

October 18, 2011

SYP Numbers:

R-\$130,000

U-\$50,000

C-\$530,000



# DNA: Data Needs Analysis

Leslie County US 421 Land Slide Repair Item Number 11-5010.00

Kentucky Transportation Cabinet

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## I. INTRODUCTION

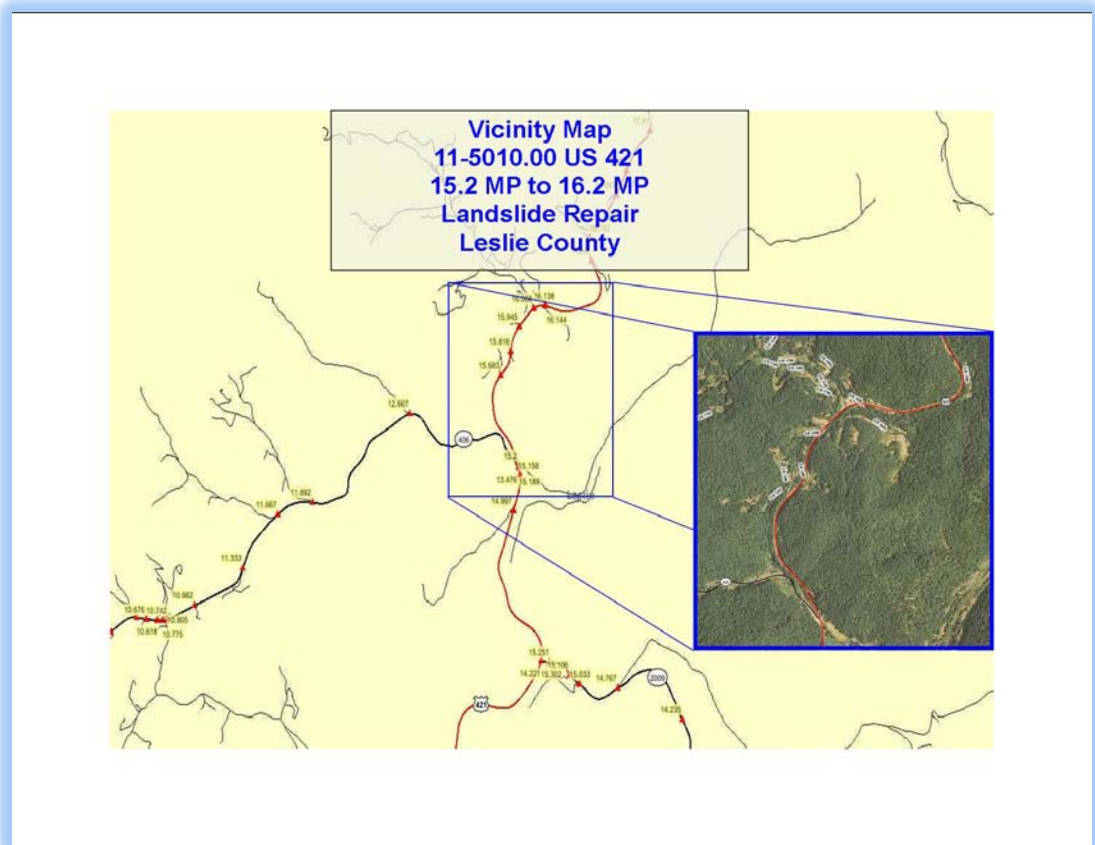
This study is a Data Needs Analysis (DNA) of a land slide area near Stinnett on US 421 around 15.25 mile point (MP) to about 16.2 MP in Leslie County, Item Number 11-5010.00.

### A. Study Purpose

The purpose of the DNA is to address the nine elements of Purpose and Need as defined by NEPA in order to develop a draft Purpose and Need Statement for the project. This study will also provide a more defined project scope, possible alternatives, planning-level cost estimates for the alternatives, an identification of potential environmental impacts, and other information that will be of assistance in the Project Development Phase of this project.

### B. Location

This project is located on US 421 north of KY 406 near Stinnett Creek with project limits extending from south of the intersection of KY 406 (MP 15.22) extending north for about a mile along US 421 in Leslie County (See **Figure 1** in **Appendix A**). The project includes an area known for repetitive landslides causing safety issues. A topographic map of the study area, Exhibit 2, can also be viewed in **Appendix A**.



**Figure 1: Vicinity Location Map**

## **II. PROJECT PURPOSE AND NEED**

### **A. Legislation**

This project was entered into the Six-Year Highway Plan (SYP) in 2008. The design phase funding of \$575,000 (SPP funds) was authorized in September 2011. Additional funds were requested since the SYP funds did not have sufficient funds for the design phase; an additional \$445,000 was requested and authorized. The following is a description of the project as it is listed in the 2010 General Assembly's Enacted Roadway Plan.



- **Item #11-5010.00, Leslie County**

| <u>Phase</u> | <u>Fund</u> | <u>Year</u> | <u>Estimate</u> |
|--------------|-------------|-------------|-----------------|
| D:           | SPP         | 2011        | \$575,000       |
| R:           | SPP         | 2011        | \$130,000       |
| U:           | SPP         | 2011        | \$50,000        |
| C:           | SPP         | 2012        | \$530,000       |

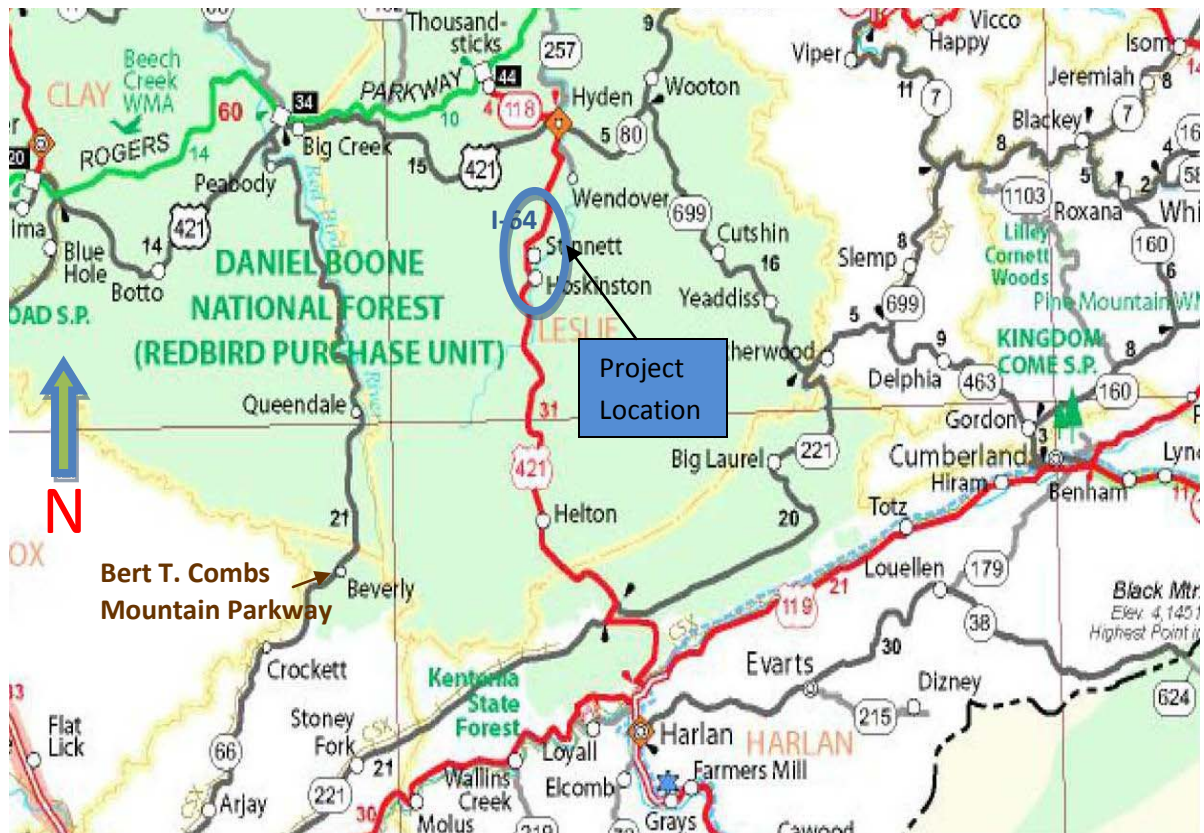
LANDSLIDE REPAIR ON US 421 FROM 0.2 MILE SOUTH JCT KY-406 AT STINNETT  
NORTH 1.0 MILE (2002BOPC) (10CCCR).

**B. Project Status**

Design funds for this project were authorized in 2011. Preliminary Design Plans are expected to be complete in 2012 for alternatives with the roadway shifting to the cut and fill sides of the existing location. All of the proposed alignments can be viewed in **Appendix A**. Final Design Plans are expected to be completed in 2013 for the chosen alternative. The existing geometry may be utilized as a diversion for each alternate via lane closures. There are currently no studies for this location to aid in the selection of an alternate.

**C. System Linkage**

The US 421 corridor is a major two-lane connection between US 119 and the Hal Rogers Parkway. KY 406 is a minor collector road that connects several small rural communities.



**Figure 2: System Linkage Map**

This segment of US 421 has the following roadway classifications:

- **Functional Classification** – Rural Minor Arterial
- **State System** – State Primary
- Not on the National Truck Network
- **Truck Weight Classification** – AAA
- Not on the Appalachian Development Highway System
- Not a designated Bike Route
- Limited Access Facility

#### **D. Modal Interrelationships**

There is no public transit on this route. The closest active rail line is several miles northeast of the project site in Hazard, KY. US 421 is mostly used for communities travelling in and out of the area with some coal hauled, however, it's not on the National Truck Network.

#### **E. Social Demands & Economic Development**

The communities in this area utilize the US 421 corridor as a means to travel to businesses. US 421 connects major developments between the southern and northern areas of Leslie County. It also provides connections to the Hal Rogers Parkway which gives further access to developed areas east or west of this location.

#### **F. Transportation Demand**

A traffic forecast was recently completed for this project and can be viewed in detail in **Appendix B. Table 1** summarizes the information provided. The section MP 14.9 is just south of the project location. The growth factor used for determining the forecasted year is 2.0% via the exponential growth analyses performed on the historical data from nearby stations. An annual growth of 1.0% is used to determine the forecasted truck traffic given the area also experiences occasional coal traffic.

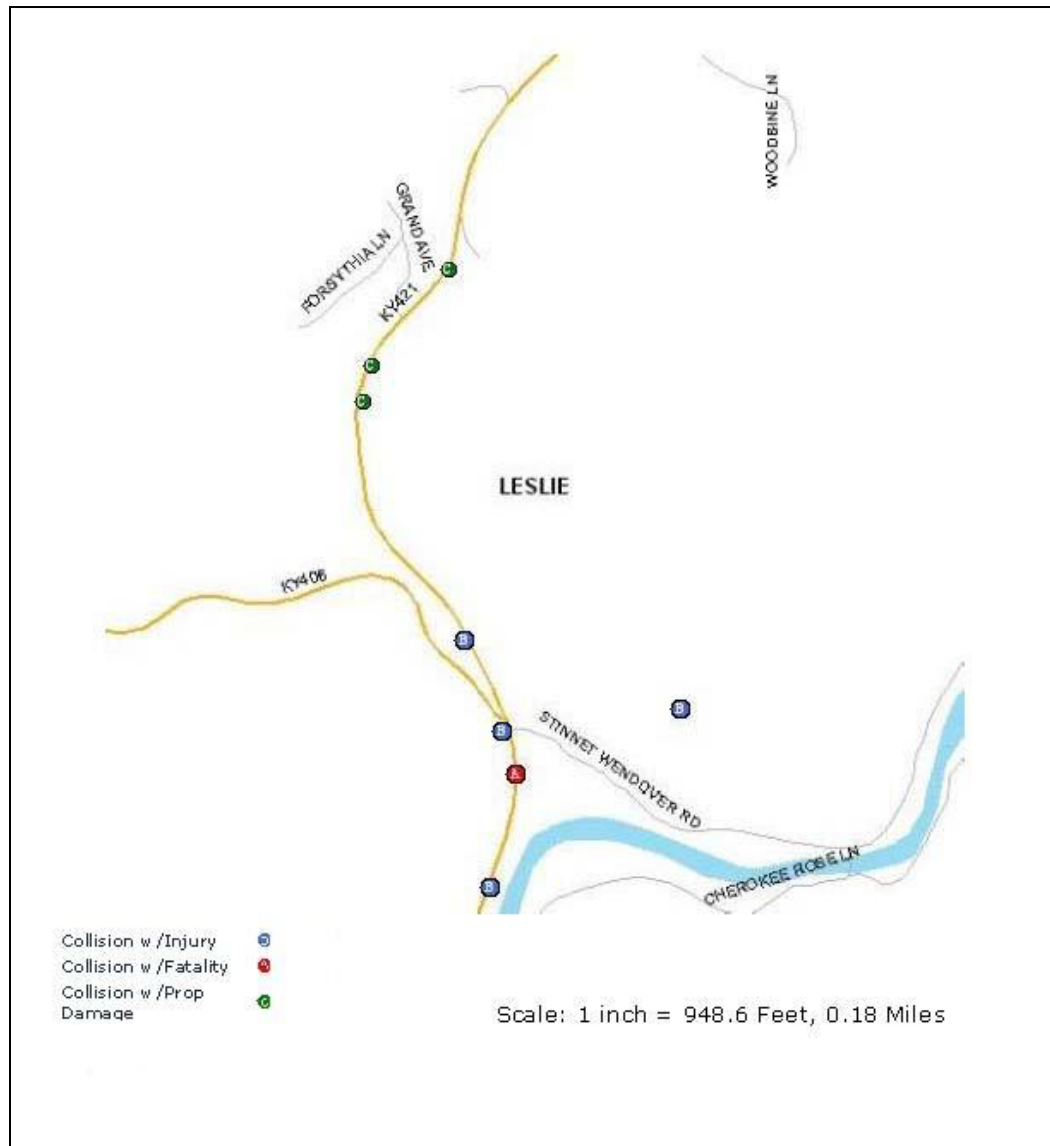
**Table 1: Traffic Forecast**

|                    | <b>MP 14.9</b> |
|--------------------|----------------|
| <b>2011 ADT</b>    | 3,000          |
| <b>2035 ADT</b>    | 4,800          |
| <b>2035 DHV</b>    | 600            |
| <b>2011 Truck%</b> | 10.0%          |
| <b>2035 Truck%</b> | 13.0%          |
| <b>20 YR ESALS</b> | 2,000,000      |

#### **G. Safety**

Collision data was obtained from the Kentucky State Police database for a three year period from January 1, 2008 to June 15, 2011. There were no Crash Rate Factor (CRF) issues for this specific area of US 421 in Leslie County. There were 9 reported collisions in the project area during this period. No night/day pattern could be determined. A weather pattern of wet or slick roads was found, likely due to the steep grades in this area. There was 1 fatality that occurred on this segment of US 421 during the three year analysis period near the project location. Site visit concludes the possible reasons were

the steep grades and possible poor sight distance is contributing to some of the collisions. More detailed information on crash data in **Appendix C**.



