U.S. HIGHWAY 63

CORRIDOR LOCATION STUDY

FINAL REPORT

JULY 2013

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Executive Summary

Study Background

In 2009, The East Central Iowa Transportation Coalition was formed to identify transportation demands and promote transportation improvements in the East Central Iowa area. Snyder & Associates, Inc. was selected to provide professional engineering expertise towards the completion of a study to determine the specific demands of the region. In January 2011, a report of the U.S. 63 Area Transportation Study was completed. The report concluded that U.S. Highway 63 Improvements between Iowa Highway 163 and U.S. Highway 6 should be considered the highest priority in the region, as compared to improvements on Iowa Highway 21, U.S. Highway 34, Iowa Highway 92, and Iowa Highway 146. Upon coordination with the Iowa Department of Transportation (DOT), it was determined the U.S. Highway 63 Corridor Location Study should be the next step.

In 2011 the U.S. Highway 63 Corridor Location Study was started and involved further development of the purpose and need for roadway improvements throughout the corridor. The study was conducted as a pre-NEPA (National Environmental Policy Act) phase for the entire corridor from U.S. Highway 163 at Oskaloosa to U.S. Highway 6 north of Malcom. The intention of the study was to provide a preliminary overview of potential impacts for further study when individual NEPA studies are contemplated for improvements on smaller segments of the corridor.

The ultimate purpose of the U.S. Highway 63 Corridor Location Study is to evaluate route alternatives based on their fulfillment of the purpose and need and their impacts on the environment.

The corridor location study considers long-term transportation improvements that would correct functional issues and add capacity to U.S. Highway 63 in Mahaska and Poweshiek Counties in Iowa, between Iowa Highway 163 south of Oskaloosa to U.S. Highway 6 near Malcom, bringing the highway up to current engineering standards and modernizing the roadway to accommodate future traffic needs.

Purpose and Need

Purpose of the Proposed Action

The purpose of the proposed action is to improve the safety, efficiency, and effectiveness of the U.S. Highway 63 corridor between Iowa Highway 163 at Oskaloosa and U.S. Highway 6 near Malcom as a regional and national transportation route. Specifically within the East Central Iowa region, the purpose of U.S. Highway 63 is to provide a north-south transportation corridor that also connects economic growth centers with Interstate 80 for eastbound travel.

Need for the Proposed Action

The need for the proposed improvements to the U.S. Highway 63 corridor is based on a combination of factors related to providing better transportation service and sustaining economic development. The proposed action is intended to meet the following needs:

Safety

- The vertical and horizontal alignments do not meet current primary road design standards, particularly for highways in hilly terrain with a high percentage of truck traffic.
- Crash rates are approximately 36% greater than the statewide average on U.S. Highway 63 between Oskaloosa and U.S. Highway 6. Crashes are recorded uniformly along the corridor; many can be attributed to outdated road design and alignment. Safety concerns also include presence of slow moving vehicles and lack of passing opportunities.

Travel Efficiency

- Projected traffic – The U.S. 63 Area Transportation Study reported that U.S. Highway 63 was among the fastest-growing regional routes in East Central Iowa from 1986 to 2006. According to traffic modeling completed by the Iowa DOT, U.S. Highway 63 can be expected to carry approximately 5,000-7,000 vehicles per day by 2035. In rolling terrain, this volume warrants consideration of expansion to a four lane highway.
- Travel time – The current route of U.S. Highway 63 carries traffic through the heart of Oskaloosa, New Sharon, Montezuma, and Malcom. In each town, speed is reduced and there are stop situations in Oskaloosa and New Sharon. This causes an increase in travel time and reduces the efficiency of the highway as a freight route.
- Speed constraints – In addition to the speed reduction through town, the prevailing speed on rural sections of the highway is also reduced by the number of slow moving vehicles and inability to pass in hilly terrain.
- Pavement condition – While much of U.S. Highway 63 has been resurfaced in recent years, the remainder of the route has continued to deteriorate. Deteriorated pavement can add to the user cost of maintenance as it increases vehicle wear and tear.

Regional Connections and Route Significance

Currently there is a need for an improved major trucking route through the South Central region of Iowa and Central Missouri. There are currently two major north/south freight routes through the State of Iowa that connect Kansas City and St. Louis to St. Paul: Interstate 35 and the Avenue of the Saints. These two highway systems travel on the east and west sides of Missouri. This allows for easy access to an interstate system for the industries along those routes, but leaves a void in the region between the routes. The U.S. Highway 63 corridor is ideal to fill this void as the north/south trucking artery between I-35 and the Avenue of the Saints. U.S. Highway 63 goes through or is near the major industrial manufacturing towns in the South Central Region of Iowa and travels through major towns in Central Missouri such as Kirksville, Macon, Columbia, and Jefferson City.

