	1	0	10	34	0	0	2	0	8	0	0	48	3	0					106
17:15	0	0	1	0	10	31	0	0	1	0	10	0	0	35	5	0					93
17:30	1	0	0	0	24	28	0	0	3	0	5	0	0	41	2	0					104
17:45	0	0	0	0	8	40	0	0	0	0	15	0	0	45	4	0					112
Hour	1	0	2	0	52	133	368	0 ✓	6	0	44	38	0	169	14	0					415
18:00	0	0	0	0	16	37	0	0	1	0	18	0	0	48	4	0					124
18:15	0	0	0	0	18	38	0	0	1	0	14	0	0	54	5	0					130
18:30	0	0	0	0	10	36	1	0	4	0	13	0	0	55	4	0					123
18:45	0	0	0	0	11	33	0	0	0	0	14	0	0	52	2	0					112
Hour	0	0	0	0	55	144	424	1 ✓	6	0	65	59	0	209	15	0					489
Total	2	1	3	0	249	839	4	0	45	1	208	0	0	891	61	0					2304
‡ Apr.	33.3	16.6	50.0	-	22.8	76.8	0.3	-	17.7	0.3	81.8	-	-	93.5	6.4	-					-
‡ Int.	-	-	0.1	-	10.8	36.4	0.1	-	1.9	-	9.0	-	-	38.6	2.6	-					-



HIGHLAND COUNTY
 S.R. 134 AND U.S. 50
 MARCH 3, 2000