**Figure 3: Collision Locations**

## H. Roadway Deficiencies

### a. Mainline Geometrics

The roadway currently has 10-ft lanes, 2-ft shoulders, a maximum grade of 8.4%, a posted speed limit of 55 MPH. KYTC's Common Geometric Practices for Rural Arterials recommends 12-ft lanes and 8-ft shoulders for a 55 MPH Design Speed and a maximum grade of 6% for mountainous terrain (see **Appendix D**). The roadway



currently does not meet these recommendations for the pavement width, shoulder width, nor the maximum grade. The curve at the end of the project has a minimum radius of 954.9 feet which is slightly less than the recommended radius of 1065 feet in the KYTC's Common Geometric Practices for Rural Arterials. Some of these geometric deficiencies will be addressed by an adjacent project (Item Number 11-1078.00) and will not be considered in the alternatives of this report. Existing roadway plans can be viewed in **Appendix E**.



***Figure 4: Horizontal and Vertical Curve north going up the hill***

b. Bridges/Culverts

There is one culvert located in the project area. The culvert is a 12'x12' double box barrel concrete culvert. The protection above the culvert is currently standard guardrail. The culvert is rated with a Sufficiency Rating (SR) of 31.5 meaning that the structure has been declared structurally deficient. The culvert over Stinnett Creek is not currently wide enough (21.0-ft curb to curb) to accommodate the

recommended 8-ft shoulders. There are also several maintenance issues with debris that collects at the wall separating the barrels of the culvert. Also, scouring was noted at the inlet of the culvert creating a need for additional maintenance. The culvert over Stinnett Creek can be seen in **Figure 5** below. It shall be noted that this structure is part of an adjacent project (Item Number 11-1078.00) even though the project limits of 11-5010.00 encompass the existing structure and that consideration for the design of replacing said structure will not be inclusive to the alternatives in this report.



**Figure 5: Culvert over Stinnett Creek**

c. Intersections

Due to the crash history on the US 421 intersection with KY 406, the adequacy of the geometrics in this area was analyzed. There is a horizontal curve located at the intersection of KY 406. The stopping sight distance was calculated from roadway plans to be 276 feet which meets a 35 MPH Design Criteria. The road is currently signed at 55 MPH. Below, in **Figure 6 and Figure 7**, are pictures taken near the horizontal curve. However, this intersection is being evaluated by an adjacent project (Item Number 11-1078.00) and will not be addressed in any of the alternatives for evaluation in this report.





**Figure 6: KY 406 looking north**



**Figure 7: US 421 Near Top of Grade**

d. Drainage

Flooding does not appear to be a major issue in this area. The Flood Insurance Rate Maps (FIRMs) does indicate a flood zone along the corridor of KY 406, however, this is not in the project area. The drainage issues of the culvert south of the intersection with KY 406 are being addressed by another Six Year Highway Plan (SYP) Project Item Number 11-1078.00. The elevation of the roadway in this area generally stays above the Base Flood Elevation. The FIRM Maps of the project site can be viewed in **Appendix F**.

**III. PRELIMINARY ENVIRONMENTAL OVERVIEW**

**A. Ecological Overview, Threatened and Endangered Species**

This project will involve landslide repair along part of Stinnett Creek and an unnamed tributary to Stinnett Creek. Both are upstream to a KDOW listed Special Use Water (Middle Fork Kentucky River) in Leslie County, Kentucky. The USGS Quadrangle is Hoskinston. There are no recognized bat polygons in the area. Caution needs to be taken to ensure all waste generated at the site is placed in a designated site that is not in the floodplain and that Best Management Practice's (BMP's) are developed to adequately control erosion and run-off. There appear to be no ponds impacted. USFWS has identified suitable habitat for threatened and endangered species in the project area. Current species listed for Leslie County are *Myotis sodalis*, Indiana bat. Future study will address the requirements of USFWS and prevent detriment to the protected species. Land use impacts should be temporary and should not significantly change the current use.

**B. Socioeconomic/Environmental Justice**

With possible relocations, there would appear to be environmental justice issues associated with this project. However, the construction should not pose hardships to a community provided that the road is not closed as part of the project. Similarly, there appears to be no impacts to prime farmland.

**C. Cultural/Historic Resources**

There appears to be no older structures taken. However, taking into account that the area is at least partially prior disturbed by existing road construction, a phase I archaeological survey will determine cultural significance and if eligible sites are located in the project footprint.



#### **D. Potential UST/HazMat, Air, and Noise**

There is no evidence to support UST/Hazmat issues on this project. No asbestos containing materials were discovered during inspection. However, the requirement for an advanced notification prior to demolition and removal of the bridge is necessary due to noise concerns. Noise issues will be temporary and limited to those associated with construction activity. Possible new lanes with no large increase in the traffic patterns will be associated with this project. Air Quality will be controlled with good construction practices. The project area is listed as in attainment for monitored air pollutants.

#### **IV. PRELIMINARY PROJECT INFORMATION**

##### **A. Existing Conditions/Roadway Data**

A summary of the existing conditions can be seen in **Table 2**. The segment of the roadway within the project limits has 10-ft lanes, 2-ft shoulders, and vertical curves with grades of approximately 6.5% to 8.4%. Other existing roadway information can be viewed in the roadway plans for US 421 in **Appendix E**. Additional pictures of the project site can be viewed in **Appendix G**.

**Table 2: Existing Conditions and Data Summary**

|                  |                                  |                 |                   |
|------------------|----------------------------------|-----------------|-------------------|
| County:          | <u>Leslie</u>                    | Road Name:      |                   |
| Route Number(s): | <u>US 421</u>                    |                 |                   |
| Item No.:        | <u>11-5010.00</u>                |                 |                   |
| BMP:             | <u>15.1</u>                      | EMP:            | <u>16.2</u>       |
| Project Length:  | <u>1.1 miles</u>                 |                 |                   |
| Rdwy. Class.:    | <u>Rural Minor Arterial</u>      | State Class.:   | <u>Primary</u>    |
| Truck Class:     | <u>AAA</u>                       |                 |                   |
| ADT (current):   | <u>3,000 to 4,400</u>            |                 |                   |
| Terrain:         | <u>Mountainous</u>               | Access Control: | <u>Controlled</u> |
| Posted Speed:    | <u>55 MPH</u>                    | Median Type:    | <u>Undivided</u>  |
| Funding Type:    | <u>D-SPP, R&amp;U-SPP, C-SPP</u> |                 |                   |

**Roadway Data:**

|                 | <u>Existing Conditions</u> | <u>Design Criteria*</u>      |
|-----------------|----------------------------|------------------------------|
| No. of Lanes    | 2                          | 2                            |
| Lane Width      | 10 ft                      | 12 ft                        |
| Shoulder Width  | 2 ft                       | 8 ft                         |
| Minimum Radius  | 954.9 ft                   | 1065 ft                      |
| Maximum Grade   | 6.5-8.4%                   | 6%                           |
|                 |                            | <i>* 55 MPH Design Speed</i> |
| Adequacy Rating |                            |                              |
| %:              | 30-45                      |                              |

**Bridge Data:**

|                     |                     |
|---------------------|---------------------|
|                     | <u>066B00008N*</u>  |
| Max. Span Length    | 12.0 ft (2 barrels) |
| Length              | 92.0 ft             |
| Width, out to out   | 36.0 ft             |
| Width, curb to curb | 21.0 ft             |
| Sufficiency Rating  | 31.5                |

\*This bridge shall NOT be considered as part of the design for this project as it will be covered in Item Number 11-1078.00 which is adjacent to the current project location.

## **B. Utilities**

A list of utilities that may be encountered in the project area:

Electric  
Telephone  
Cable  
Water  
Gas

This information was obtained from field inspection, existing roadway plans, and a GIS database. The location of utilities as well as the utility contacts will need to be verified as the project survey is completed in Phase I Design.

## **V. PROJECT PURPOSE AND NEED STATEMENT**

A Purpose and Need Statement is the foundation for project decision-making and is needed for projects requiring National Environmental Policy Act (NEPA) documentation. Based upon the information presented in Section II of this report and discussion with the project team, the following Purpose and Need Statement was drafted for this project:

This project is necessary due to the safety issues deriving from the recurring landslides along the US 421 Corridor between MP 15.2 and 16.2 in Leslie County. The current Average Daily Traffic is 3,000 and the geometric deficiencies of two traffic lanes of 10ft in width with the 2ft shoulders make it difficult for vehicles to maneuver along the pavement as it tends to slide. The geometrics of the roadway throughout the project location includes steep grades between 6.5% to 8.4%, as well as horizontal curve, that do not give adequate sight distance, making it difficult to avoid pavement breaks. These landslides also create pavement breaks which cause the vehicles coming down steep grades to have a vertical drop of several inches that is extremely hazardous during inclement weather. Continuing maintenance for this stretch of road could be alleviated from having to repeatedly patch and reinforce the roadside with various means. **This project will improve the safety and geometrics in this community by providing better geometrics for this section of roadway.**

## **VI. POSSIBLE ALTERNATIVES**

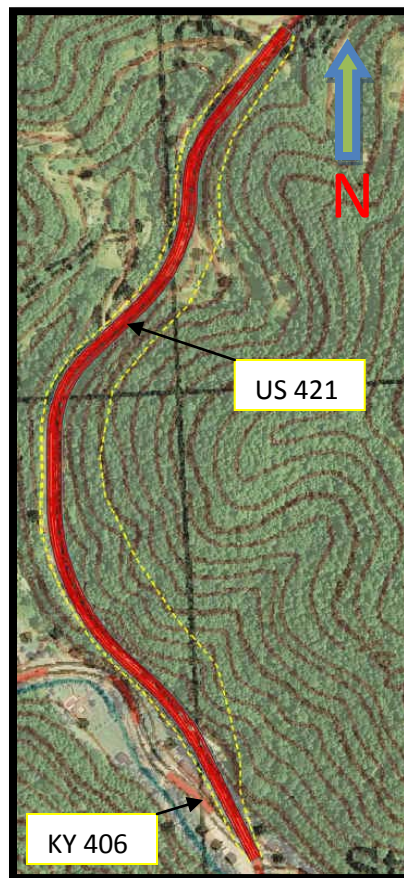
The following are several of the alternatives analyzed and discussed during the development of this study. All estimates were completed on a cost per unit bases. The red alignment in each Figure is a preliminary sketch of the alternate being discussed.

**A. Alternate #1 - No Build**

Alternate #1 will be utilizing the existing alignment and pavement. It will be to increase maintenance activities in this project area to improve the side slopes to reinforce the geotechnical issues causing the landslides, followed by routine maintenance to insure the safety of the roadway.

**B. Alternate #2 –Widening through Cut**

Alternate #2 will be shifting the roadway into the mountain to widen the current roadway. Because of the steep grades in this area a passing lane may be ideal since there are a number of trucks that travel through the project area. There may be some issues with maintenance of traffic because benching may be required to excavate enough material to widen the road, and a lane closure may be required to accommodate traffic which could be difficult near blasting times. Widening toward the mountain will also aid in the realignment of the intersection of US 421 and KY 406 since the widening will be away from the intersection. There are a few properties that may be affected, and possibly a house or two could be affected as well. This alternate will help alleviate the need for more slope stabilization items. A sketch of this alternative can be viewed in **Figure 8**.



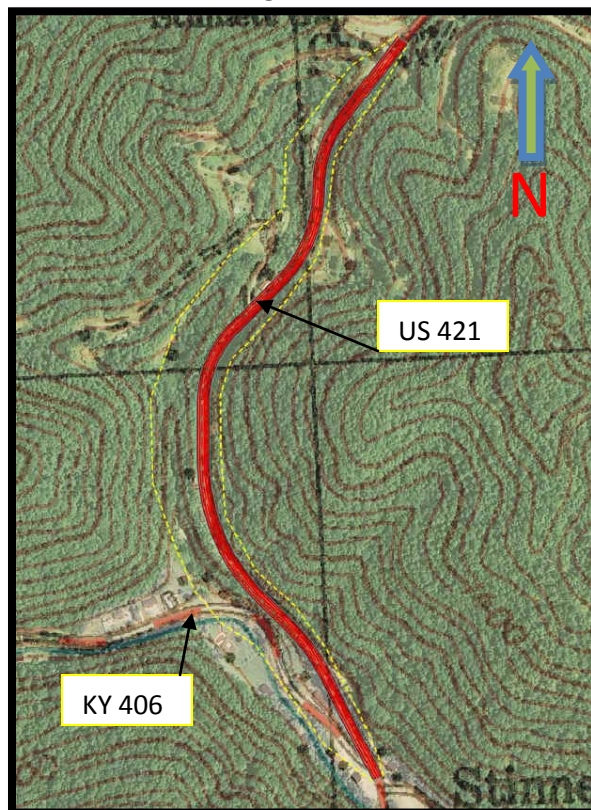
**Figure 8: Alternate #2 Preliminary Route**

The following is the preliminary cost estimated for Alternate #2:

| <u>Phase</u> | <u>Estimate</u>    |
|--------------|--------------------|
| Right of Way | \$400,000          |
| Utilities    | \$200,000          |
| Construction | <u>\$2,500,000</u> |
|              | <b>\$3,100,000</b> |

### C. Alternate #3 –Widening to Fill

Alternate #3 includes widening to the side where it would require fill. The issue with this alternate is that the slope stabilization will be required unless the problematic material under the roadway is taken out which may require embankment benching. Embankment benching may cause problems with maintenance of traffic due to lane closures. Also, this alternate requires a large amount of fill material to widen the roadway sufficiently. Several houses may be affected by this alternate along the route of KY 406 since they're in close vicinity to the bottom of the slope. Also, if you look at Figure 7 there is a gas station along this route that would be affected as well. This fill will also cause problems with the realignment of the intersection of US 421 and KY 406 since it would increase the grade of the intersection causing more sight distance issues. A sketch of this alternate can be seen in **Figure 9**.