Traffic Projection

The Iowa DOT Office of Systems Planning initially provided traffic modeling outputs for consideration. The iTRAM model uses historic traffic volumes as well as variables such as population numbers, community socioeconomic factors, land use, and roadway variables. This analysis provided Year 2035 projections.

For this corridor location study it is assumed that an improved U.S. Highway 63 would attract traffic in a manner not simply attributed to normal traffic growth. Improved pavement condition, horizontal and vertical alignments, and capacity will improve travel time and road experience and attract more traffic. In 2012, Iowa DOT Office of Systems Planning provided an updated iTRAM analysis with many of the "constraints" to the U.S. Highway 63 corridor removed (e.g. two-lane capacity changed to four lane, speed limit increased to 65 mph, etc). This analysis provided potential Year 2040 volumes with these long term corridor improvements. A summary of traffic data is provided in the table bellow.

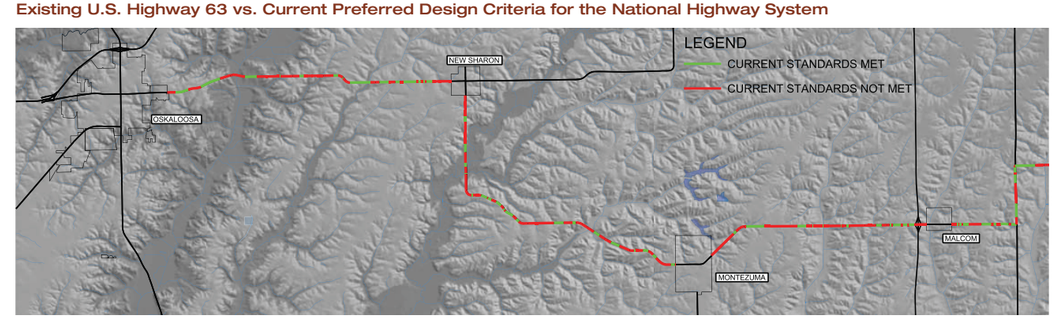
U.S. Highway 63 Corridor Segment	Iowa DOT Year 2010 Annual Daily Traffic (AADT) (Veh/day)	Projected Year 2040 Annual Daily Traffic (AADT) (Veh/day)
Oskaloosa to New Sharon	3000	7500
New Sharon to Montezuma	1350	6000
Montezuma to Interstate 80	2600	7500
Interstate 80 to U.S. Highway 6	2500	5800

U.S. Highway 63 Crash Rates for Rural Segments

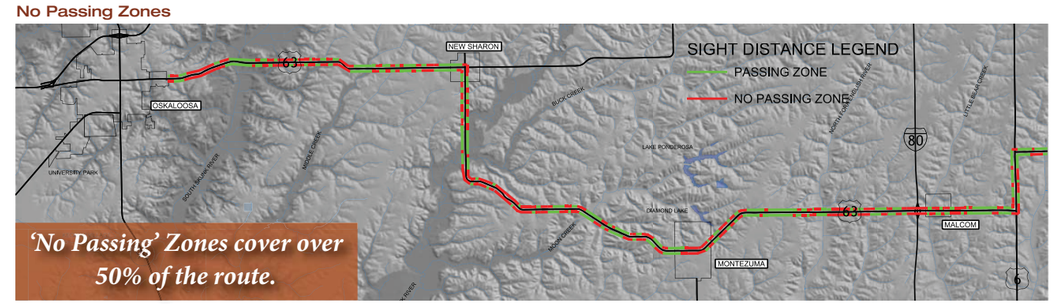
U.S. Highway 63 Corridor Segment	'10 Traffic Volume (AADT)	'07-'11 Crashes	Segment Length (mi)	'07-'11 Crash Rate (cr/HMVM)	'07-'11 Fatal+Inj Crash Rate (cr/HMVM)
Oskaloosa to New Sharon	3100	64	10	113	55
New Sharon to Montezuma	1400	33	11.5	112	44
Montezuma to Interstate 80	2800	41	7.5	107	21
Interstate 80 to U.S. Highway 6	2500	27	3.5	169	63
			Statewide Average	92	26

The crash rate within the City of Oskaloosa is 20% higher than the statewide average for urban areas.

Existing U.S. Highway 63 vs. Current Preferred Design Criteria for the National Highway System



No Passing Zones



'No Passing' Zones cover over 50% of the route.