**Figure 9: Alternate #3 Preliminary Route**

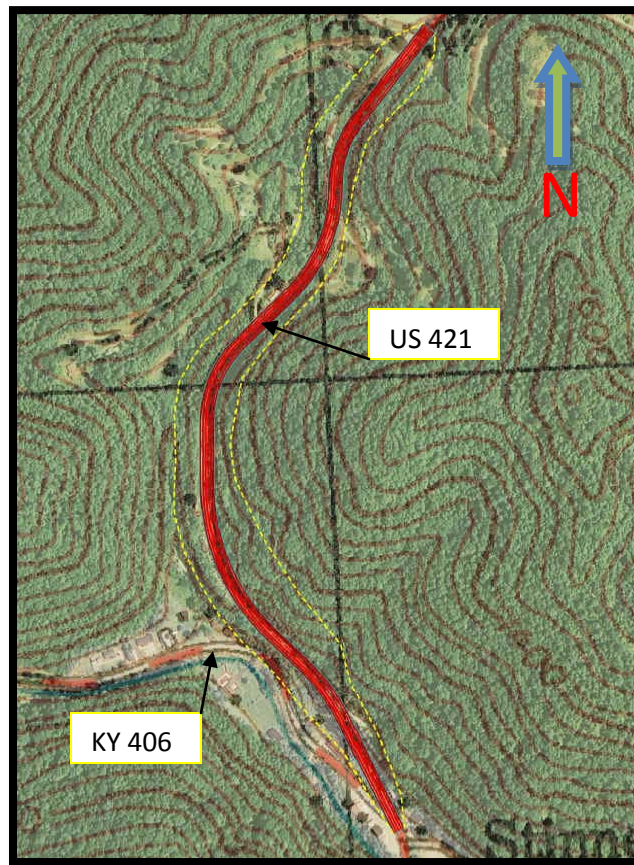


The following is the preliminary cost estimated for Alternate #3:

| <u>Phase</u> | <u>Estimate</u>    |
|--------------|--------------------|
| Right of Way | \$1,000,000        |
| Utilities    | \$200,000          |
| Construction | <u>\$2,200,000</u> |
|              | <b>\$3,400,000</b> |

#### **D. Alternate #4 – Widening to both sides**

Alternate #4 would allow the benefit of getting to use the material from the cut side to use as fill material. This could cut out some costs as the contractor wouldn't have to haul in fill material or haul out so much excavated material. However, like the alternate of widening to the fill side, it could cause major issues with having to acquire ROW as well as the possibility of relocating several home owners. Since it is also being widened to the other side, there are a few more houses that could be affected and would drive up the cost for the ROW phase. Also, there would still be embankment benches required to solve problems with sliver fills and may cause maintenance of traffic problems due to lane closures. The intersection of US 421 and KY 406 would have decreased sight distance since the grade would be steeper. A sketch of this alternate can be seen in **Figure 10**.



**Figure 10: Alternate #4 Preliminary Route**

The following is the preliminary cost estimated for Alternate #4:

| <u>Phase</u> | <u>Estimate</u>    |
|--------------|--------------------|
| Right of Way | \$800,000          |
| Utilities    | \$200,000          |
| Construction | <u>\$2,200,000</u> |
|              | <b>\$3,300,000</b> |

## **VII. SUMMARY**

This study is a Data Needs Analysis (DNA) of a project located on US 421 near Stinnett Creek in Leslie County, Item Number 11-5010.00, from about the intersection of KY 406 extending north a mile. Through analysis of the existing roadway geometrics, crash data, and site visits several needs were identified within the project limits. The following were identified as project needs:

- The amount of ROW acquired and the relocations required need to be as few as possible to reduce the impact to the community.
- With the current grades it makes it difficult for large trucks to build up speed causing traffic to back up down the hill which may indicate the need for widening.
- The roadway is currently sliding off away from the hillside causing maintenance issues as well as traffic hazards as vehicles try to avoid sections of the roadway that are slipping off.

Very steep grades with a large amount of truck traffic creates a hazard as they are slowed significantly going north up the hill. A truck lane could relieve the congestion in this area by allowing faster moving vehicles to maneuver around the trucks. Widening the roadway geometry will increase the sight distance around the horizontal curves through this section of the corridor. This project will improve safety by giving the trucks a climbing lane and allowing traffic to freely flow past them, it will also increase the geometrics of the roadway providing a safer roadway to travel on as it will give the Department the opportunity to reinforce the roadway's base to keep it from sliding.

Included in the alternates were a no build recommendation, three alternates for fixing the landslide problem utilizing both cut and fill options with costs ranging from 3.1 to 3.4 million dollars. All of these alternates are not within the money allocated to this project. More money will need to be requested for the various phases of this project.

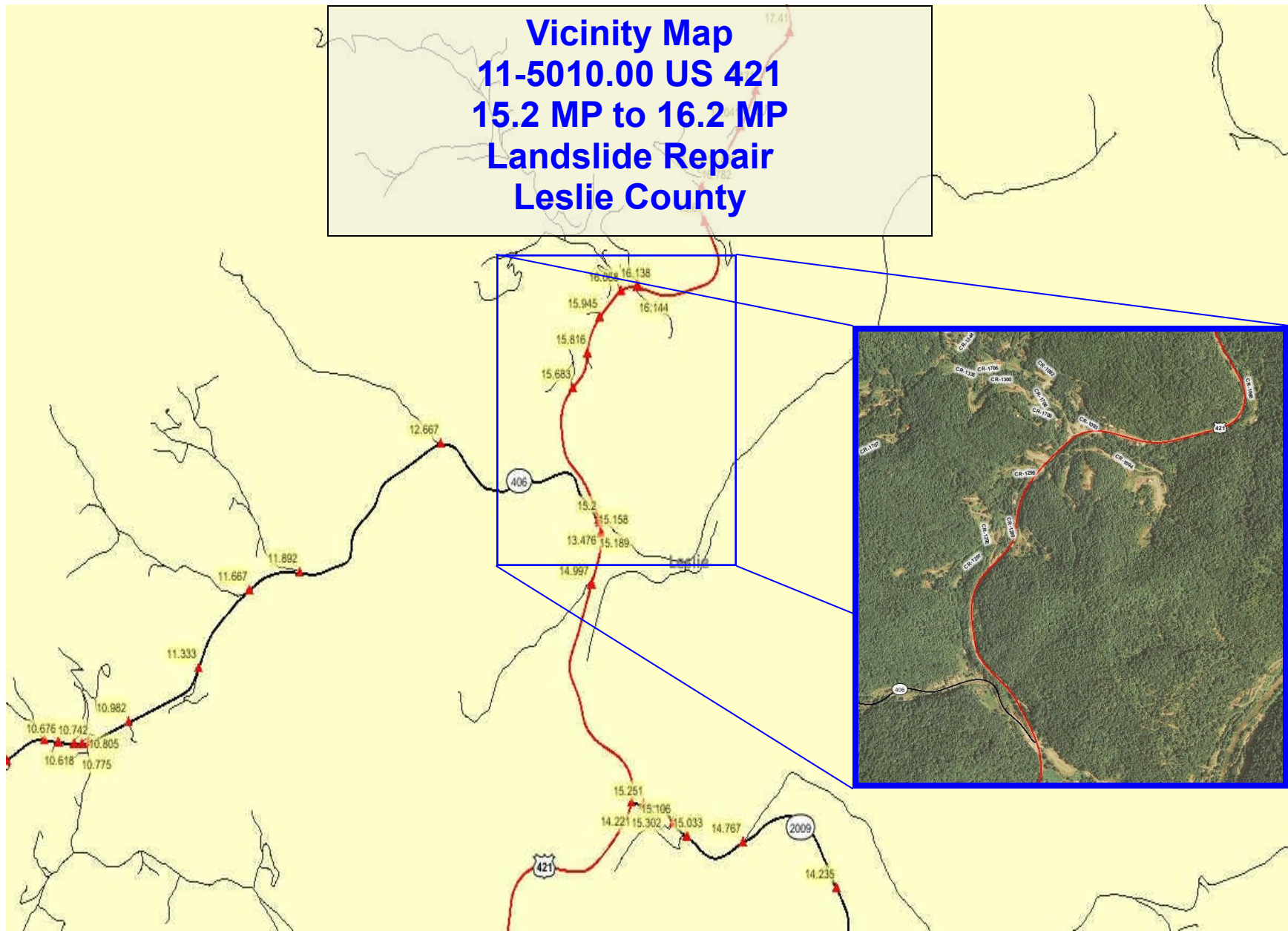
For more information regarding this study please contact:

Erika Smith or Joseph Mosley  
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Division of Highway Design  
603 Railroad Ave.  
Manchester, KY 40962  
(606) 598-2145

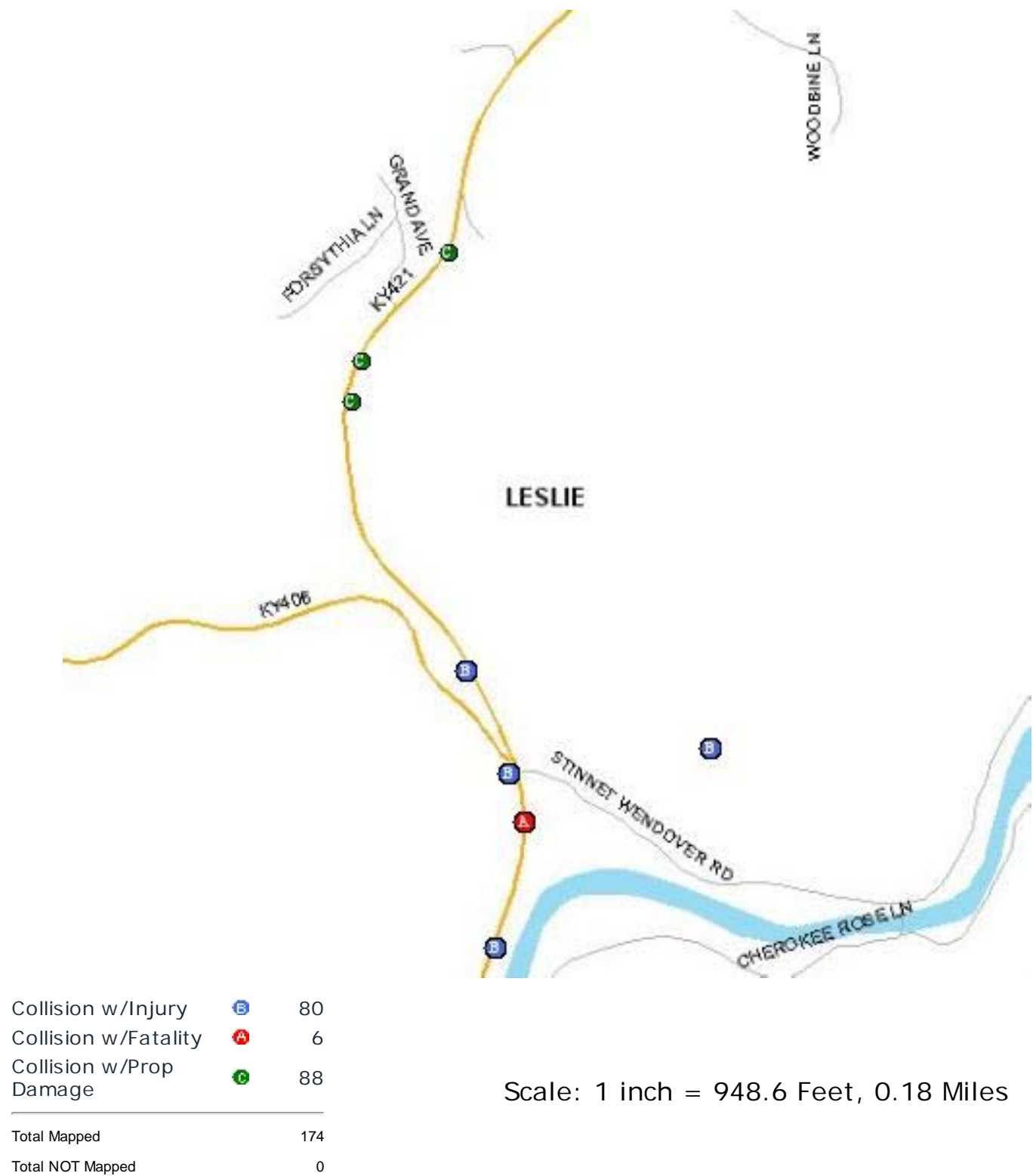
# Appendix A

## -Exhibits-

**Vicinity Map**  
**11-5010.00 US 421**  
**15.2 MP to 16.2 MP**  
**Landslide Repair**  
**Leslie County**



**Criteria:** Collision Date is between 1/1/2007 and 6/15/2011 **And** County Name is one of: LESLIE **And** Roadway Number is US0421





Alternate #2



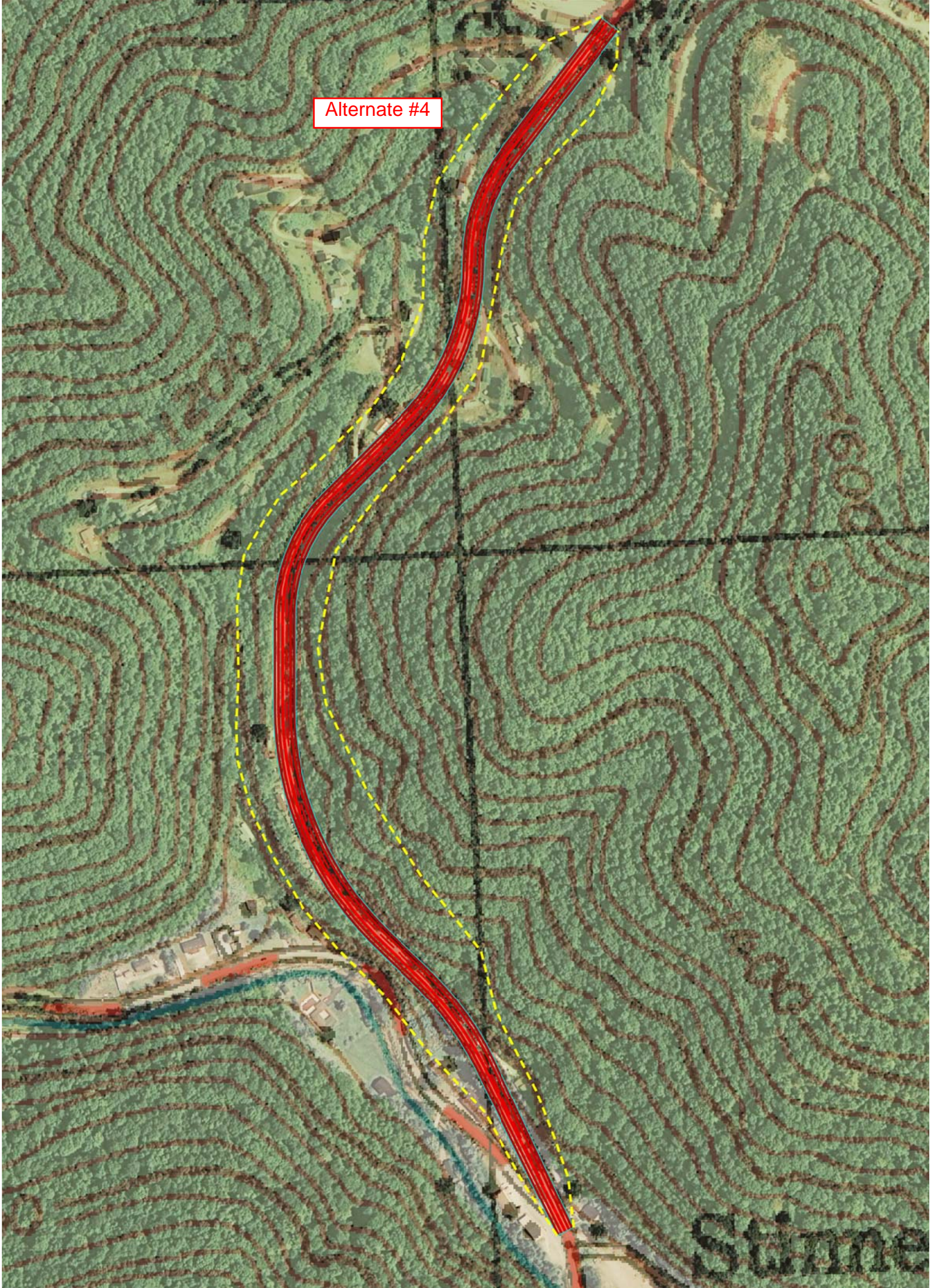


Alternate #3





Alternate #4





# Appendix B

## -Traffic Forecast-

## *Executive Summary*

### **Traffic Forecast Report Leslie County Bridge Replacement On US 421 Over Stinnet Creek Item No. 11-1078.00**

Prepared for:



Prepared by:  
**Jonathan Reynolds, PE**  
Division of Planning  
Kentucky Transportation Cabinet  
March 3, 2011

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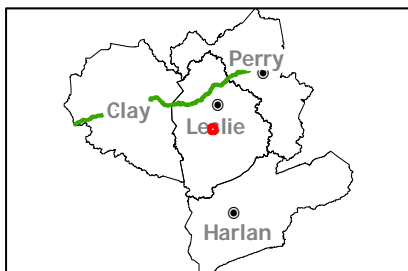
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## **Commonly Used Abbreviations and their Descriptions**

|          |                                |  |
|----------|--------------------------------|--|
| ADT      | Average Daily Traffic          | Without any adjustment                         |
| DHV      | Design Hour Volume             | 30 <sup>th</sup> highest hour of a <u>year</u> |
| ESAL     | Equivalent Single Axle Load    | A measure of traffic's impact on roadway       |
| %T       | Truck Percentage               | The percentage of trucks to total volume       |
| FC       | Functional Class               | Refers to a road's importance                  |
| GR       | Growth Rate                    | A value normally compounded annually           |
| PHF      | Peak Hour Factor               | Considers a 15 minute spike in an hourly count |
| K-Factor | K-30 <sup>th</sup> hour Factor | DHV divided by ADT (DHV/ADT)                   |
| D-Factor | Directional Factor             | Percentage of dominant flow to total           |
| MP       | Mile Point                     | Miles increase easterly and northerly          |
| ATR      | Automatic Traffic Recorder     | A permanent & continuous recording station     |
| KYSTM    | Kentucky Statewide Model       | A computerized representation of KY roads      |



# Vicinity Map



Bridge Replacement on US 421  
at MP 15.2 over Stinnet Creek  
Item #11-1078.00



## Legend



Project Location

0 0.03 0.06 0.12  
Miles

**Traffic Forecast Executive Summary  
Leslie County: Bridge Replacement On US 421 Over Stinnet  
Creek  
Item No. 11-1078.00**

**FORECAST SUMMARY**

The project calls for replacing the bridge over Stinnet Creek on US 421 in Leslie County. The purpose of this report is to analyze current and future traffic utilizing US 421 bridge between MP 15.137 and MP 15.177. District 11 requested traffic forecasts for the project road segment.

**FORECAST TYPE**

The following types of forecasts were developed:

- 2011 and 2035 ADT and DHV values
- 2011 and 2035 Average Daily and Design Hourly Truck Percent Forecasts
- 20-year ESALs

**BASE-YEAR VOLUMES**

The 2011 ADT volume is based on the most recent 48 hours of count data collected at traffic station 066501 (see page 6). The traffic count data for this station was collected at MP 14.9 on US 421. All figures are subject to rounding.

**DESIGN-YEAR/GROWTH FACTORS**

The Kentucky State Data Center predicts negative population growth in Leslie County between now and 2035 (see page 5). However, exponential growth analyses performed on historical data from stations 066501 and 066767 reveal traffic volumes on this section of US 421 have been growing 2.0% annually (see page 6). A 2.0% growth rate was used for the purposes of this forecast.

**DESIGN HOUR FACTORS**

DHVs were estimated by analyzing the most recent hourly volume data collected at station 066501. The peak AM and PM volumes were derived by dividing the highest hourly volumes from these counts by their daily totals. Functional class design hour factors based on the day and month of these counts were then applied. Finally the calculated K-factors were used in combination with the ADT forecast to produce DHVs for 2011 and 2035.

## **TRUCK PERCENTAGE**

A 2009 vehicle classification count conducted on US 421 at station 066508 at MP 8.7 and a 2007 vehicle classification count conducted on US 421 at station 066767 at MP 20.5 provided a historical truck percentage data for US 421. Statewide research indicates a 1.0% annual growth rate for %T may be applied as a component of the overall traffic growth on rural major collector roads. Also the Kentucky Official Coal Haul Highway System 2010 report shows that coal trucks used this segment of road. These components factored into the analysis of the ESAL calculations.

## **ESALs**

Functional class averages from ATR data, traffic counts, and the 2035 ADT projections were used to estimate 20-year ESALs on the project road segment. The 2007 aggregated ESAL report, generated by the Kentucky Transportation Center in collaboration with the Kentucky Transportation Cabinet, were used to grow the important ESAL calculation variables. For more information please see the attached ESAL calculation sheets.

## **TURN MOVEMENTS**

Turn movements were not requested and therefore not included.

*Traffic Forecast Technical Report*  
*Leslie County: Bridge Replacement On US 421 Over Stinnet Creek*  
*Item No. 11-1078.00*

### HISTORICAL POPULATION SUMMARY

|           | 1950       | 1960       | 1970       | 1980       | 1990       | 2000       | 50 - 60 | 60 - 70 | 70 - 80 | 80 - 90 | 90 - 00 |
|-----------|------------|------------|------------|------------|------------|------------|---------|---------|---------|---------|---------|
|           | Population | Population | Population | Population | Population | Population | Pct     | Change  | Pct     | Change  | Pct     |
| Kentucky  | -          | 3,038,156  | 3,220,711  | 3,660,334  | 3,686,892  | 4,041,769  | -       | 6.0%    | 13.6%   | 0.7%    | 9.6%    |
| Leslie Co | -          | -          | 11,623     | 14,882     | 13,642     | 12,401     | -       | -       | 28.0%   | -8.3%   | -9.1%   |

Sources: US Bureau of the Census; Kentucky State Data Center

### FUTURE POPULATION PROJECTIONS SUMMARY

|           | 2005       | 2010       | 2015       | 2020       | 2025       | 2030       | 05 - 10 | 10 - 15 | 15 - 20 | 20 - 25 | 25 - 30 |
|-----------|------------|------------|------------|------------|------------|------------|---------|---------|---------|---------|---------|
|           | Projection | Projection | Projection | Projection | Projection | Projection | Change  | Change  | Change  | Change  | Change  |
| Kentucky  | 4,171,016  | 4,326,490  | 4,502,595  | 4,660,703  | 4,799,443  | 4,912,621  | 3.7%    | 4.1%    | 3.5%    | 3.0%    | 2.4%    |
| Leslie Co | 11,886     | 11,736     | 11,478     | 11,235     | 10,987     | 10,735     | -1.3%   | -2.2%   | -2.1%   | -2.2%   | -2.3%   |

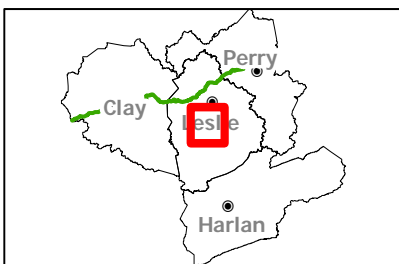
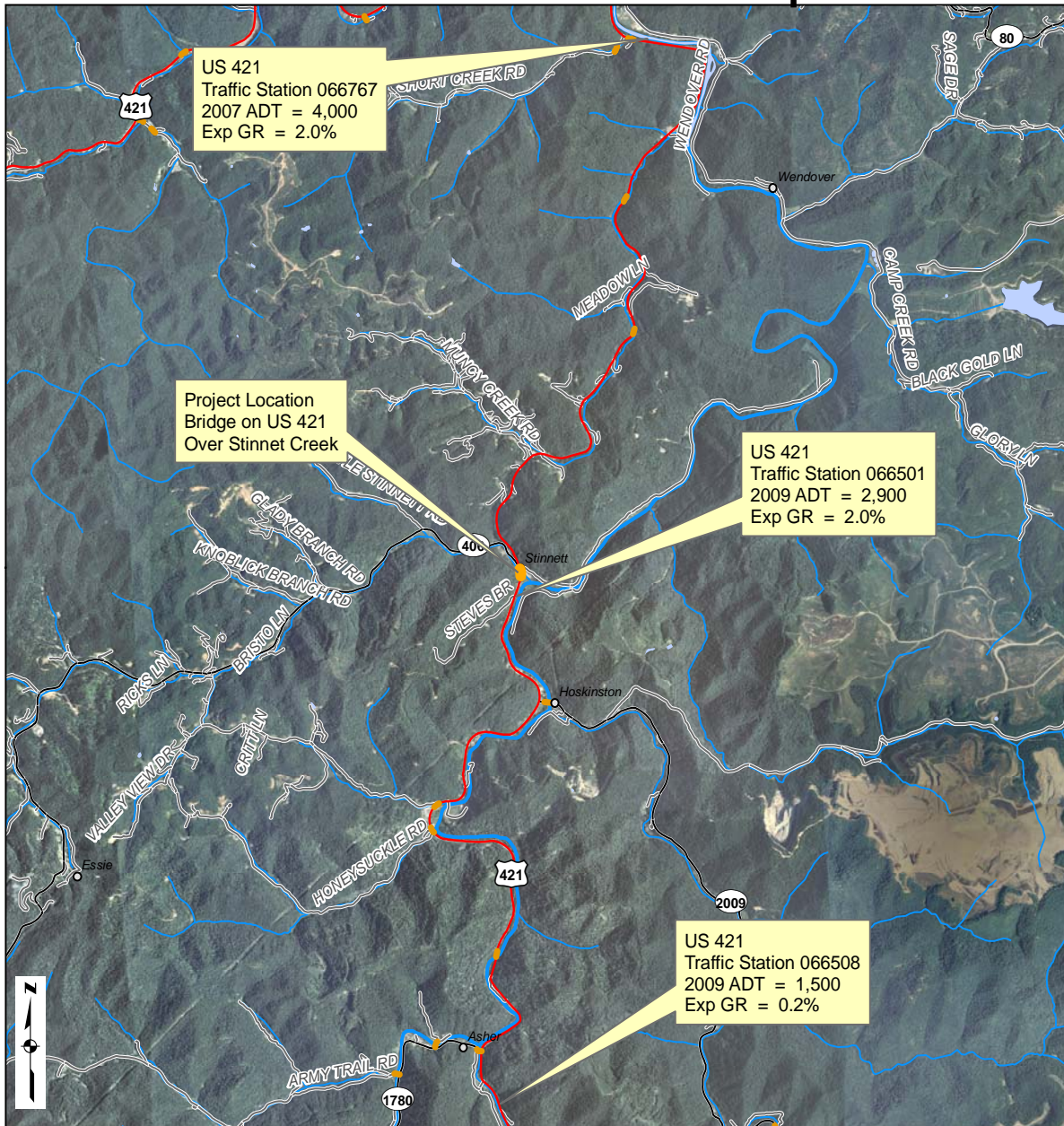
Sources: US Bureau of the Census; Kentucky State Data Center

### ANNUAL POPULATION GROWTH RATES FROM HISTORICAL DATA AND PROJECTIONS

|           | 50 - 60 | 60 - 70 | 70 - 80 | 80 - 90 | 90 - 00 | 05 - 10 | 10 - 15 | 15 - 20 | 20 - 25 | 25 - 30 | 05 - 25 |
|-----------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
|           | GR      | GR      | GR      | GR      | GR      | GR      | GR      | GR      | GR      | GR      | GR      |
| Kentucky  | -       | 0.59%   | 1.29%   | 0.07%   | 0.92%   | 0.73%   | 0.80%   | 0.69%   | 0.59%   | 0.47%   | 0.70%   |
| Leslie Co | -       | -       | 2.50%   | -0.87%  | -0.95%  | -0.25%  | -0.44%  | -0.43%  | -0.45%  | -0.46%  | -0.39%  |