Process Toward an Ultimate Corridor

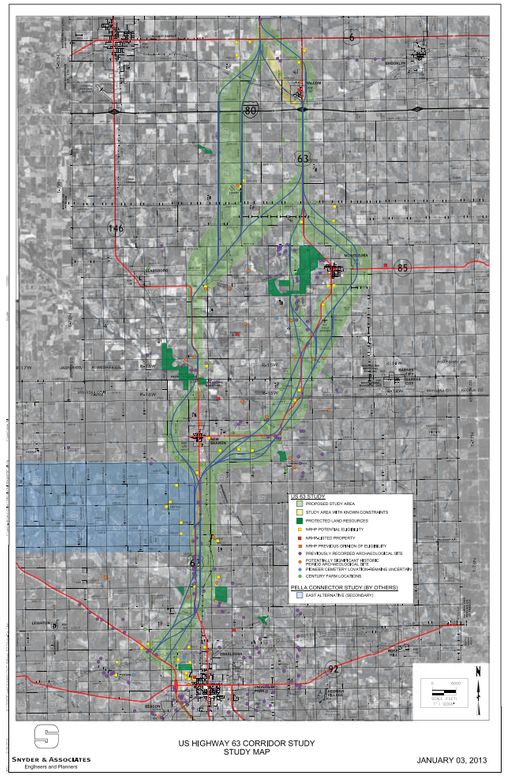
Alternatives Evaluation

To accomplish the ultimate purpose of the U.S. Highway 63 Corridor Location Study, it is necessary to evaluate each of the alternatives that have been identified. In addition to the primary goals introduced in Section 2.5 of the U.S. Highway 63 Corridor Location Study Report, there are several criteria that can be compared between alternatives. To evaluate the alternatives with each criteria, there are a number of factors that should be considered for a transportation facility. For this Corridor Location Study, the factors included roadway characteristics as well as environmental impacts associated with the NEPA process. The pre-NEPA factors were not studied in great detail to determine actual impacts, but rather broadly reviewed to highlight potential impacts for further study as improvements are planned and designed.

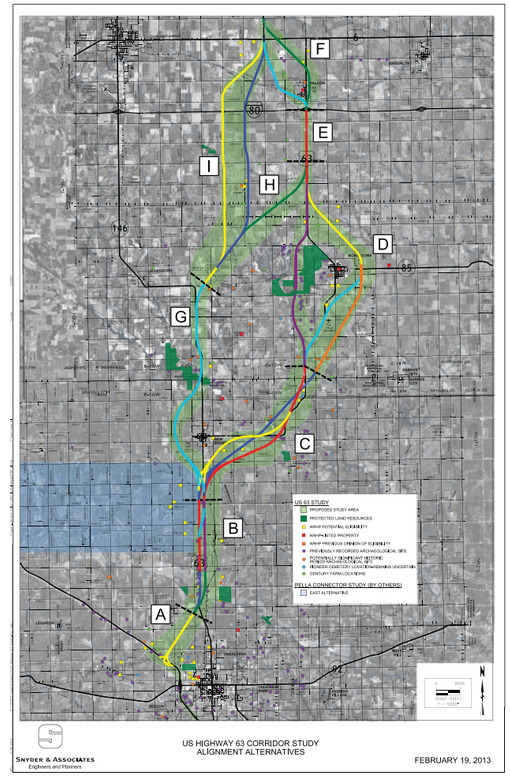
The U.S. Highway 63 steering committee also provided input on the factors considered most important for this corridor. Those factors are emphasized in the list below.

Criteria

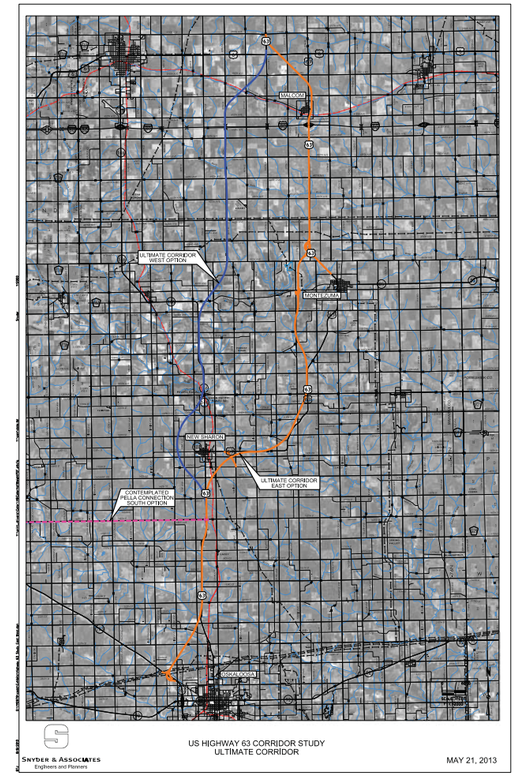
- **Route Performance**
  - ***Time of Travel***
  - ***Highway Speed Maintained***
  - ***Out of Distance Travel***
  - Annual User Cost for Out-of-Distance Travel
- **Economic Vitality**
  - ***Economic Development***
  - Local Road Network Impact
  - Regional Connectivity
  - Intermodal Opportunities
- **Economic Consequences**
  - Diagonal Severance
  - Land Use Impact
  - Relocations (Residential and Commercial)
  - Energy Consumption
  - Agriculture
- **Fundability**
  - ***Construction Cost***
  - ***Phased Improvement Opportunities***
  - Connectivity to Existing ROW
- **Societal Impact**
  - ***Proximity to US 63***
  - ***Avoidance of Century Farms***
  - Conflict Points/Predicted Safety
  - Community Impacts
  - Environmental Justice
  - Visual Impacts
  - Air Quality
  - Noise
  - Regulated Material
  - Cultural Resources
- **Natural Environmental Impacts**
  - Surface Water/Water Quality
  - Wetlands
  - Special River Designations
  - Floodplains/Hydraulics
  - Threatened & Endangered Species
  - Section 4(f) Property