# Traffic Station Map



Bridge Replacement on US 421  
 at MP 15.2 over Stinnet Creek  
 Item #11-1078.00



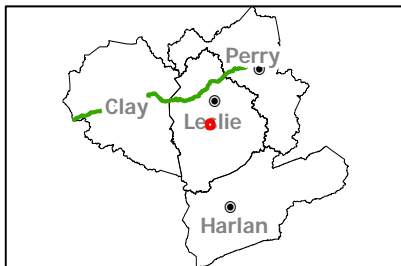
## Legend

Project Location

0 0.375 0.75 1.5  
 Miles



# Summary Map



Bridge Replacement on US 421  
 at MP 15.2 over Stinnet Creek  
 Item #11-1078.00



## Legend



Project Location

0 0.03 0.06 0.12 Miles



*Traffic Forecast Technical Report*  
*Leslie County: Bridge Replacement On US 421 Over Stinnet Creek*  
*Item No. 11-1078.00*

**FORECAST OF EQUIVALENT SINGLE AXLE LOAD ACCUMULATIONS (20-year)**

**ROUTE ID:**

|                     |  |              |                       |
|---------------------|--|--------------|-----------------------|
| County              | Leslie                                       | Date         | 02/11/11              |
| Road Name           | US 421                                       | Forecaster   | Jonathan Reynolds, PE |
| Functional Class    | 6 - Rural Minor Arterial                     | MARS No.     | 8442101D              |
| Project Description | Bridge Replacement US 421 Over Stinnet Creek | Item No.     | 11-1078.00            |
| Scenario            | Build  | Route No.    | US 421                |
| Segment Description | Bridge Replacement US 421 Over Stinnet Creek | Beg. MP      | 15.137                |
|                     |  | End MP       | 15.177                |
|                     |  | T.F. No.     | 10.035                |
|                     |  | No. of Lanes | 2                     |
|                     |  | 1 or 2 way   | 2                     |

**REFERENCES:**

|                    |                       |                              |                  |
|--------------------|-----------------------|------------------------------|------------------|
| Previous Forecasts | 0                     | K- Factor Value              | 11.7%            |
| Traffic Volume     | 066501                | K-Factor Source              | 066501           |
| Milepoint          | 14.9                  | PHF                          | 0.9              |
| Truck Percent      | 066501                | Full Route Unique Identifier |                  |
| Milepoint          | 14.9                  |                              | 066-US-0421 -000 |
| ESAL Information   | 2007 Aggregated ESALS |                              |                  |
| Growth Rate        | 2.00%                 |                              |                  |

**TRAFFIC PARAMETERS:**

|                             |           | Present<br>Year | Growth<br>Rate | Construction<br>Year | Median<br>Year | Design<br>Year |
|-----------------------------|-----------|-----------------|----------------|----------------------|----------------|----------------|
|                             |           | 2011            |                | 2015                 | 2025           | 2035           |
| Volume                      | (AADT)    | 3000            | 2.00%          | 3200                 | 4000           | 4800           |
| Percent Trucks              | (%T)      | 10.0%           | 1.0%           | 10%                  | 11%            | 13%            |
| Number of Trucks            |           | 300             | 3.0%           | 320                  | 440            | 620            |
| Percent Trucks Hauling Coal | (%CT)     | 0%              | -3.0%          | 0%                   | 0%             | 0%             |
| <i>Non-Coal Trucks:</i>     |           |                 |                |                      |                |                |
| Axles/Truck                 | (A/T)     | 3.400           | 0.00%          | 3.400                | 3.400          | 3.400          |
| ESALs/Axle                  | (ESAL/A)  | 0.260           | 1.60%          | 0.277                | 0.325          | 0.381          |
| <i>Coal Trucks:</i>         |           |                 |                |                      |                |                |
| Axles/Truck                 | (A/CT)    | 5.123           | 0.00%          | 5.123                | 5.123          | 5.123          |
| ESALs/Axle                  | (ESAL/CA) | 3.3             | 0.00%          | 3.300                | 3.300          | 3.300          |

**ESAL CALCULATIONS:** SEE ATTACHED ESAL CALCULATION SHEET

Design ESALs in Critical Lane 2,000,000

General Comments:

*Traffic Forecast Technical Report*  
*Leslie County: Bridge Replacement On US 421 Over Stinnet Creek*  
*Item No. 11-1078.00*

| <b>Bridge Replacement US 421 Over Stinnet Creek (Build)</b> |       |       |         |       |      |         |       |         |       |         |  |  |
|---|-------|-------|---------|-------|------|---------|-------|---------|-------|---------|--|--|
| Year  | ADT   | Car % | Truck % | CT%   | AX/T | ESAL/AX | AX/CT | ESAL/CA | LDF   | ESALs   |  |  |
| 2015  | 3,247 | 89.6% | 10.4%   | 0.15% | 3.40 | 0.28    | 5.123 | 3.3     | 0.500 | 62,201  |  |  |
| 2016  | 3,312 | 89.5% | 10.5%   | 0.14% | 3.40 | 0.28    | 5.123 | 3.3     | 0.500 | 64,961  |  |  |
| 2017  | 3,378 | 89.4% | 10.6%   | 0.14% | 3.40 | 0.29    | 5.123 | 3.3     | 0.500 | 67,849  |  |  |
| 2018  | 3,446 | 89.3% | 10.7%   | 0.14% | 3.40 | 0.29    | 5.123 | 3.3     | 0.500 | 70,870  |  |  |
| 2019  | 3,515 | 89.2% | 10.8%   | 0.13% | 3.40 | 0.30    | 5.123 | 3.3     | 0.500 | 74,031  |  |  |
| 2020  | 3,585 | 89.1% | 10.9%   | 0.13% | 3.40 | 0.30    | 5.123 | 3.3     | 0.500 | 77,338  |  |  |
| 2021  | 3,657 | 89.0% | 11.0%   | 0.12% | 3.40 | 0.30    | 5.123 | 3.3     | 0.500 | 80,798  |  |  |
| 2022  | 3,730 | 88.9% | 11.2%   | 0.12% | 3.40 | 0.31    | 5.123 | 3.3     | 0.500 | 84,418  |  |  |
| 2023  | 3,805 | 88.7% | 11.3%   | 0.12% | 3.40 | 0.31    | 5.123 | 3.3     | 0.500 | 88,205  |  |  |
| 2024  | 3,881 | 88.6% | 11.4%   | 0.11% | 3.40 | 0.32    | 5.123 | 3.3     | 0.500 | 92,168  |  |  |
| 2025  | 3,958 | 88.5% | 11.5%   | 0.11% | 3.40 | 0.32    | 5.123 | 3.3     | 0.500 | 96,314  |  |  |
| 2026  | 4,038 | 88.4% | 11.6%   | 0.11% | 3.40 | 0.33    | 5.123 | 3.3     | 0.500 | 100,651 |  |  |
| 2027  | 4,118 | 88.3% | 11.7%   | 0.10% | 3.40 | 0.34    | 5.123 | 3.3     | 0.500 | 105,190 |  |  |
| 2028  | 4,201 | 88.2% | 11.8%   | 0.10% | 3.40 | 0.34    | 5.123 | 3.3     | 0.500 | 109,939 |  |  |
| 2029  | 4,285 | 88.0% | 12.0%   | 0.10% | 3.40 | 0.35    | 5.123 | 3.3     | 0.500 | 114,907 |  |  |
| 2030  | 4,370 | 87.9% | 12.1%   | 0.09% | 3.40 | 0.35    | 5.123 | 3.3     | 0.500 | 120,106 |  |  |
| 2031  | 4,458 | 87.8% | 12.2%   | 0.09% | 3.40 | 0.36    | 5.123 | 3.3     | 0.500 | 125,546 |  |  |
| 2032  | 4,547 | 87.7% | 12.3%   | 0.09% | 3.40 | 0.36    | 5.123 | 3.3     | 0.500 | 131,238 |  |  |
| 2033  | 4,638 | 87.6% | 12.4%   | 0.09% | 3.40 | 0.37    | 5.123 | 3.3     | 0.500 | 137,194 |  |  |
| 2034  | 4,731 | 87.4% | 12.6%   | 0.08% | 3.40 | 0.37    | 5.123 | 3.3     | 0.500 | 143,426 |  |  |
| 2035  | 4,825 | 87.3% | 12.7%   | 0.08% | 3.40 | 0.38    | 5.123 | 3.3     | 0.500 | 149,947 |  |  |

# Appendix C

## -Collision Data-

| MASTER FILE NUMBER | ROADWAY # | ROADWAY NAME | MP    | DATE      | TIME | UNITS | KILLED | INJURED | WEATHER                        | CONDITION  | MANNER OF COLLISION | ROADWAY CHARACTER    | LIGHT CONDITION         |
|--------------------|-----------|--------------|-------|-----------|------|-------|--------|---------|--------------------------------|------------|---------------------|----------------------|-------------------------|
| 70599133           | US0421    | KY421        | 14.94 | 01-Aug-08 | 1030 | 2     | 0      | 2       | CLEAR                          | DRY        | ANGLE               | STRAIGHT & LEVEL     | DAYLIGHT                |
| 70802028           | US0421    | KY421        | 15.15 | 30-Dec-09 | 2225 | 2     | 1      | 0       | RAINING                        | WET        | SINGLE VEHICLE      | CURVE & LEVEL        | DARK-HWY<br>LIGHTED/OFF |
| 70901171           | US0421    | KY421        | 15.19 | 03-Sep-10 | 1815 | 2     | 0      | 3       | CLEAR                          | DRY        | OPPOSING LEFT TURN  | STRAIGHT & GRADE     | DAYLIGHT                |
| 70740143           | US0421    | KY421        | 15.3  | 04-Aug-09 | 1550 | 1     | 0      | 3       | CLOUDY                         | WET        | SINGLE VEHICLE      | CURVE & GRADE        | DAYLIGHT                |
| 70560045           | US0421    | KY421        | 15.57 | 27-Apr-08 | 1418 | 2     | 0      | 0       | RAINING                        | WET        | REAR END            | STRAIGHT & HILLCREST | DAYLIGHT                |
| 70860555           | US0421    | KY421        | 15.6  | 04-Jun-10 | 0001 | 1     | 0      | 0       | CLOUDY                         | DRY        | SINGLE VEHICLE      | CURVE & HILLCREST    | DARK-HWY NOT<br>LIGHTED |
| 70757253           | US0421    | KY421        | 15.74 | 25-Sep-09 | 2215 | 2     | 0      | 0       | CLOUDY                         | WET        | HEAD ON             | CURVE & GRADE        | DARK-HWY NOT<br>LIGHTED |
| 70965779           | US0421    | KY421        | 16.73 | 09-Feb-11 | 1821 | 1     | 0      | 0       | BLOWING<br>SAND/SOIL/DIRT/SNOW | SNOW/SLUSH | SINGLE VEHICLE      | CURVE & GRADE        | DARK-HWY NOT<br>LIGHTED |
| 70664374           | US0421    | KY421        | 16.74 | 03-Feb-09 | 1530 | 1     | 0      | 3       | SNOWING                        | ICE        | SINGLE VEHICLE      | CURVE & LEVEL        | DAYLIGHT                |

Appendix D  
-KYTC Common  
Geometric Practice  
Guidelines-

# **COMMON GEOMETRIC PRACTICES** **RURAL ARTERIAL ROADS (OTHER THAN FREEWAYS)** ④

|  |              |                          |      | TRAFFIC VOLUME           |      |                    |      |                     |      |                     |      |      |      |
|--|--------------|--------------------------|------|--------------------------|------|--------------------|------|---------------------|------|---------------------|------|------|------|
|  |              |                          |      | UNDER 400<br>A.D.T.      |      | 400-1500<br>A.D.T. |      | 1500-2000<br>A.D.T. |      | OVER 2000<br>A.D.T. |      |      |      |
|  |              | DESIGN SPEED ⑥           |      | 40-50 M.P.H.             |      | 40-70 M.P.H.       |      | 40-70 M.P.H.        |      | 40-70 M.P.H.        |      |      |      |
| PAVEMENT<br>WIDTH<br>(FEET)  | 40 MPH       |                          |      | 22                       | 22   | 22                 |      | 24                  | 24   |                     |      |      |      |
|  | 45 MPH       |                          |      |                          |      |                    |      |                     |      |                     |      |      |      |
|  | 50 MPH       |                          |      |                          |      |                    |      |                     |      |                     |      |      |      |
|  | 55 MPH       |                          |      | 24                       | 24   | 24                 |      |                     |      |                     |      |      |      |
|  | 60 MPH       |                          |      |                          |      |                    |      |                     |      |                     |      |      |      |
|  | 65 MPH       |                          |      |                          |      |                    |      |                     |      |                     |      |      |      |
|  | 70 MPH       |                          |      |                          |      |                    |      |                     |      |                     |      |      |      |
| MINIMUM GRADED<br>SHOULDER WIDTH (FT) ⑤                            |              | ALL<br>SPEEDS            |      | 4                        |      | 6                  |      | 6                   |      | 8                   |      |      |      |
| MINIMUM CLEAR ROADWAY<br>WIDTH OF NEW AND<br>RECONSTRUCTED BRIDGES |              | ALL<br>SPEEDS            |      | APPROACH ROADWAY WIDTH ① |      |                    |      |                     |      |                     |      |      |      |
| MINIMUM<br>RADIUS<br>(FEET)  | DESIGN SPEED |                          |      | eMAX. 4%                 |      | eMAX. 6%           |      | eMAX. 8%            |      |                     |      |      |      |
|  | 30 MPH       |                          |      | 300                      |      | 275                |      | 250                 |      |                     |      |      |      |
|  | 35 MPH       |                          |      | 420                      |      | 380                |      | 350                 |      |                     |      |      |      |
|  | 40 MPH       |                          |      | 565                      |      | 510                |      | 465                 |      |                     |      |      |      |
|  | 45 MPH       |                          |      | 730                      |      | 660                |      | 600                 |      |                     |      |      |      |
|  | 50 MPH       |                          |      | 930                      |      | 835                |      | 760                 |      |                     |      |      |      |
|  | 55 MPH       |                          |      | 1190                     |      | 1065               |      | 965                 |      |                     |      |      |      |
|  | 60 MPH       |                          |      | 1505                     |      | 1340               |      | 1205                |      |                     |      |      |      |
|  | 65 MPH       |                          |      | —                        |      | 1660               |      | 1485                |      |                     |      |      |      |
|  | 70 MPH       |                          |      | —                        |      | 2050               |      | 1820                |      |                     |      |      |      |
| NORMAL PAVEMENT<br>CROSS SLOPES ③                                  |              | RATE OF CROSS SLOPE = 2% |      |                          |      |                    |      |                     |      |                     |      |      |      |
| NORMAL SHOULDER<br>CROSS SLOPES                                    |              | EARTH = 8% PAVED = 4%    |      |                          |      |                    |      |                     |      |                     |      |      |      |
| MAXIMUM<br>GRADE<br>(PERCENT)                                      | M.P.H.       | 30                       | 35   | 40                       | 45   | 50                 | 55   | 60                  | 65   | 70                  | 75   | 80   |      |
|  | LEVEL        | -                        | -    | 5                        | -    | 4                  | -    | -                   | -    | 3                   | -    | -    |      |
|  | ROLLING      | -                        | -    | 6                        | -    | 5                  | -    | -                   | -    | 4                   | -    | -    |      |
|  | MOUNTAIN     | -                        | -    | 8                        | 7    | -                  | 6    | -                   | -    | 5                   | -    | -    |      |
| MINIMUM STOPPING<br>SIGHT DISTANCE ①                               |              | (FEET)                   | 200  | 250                      | 305  | 360                | 425  | 495                 | 570  | 645                 | 730  | 820  | 910  |
| MINIMUM PASSING<br>SIGHT DISTANCE ②                                |              | (FEET)                   | 1090 | 1280                     | 1470 | 1625               | 1835 | 1985                | 2135 | 2285                | 2480 | 2580 | 2680 |

- ① MINIMUM STOPPING SIGHT DISTANCES ARE BASED ON HEIGHT OF EYE OF 3.5 FT AND HEIGHT OF OBJECT OF 2.0 FT. BOTH HORIZONTAL AND VERTICAL ALIGNMENTS ARE CONSIDERED.
- ② MINIMUM PASSING SIGHT DISTANCES ARE BASED ON HEIGHT OF EYE 3.5 FT AND HEIGHT OF OBJECT OF 3.5 FT. BOTH HORIZONTAL AND VERTICAL ALIGNMENTS ARE CONSIDERED.
- ③ NORMAL PAVEMENT CROSS SLOPES ON BRIDGES SHALL BE 2%.
- ④ FOR GUIDANCE ON FREEWAYS, REFER TO AASHTO, "A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS", CURRENT EDITION.
- ⑤ WIDEN 3 FT FOR GUARDRAIL.
- ⑥ JUSTIFICATION FOR A DESIGN SPEED LESS THAN THE REGULATORY OR POSTED SPEED MUST BE DOCUMENTED AND AVAILABLE FOR REVIEW IN THE PROJECT FILES.



# Appendix E

## -Existing Roadway Plans-

LESLIE

EQUATION:  $MA(1366786) =$   
 $MA(1366786) =$

Equation 1978-11-15

L.A. 100-87603-103

2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 2041 2042 2043 2044 2045 2046 2047 2048 2049 2050 2051 2052 2053 2054 2055 2056 2057 2058 2059 2060 2061 2062 2063 2064 2065 2066 2067 2068 2069 2070 2071 2072 2073 2074 2075 2076 2077 2078 2079 2080 2081 2082 2083 2084 2085 2086 2087 2088 2089 2090 2091 2092 2093 2094 2095 2096 2097 2098 2099 2100 2101 2102 2103 2104 2105 2106 2107 2108 2109 2110 2111 2112 2113 2114 2115 2116 2117 2118 2119 2120 2121 2122 2123 2124 2125 2126 2127 2128 2129 2130 2131 2132 2133 2134 2135 2136 2137 2138 2139 2140 2141 2142 2143 2144 2145 2146 2147 2148 2149 2150 2151 2152 2153 2154 2155 2156 2157 2158 2159 2160 2161 2162 2163 2164 2165 2166 2167 2168 2169 2170 2171 2172 2173 2174 2175 2176 2177 2178 2179 2180 2181 2182 2183 2184 2185 2186 2187 2188 2189 2190 2191 2192 2193 2194 2195 2196 2197 2198 2199 2200 2201 2202 2203 2204 2205 2206 2207 2208 2209 2210 2211 2212 2213 2214 2215 2216 2217 2218 2219 2220 2221 2222 2223 2224 2225 2226 2227 2228 2229 2230 2231 2232 2233 2234 2235 2236 2237 2238 2239 2240 2241 2242 2243 2244 2245 2246 2247 2248 2249 2250 2251 2252 2253 2254 2255 2256 2257 2258 2259 2260 2261 2262 2263 2264 2265 2266 2267 2268 2269 2270 2271 2272 2273 2274 2275 2276 2277 2278 2279 2280 2281 2282 2283 2284 2285 2286 2287 2288 2289 2290 2291 2292 2293 2294 2295 2296 2297 2298 2299 2300 2301 2302 2303 2304 2305 2306 2307 2308 2309 2310 2311 2312 2313 2314 2315 2316 2317 2318 2319 2320 2321 2322 2323 2324 2325 2326 2327 2328 2329 2330 2331 2332 2333 2334 2335 2336 2337 2338 2339 2340 2341 2342 2343 2344 2345 2346 2347 2348 2349 2350 2351 2352 2353 2354 2355 2356 2357 2358 2359 2360 2361 2362 2363 2364 2365 2366 2367 2368 2369 2370 2371 2372 2373 2374 2375 2376 2377 2378 2379 2380 2381 2382 2383 2384 2385 2386 2387 2388 2389 2390 2391 2392 2393 2394 2395 2396 2397 2398 2399 2400 2401 2402 2403 2404 2405 2406 2407 2408 2409 2410 2411 2412 2413 2414 2415 2416 2417 2418 2419 2420 2421 2422 2423 2424 2425 2426 2427 2428 2429 2430 2431 2432 2433 2434 2435 2436 2437 2438 2439 2440 2441 2442 2443 2444 2445 2446 2447 2448 2449 2450 2451 2452 2453 2454 2455 2456 2457 2458 2459 2460 2461 2462 2463 2464 2465 2466 2467 2468 2469 2470 2471 2472 2473 2474 2475 2476 2477 2478 2479 2480 2481 2482 2483 2484 2485 2486 2487 2488 2489 2490 2491 2492 2493 2494 2495 2496 2497 2498 2499 2500 2501 2502 2503 2504 2505 2506 2507 2508 2509 2510 2511 2512 2513 2514 2515 2516 2517 2518 2519 2520 2521 2522 2523 2524 2525 2526 2527 2528 2529 2530 2531 2532 2533 2534 2535 2536 2537 2538 2539 2540 2541 2542 2543 2544 2545 2546 2547 2548 2549 2550 2551 2552 2553 2554 2555 2556 2557 2558 2559 2560 2561 2562 2563 2564 2565 2566 2567 2568 2569 2570 2571 2572 2573 2574 2575 2576 2577 2578 2579 2580 2581 2582 2583 2584 2585 2586 2587 2588 2589 2590 2591 2592 2593 2594 2595 2596 2597 2598 2599 2600 2601 2602 2603 2604 2605 2606 2607 2608 2609 2610 2611 2612 2613 2614 2615 2616 2617 2618 2619 2620 2621 2622 2623 2624 2625 2626 2627 2628 2629 2630 2631 2632 2633 2634 2635 2636 2637 2638 2639 2640 2641 2642 2643 2644 2645 2646 2647 2648 2649 2650 2651 2652 2653 2654 2655 2656 2657 2658 2659 2660 2661 2662 2663 2664 2665 2666 2667 2668 2669 2670 2671 2672 2673 2674 2675 2676 2677 2678 2679 2680 2681 2682 2683 2684 2685 2686 2687 2688 2689 2690 2691 2692 2693 2694 2695 2696 2697 2698 2699 2700 2701 2702 2703 2704 2705 2706 2707 2708 2709 2710 2711 2712 2713 2714 2715 2716 2717 2718 2719 2720 2721 2722 2723 2724 2725 2726 2727 2728 2729 2730 2731 2732 2733 2734 2735 2736 2737 2738 2739 2740 2741 2742 2743 2744 2745 2746 2747 2748 2749 2750 2751 2752 2753 2754 2755 2756 2757 2758 2759 2760 2761 2762 2763 2764 2765 2766 2767 2768 2769 2770 2771 2772 2773 2774 2775 2776 2777 2778 2779 2780 2781 2782 2783 2784 2785 2786 2787 2788 2789 2790 2791 2792 2793 2794 2795 2796 2797 2798 2799 2800 2801 2802 2803 2804 2805 2806 2807 2808 2809 2810 2811 2812 2813 2814 2815 2816 2817 2818

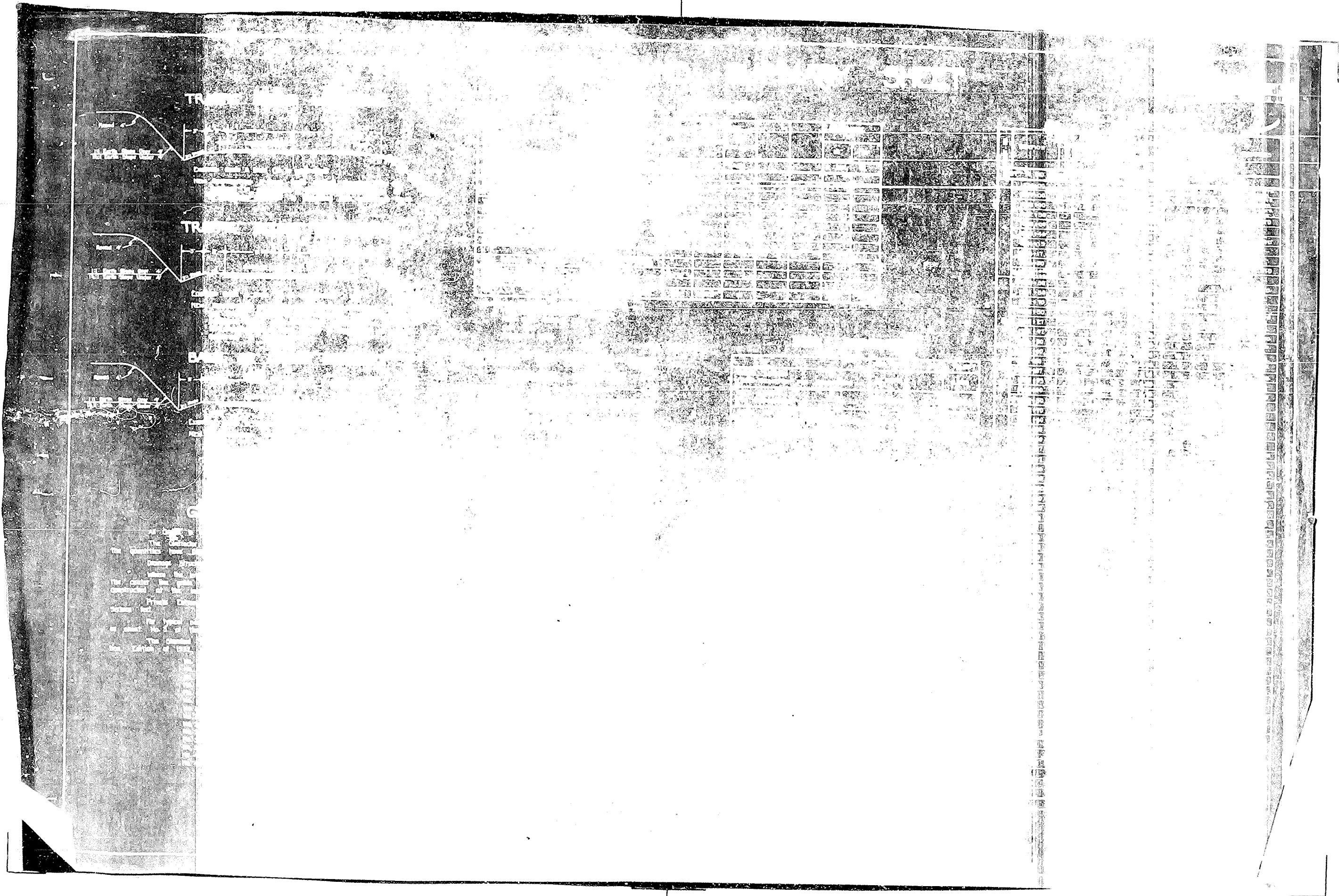
U.S. DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT  
WASHINGTON, D.C. 20250

AS  
BLUT

DECLASSIFIED

[illegible]

FR 114 B-GS  
LESLIE  
Harlan-Hyden  
G4D-Gravel





# SUMMARY OF QUANTITIES

LESLIE CO.-FR 114 B-GS

Sheet No. 2A of 18

2A

## GENERAL SUMMARY

| SHEET NO. | STATION TO STATION   | CLEARING AND GRUBBING | EXCAVATION UNCLASSIFIED | CONCRETE | FINAL  | SPRING | PIPE    |
|-----------|----------------------|-----------------------|-------------------------|----------|--------|--------|---------|
|           | UNIT                 | ACRE                  | CU YD                   | CU YD    | STA.   | EACH   | 15" 24" |
| 4         | 1270+00 - 1299+30    | 569                   | 20595                   |          |        |        |         |
| 5         | 1299+30 - 1326+85    | 674                   | 27950                   |          |        |        |         |
| 6         | 1326+85 - 1359+75    | 676                   | 52617                   |          |        |        |         |
| 7         | 1359+75 - 1395+00    | 891                   | 50334                   |          |        |        |         |
| 8         | 1395+00 - 1421+50    | 597                   | 31093                   |          |        |        |         |
| 9         | 1421+50 - 1455+00    | 707                   | 33154                   |          |        |        |         |
| 10        | 1455+00 - 1481+55    | 804                   | 32368                   |          |        |        |         |
| 11        | 1481+55 - 1500+00    | 399                   | 13520                   |          |        |        |         |
|           | FROM CULVERT SUMMARY |                       | 664                     | 603.61   |        |        |         |
|           | FROM PIPE SUMMARY    |                       | 783                     | 198.82   |        |        |         |
|           | TOTALS               | 5317                  | 261431                  | 1447     | 802.43 | 225.06 | 248 40  |
|           | BOOK NUMBER          | 1                     |                         |          |        |        |         |
|           | PAGE NUMBER          | 43                    |                         |          | 74     | 40     | 78 77   |

## FOR SURFACING

| GROSS LENGTH             | LIN. FT. | SQ. YDS. | MILES |
|--------------------------|----------|----------|-------|
| DEDUCTED FOR EQUATIONS   | 225060   |          |       |
| NET LENGTH               | 225060   | 450120   | 4.262 |
| NO DEDUCTIONS            |          |          |       |
| ADDED FOR CURVE WIDENING |          | 25350    |       |
| TOTAL SURFACING          |          | 475470   |       |

## SURFACING QUANTITIES CREEK GRAVEL

| UNIT         | QUANTITY | FOR ROADWAY | FOR ENTRANCE | FOR BRIDGES |
|--------------|----------|-------------|--------------|-------------|
| CREEK GRAVEL | TONS     | 11063.02    | 405.90       | 33.06       |

## BRIDGE SUMMARY

| SHEET NO. | STATION                    | SIZE                 | SKEN | CONCRETE CLASS | STEEL REINFORCEMENT | EXCAV. UNCL. | ELEVATIONS         | DWG NO. | STD OR SPCL. | BOOK | PAGE |
|-----------|----------------------------|----------------------|------|----------------|---------------------|--------------|--------------------|---------|--------------|------|------|
|           | UNIT                       |                      |      | CU YD          | LB                  | CU YD        | GRADE INLET OUTLET |         |              |      |      |
| 5         | 1326+00                    | 100' 12" x 12" x 92" | 45°  | 491.70         | 58030               | 237          | 9459 8913 8906     | 7132    | Spcl         | 4    | 24   |
| 9         | 1445+20                    | 100' 8" x 8" x 88"   | 45°  | 25980          | 28320               | 198          | 10079 9905 9871    | 7135    | "            | 4    | 63   |
|           | STEEL TO REPLACE TEST BARS |                      |      |                | 331                 |              |                    |         |              | 5    | 15   |
|           | TOTALS                     |                      |      | 75150          | 86681               | 435          |                    |         |              |      |      |

## CULVERT SUMMARY

| SHEET NO. | STATION                    | SIZE            | SKEN | CONCRETE CLASS | STEEL REINFORCEMENT | EXCAV. UNCL. | ELEVATIONS         | DWG NO. | STD OR SPCL. | BOOK | PAGE |
|-----------|----------------------------|-----------------|------|----------------|---------------------|--------------|--------------------|---------|--------------|------|------|
|           | UNIT                       |                 |      | CU YD          | LB                  | CU YD        | GRADE INLET OUTLET |         |              |      |      |
| 4         | 1291+21                    | 3' x 3' x 50'   |      | 2294           | 2273                | 34           | 90643 8982 8929    | C 11    | Std          | 4    | 6    |
| 5         | 1307+61                    | 4' x 4' x 58'   |      | 3806           | 3054                | 49           | 91570 9030 8975    | C 20    | "            | 4    | 17   |
| 6         | 1335+86                    | 2' x 2' x 31'   |      | 1375           | 1240                | 62           | 97072 9612 9630    | C 5     | "            | 4    | 27   |
| 6         | 1357+74                    | 2' x 2' x 74'   |      | 2895           | 2703                | 59           | 114376 11356 11165 | 7133    | Spcl         | 4    | 33   |
| 7         | 1367+45                    | 2' x 2' x 89'   |      | 3167           | 3213                | 64           | 12244 1202 11952   | C 5     | Std          | 4    | 37   |
| 7         | 1378+20                    | 10' x 8' x 129' | 45°  | 31380          | 31570               | 214          | 12398 11967 11936  | 7134    | Spcl         | 4    | 41   |
| 8         | 1413+85                    | 4' x 4' x 109'  | 30°  | 7700           | 7780                | 62           | 114675 11236 11140 | 7133    | "            | 4    | 51   |
| 10        | 1472+75                    | 5' x 4' x 66'   | 30°  | 5000           | 4090                | 64           | 96161 9500 9415    | C 30    | Std          | 5    | 1    |
| 10        | 1473+57                    | 2' x 2' x 75'   |      | 2744           | 2771                | 56           | 96274 9458 9418    | C 5     | "            | 5    | 3    |
|           | STEEL TO REPLACE TEST BARS |                 |      |                | 222                 |              |                    |         |              | 5    | 16   |
|           | TOTALS                     |                 |      | 603.61         | 618.82              | 664          |                    |         |              |      |      |

## PIPE SUMMARY

| SHEET NO. | STATION  | PIPE 15" CL. C.M. ENTRANCE | CONCRETE CLASS | EXCAV. UNCL. | REMARKS             | BOOK | PAGE |
|-----------|----------|----------------------------|----------------|--------------|---------------------|------|------|
|           | UNIT     | LIN. FT.                   | CU YD          | CU YD        | TYPE HDWL           |      |      |
|           | 1274+50  | 39'                        | 405            | 5            | 1 Ell 15id 1 Anchor | 4    | 1    |
|           | 1276+68  | 39'                        | 302            | 4            | 2 Std               | 4    | 2    |
|           | 1277+75  | 48'                        | 314            | 7            | 1 Ell 15id          | 4    | 3    |
|           | 1282+00  | 33'                        | 416            | 20           | 1 " 1 "             | 4    | 4    |
|           | 1287+036 | 36'                        | 400            | 6            | 2 Std               | 4    | 5    |
| 4         | 1289+93  | 39'                        | 402            | 6            | 2 Std               | 4    | 5    |
|           | 1293+46  | 27'                        | 314            | 10           | 1 Ell 15id          | 4    | 8    |
|           | 1295+05  | 30'                        | 314            | 12           | 1 " 1 "             | 4    | 10   |
|           | 1296+61  | 75'                        | 400            | 16           | 2 Std               | 4    | 11   |
|           | 1299+07  | 90'                        | 393            | 18           | 2 Std 1 Anchor      | 4    | 12   |
|           | 1300+79  | 30'                        | 416            | 16           | 1 Ell 15id          | 4    | 13   |
|           | 1302+70  | 30'                        | 416            | 18           | 1 " 1 "             | 4    | 15   |
|           | 1305+50  | 36'                        | 400            | 25           | 2 Std               | 4    | 16   |
|           | 1309+27  | 33'                        | 314            | 12           | 1 Ell 15id          | 4    | 19   |
| 5         | 1312+47  | 60'                        | 400            | 17           | 2 Std               | 4    | 20   |
|           | 1315+83  | 75'                        | 400            | 22           | 2 " "               | 4    | 21   |
|           | 1320+35  | 54'                        | 400            | 26           | 2 " "               | 4    | 22   |
|           | 1321+50  | 48'                        | 400            | 13           | 2 " "               | 4    | 23   |
|           | 1339+95  | 30'                        | 470            | 21           | 1 Ell 1 Rsd         | 4    | 29   |
|           | 1344+00  | 53'                        | 416            | 22           | 1 Ell 1 Std         | 4    | 30   |
| 6         | 1347+50  | 96'                        | 349            | 41           | 1 " 1 "             | 4    | 31   |
|           | 1353+792 | 30'                        | 416            | 19           | 1 " 1 "             | 4    | 32   |
|           | 1360+08  | 30'                        | 314            | 12           | 1 " 1 "             | 4    | 35   |
|           | 1362+50  | 30'                        | 416            | 21           | 1 " 1 "             | 4    | 36   |
|           | 1375+50  | 42'                        | 261            | 12           | 1 " 1 "             | 4    | 39   |
|           | 1375+97  | 12'                        | 045            | 2            | 1 Spr Bar 1 Anchor  | 4    | 40   |
| 7         | 1375+87  | 45'                        | 302            | 6            | 2 Std               | 4    | 43   |
|           | 1386+45  | 30'                        | 400            | 9            | 2 " "               | 4    | 44   |
|           | 1391+50  | 36'                        | 314            | 11           | 1 Ell 1 Std         | 4    | 45   |
|           | 1394+50  | 48'                        | 314            | 15           | 1 " 1 "             | 4    | 46   |
|           | 1399+00  | 36'                        | 314            | 18           | 1 " 1 "             | 4    | 47   |
|           | 1403+00  | 33'                        | 314            | 13           | 1 " 1 "             | 4    | 48   |
|           | 1405+70  | 42'                        | 314            | 11           | 1 " 1 "             | 4    | 49   |
| 8         | 1408+7   | 30'                        | 314            | 11           | 1 " 1 "             | 4    | 50   |
|           | 1418+30  | 36'                        | 314            | 14           | 1 " 1 "             | 4    | 53   |
|           | 1420+65  | 30'                        | 314            | 14           | 1 " 1 "             | 4    | 54   |
|           | 1423+00  | 30'                        | 314            | 9            | 1 " 1 "             | 4    | 55   |
|           | 1424+80  | 63'                        | 302            | 7            | 2 Std               | 4    | 56   |
|           | 1425+97  | 48'                        | 302            | 13           | 2 " "               | 4    | 57   |
|           | 1430+12  | 33'                        | 261            | 13           | 1 Ell 1 Std         | 4    | 58   |
|           | 1434+50  | 39'                        | 314            | 10           | 1 " 1 "             | 4    | 59   |
| 9         | 1437+81  | 30'                        | 314            | 12           | 1 " 1 "             | 4    | 60   |
|           | 1438+90  | 45'                        | 470            | 17           | 1 " 1 Rsd           | 4    | 61   |
|           | 1443+00  | 48'                        | 393            | 4            | 2 Std 1 Anchor      | 4    | 62   |
|           | 1448+20  | 30'                        | 314            | 13           | 1 Ell 1 Std         | 4    | 65   |
|           | 1454+35  | 42'                        | 314            | 10           | 1 " 1 "             | 4    | 66   |
|           | 1457+89  | 30'                        | 314            | 16           | 1 " 1 "             | 4    | 67   |
|           | 1460+99  | 54'                        | 365            | 8            | 1 Ell 15id 1 Anchor | 4    | 68   |
| 10        | 1464+00  | 54'                        | 344            | 19           | 2 Std 1 "           | 4    | 69   |
|           | 1467+35  | 45'                        | 353            | 10           | 2 " 1 "             | 4    | 70   |
|           | 1480+00  | 63'                        | 533            | 9            | 2 " 1 "             | 5    | 5    |
|           | 1483+51  | 45'                        | 314            | 14           | 1 Ell 1 Std         | 5    | 6    |
|           | 1485+50  | 48'                        | 314            | 13           | 1 " 1 "             | 5    | 7    |
| 11        | 1489+50  | 36'                        | 314            | 13           | 1 " 1 "             | 5    | 8    |
|           | 1492+00  | 33'                        | 314            | 16           | 1 " 1 "             | 5    | 9    |
|           | 1494+98  | 42'                        | 314            | 8            | 1 " 1 "             | 5    | 10   |
|           | 1499+30  | 57'                        | 400            | 24           | 2 Std               | 5    | 11   |
|           | 1476+927 | 198.82                     |                |              |                     |      |      |

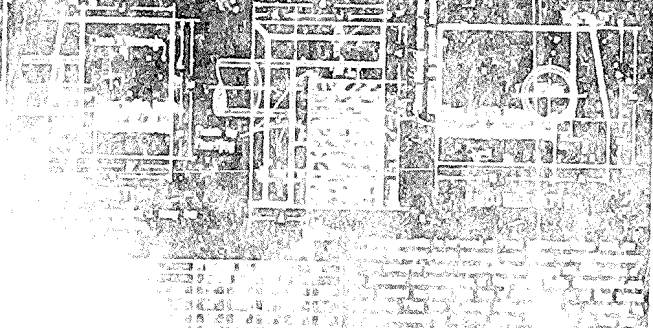
## STANDARD CONCRETE HEADWALL 31 PLATE 2



**MASONRY HEADWALL** **PLATE 31**

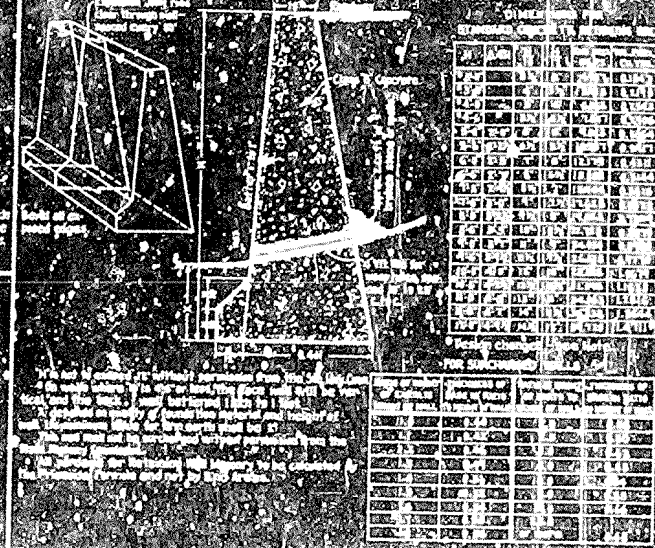


CONCRETE - ALL HEADWALL PLATE 30

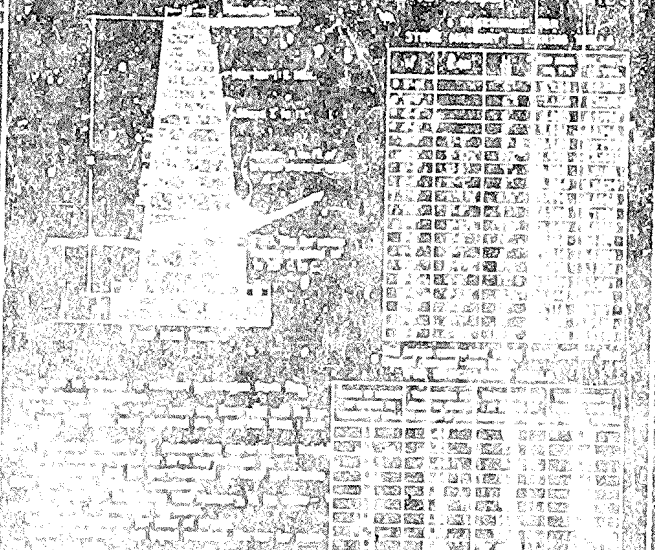


# STANDARD DRAWINGS

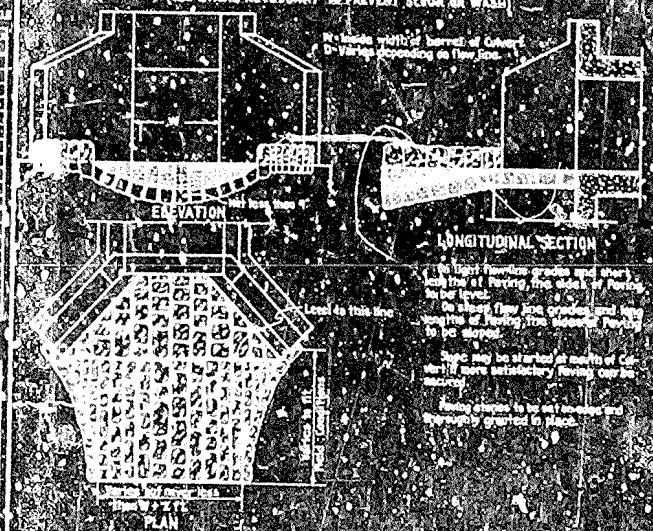
## CONCRETE RETAINING WALL



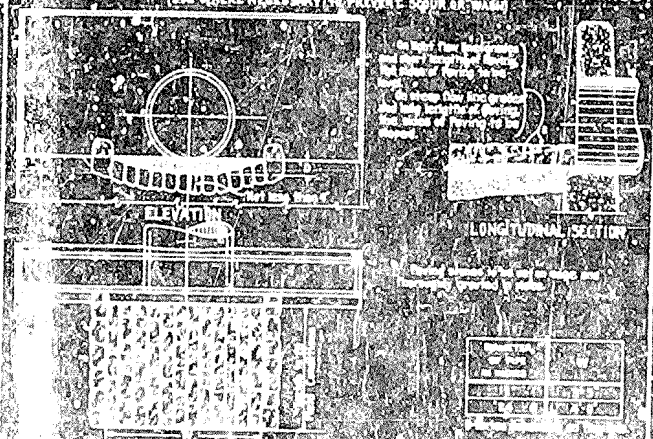
## STONE MASONRY RETAINING WALL



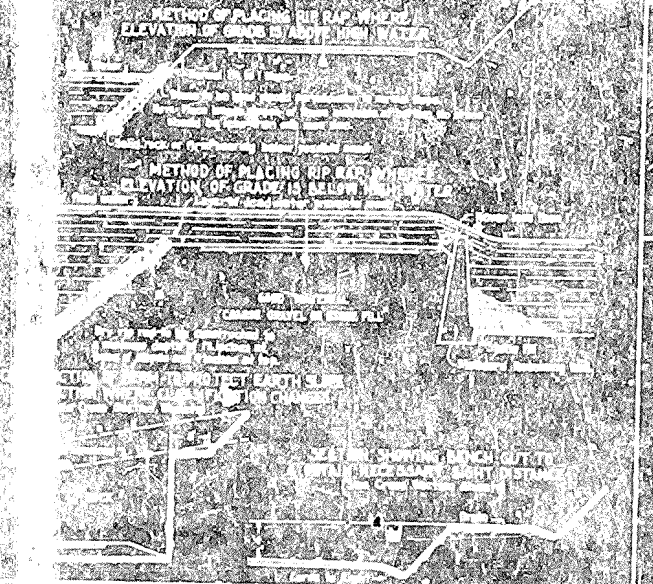
## STONE PAVING FOR BOX CULVERT OUTLETS



## STONE PAVING FOR PIPE COLVERT OUTLETS



## RIP RAP



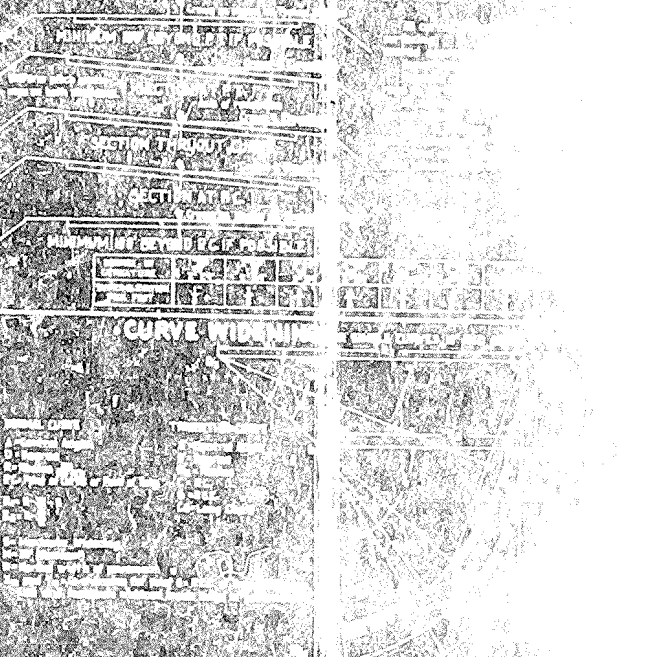
## ALTERNATE CO



ON EARTH FOUNDATION



## SUPER-ELEVATION













1337-10.1 Box  
1337-10.2 Box



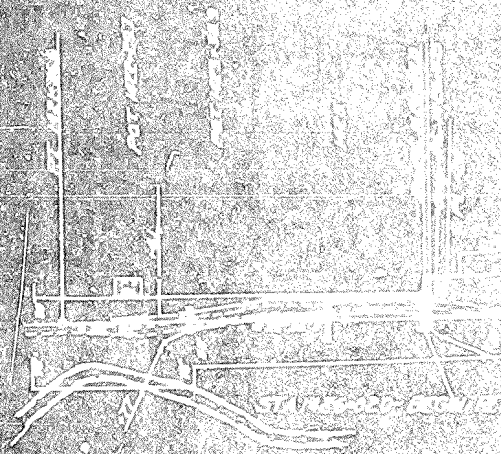




This is a detailed black and white map of the Fort Belknap Reservation in Montana. The map shows the Fort Belknap River flowing through the center, with several towns and landmarks marked. Key locations include Fort Belknap, Fort Belknap River, and various smaller settlements. The map also shows the surrounding terrain, including hills and valleys. A scale bar is located in the bottom right corner, and a north arrow is in the bottom left corner. The map is titled "Fort Belknap Reservation, Montana" at the top.

S F 631

LOW HANGING





EDWIN HARRARD  
(1910)  
MRS. MARY HARRARD  
(1910)  
MRS. POLLY HARRARD  
(1910)

Sta 1426+00.0  
Begin Revision

EQUATION  
STA 1425+710 EX-  
STA 1435+704 END  
End Revision





|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |     |
|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |
|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|



12

**ELINO MOSLE**

Full Construction  
 100% of the cost of the  
 building, including the  
 cost of the land.

SP 531

# Appendix F

## - FIRM Maps of Study Area -



# NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

**Coastal Base Flood Elevations** shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Kentucky State Plane (FIPSZONE 1600). The **horizontal datum** was NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of the FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic

## LEGEND



### SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

- ZONE A** No Base Flood Elevations determined.
- ZONE AE** Base Flood Elevations determined.
- ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- ZONE AR** Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- ZONE A99** Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
- ZONE V** Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- ZONE VE** Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.



### FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.



### OTHER FLOOD AREAS

- ZONE X** Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.



### OTHER AREAS

- ZONE X** Areas determined to be outside the 0.2% annual chance floodplain.
- ZONE D** Areas in which flood hazards are undetermined, but possible.



### COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS



### OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% annual chance floodplain boundary

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at [www.msc.fema.gov](http://www.msc.fema.gov)

and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at <http://www.ngs.noaa.gov/> or contact the National Geodetic Survey at the following address:

NGS Information Services  
NOAA, N/NGS12  
National Geodetic Survey  
SSMC-3, #9202  
1315 East-West Highway  
Silver Spring, MD 20910-3282

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242**, or visit its website at <http://www.ngs.noaa.gov/>.

**Base map** Information shown on this FIRM was derived from the U.S.D.A Farm Service Agency National Imagery Program (NAIP) produced at a scale of 1:12,000 from photography dated 2004 or later.

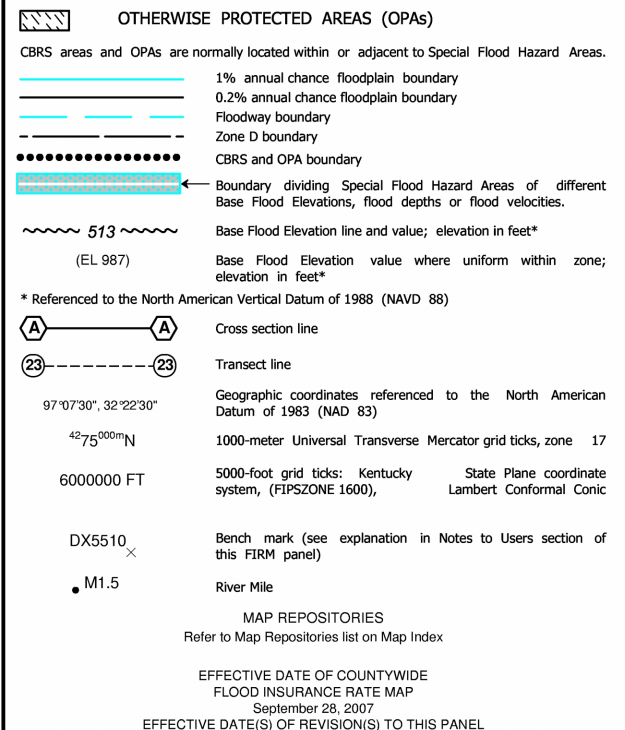
This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the *Flood Insurance Study report (which contains authoritative hydraulic data)* may reflect stream channel distances that differ from what is shown on this map.

**Corporate limits** shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a *Flood Insurance Study report*, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and its website at <http://www.msc.fema.gov/>.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA MAP** (1-877-336-2627) or visit the FEMA website at <http://www.fema.gov/>.



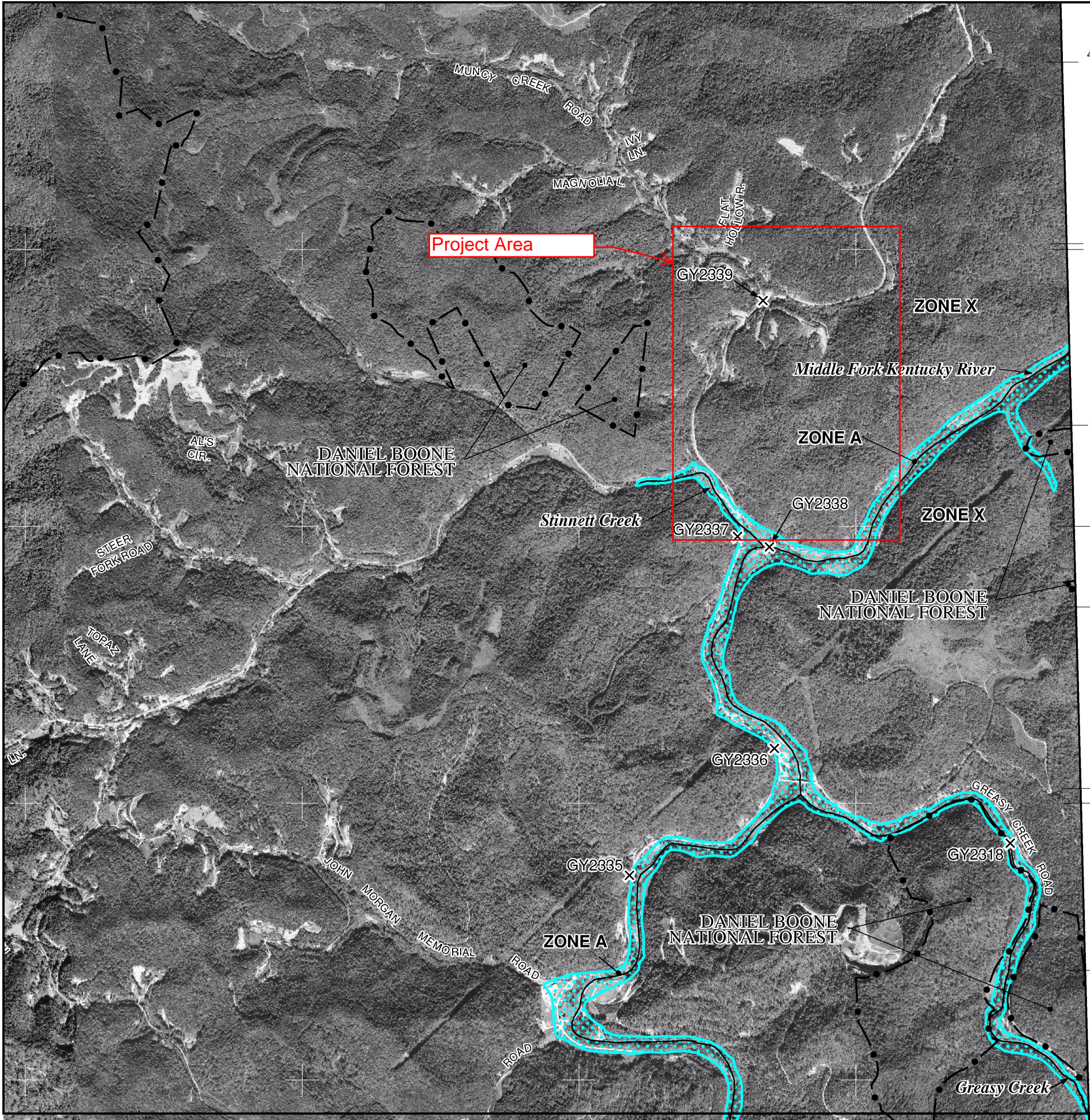
For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.


To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.



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**MAP SCALE 1" = 2000'**

1000 0 2000 4000 FEET

**NFIP**

**PANEL 0200D**

**FIRM**

**FLOOD INSURANCE RATE MAP**

**LESLIE COUNTY, KENTUCKY**


**AND INCORPORATED AREAS**

**PANEL 200 OF 350**  
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

**CONTAINS:**

| COMMUNITY     | NUMBER | PANEL | SUFFIX |
|---------------|--------|-------|--------|
| LESLIE COUNTY | 210324 | 0200  | D      |

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.



**MAP NUMBER**  
**21131C0200D**

**EFFECTIVE DATE**  
**SEPTEMBER 28, 2007**

Federal Emergency Management Agency

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# Appendix G

## -Photographs -