January 3, 2013 Study Map



February 19, 2013 Alignment Alternatives



May 21, 2013 Ultimate Corridor

Method of Evaluation

The criteria and factors listed previously created the foundation for evaluating the alternatives. Every factor was assigned a metric that would be used to compare the alternatives against each other. A weight was also assigned to each factor to illustrate its importance in the overall evaluation. Once the metrics were computed for each factor, the alternatives were given a rank, based on how they compared with the other alternatives. This rank was then multiplied by the weight to establish a score for that factor. A summation of the scores for each alternative was calculated and provides the basis for the final evaluation results.

The evaluation was first done by segment, to determine the best overall alignment created by combining the segments.

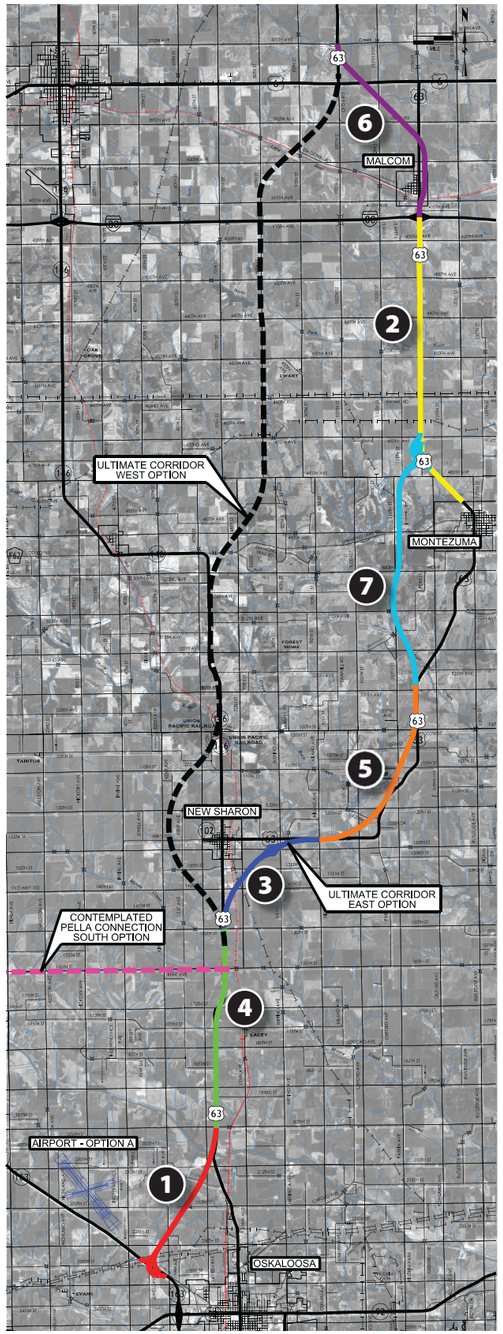
The segment evaluation concluded with a determination of the preferred West Alignment Option and the preferred East Alignment Option, as shown on the Ultimate Corridor Map.

Ultimate Corridor

The east and west corridor options were then compared using the same criteria and scoring method used to evaluate the segments. The two options were relatively equal in scoring, so other factors were reviewed and discussed with the affected entities to determine a single "Ultimate Corridor" for future planning and development.

Two major factors influence the determination of the east option as the Ultimate Corridor. First, an early emphasis on following the existing U.S. Highway 63 corridor as much as possible was found to yield a better potential for interim improvements toward the final goal of a fully updated facility. The second factor was the social and economic impact of retaining the existing route. Numerous existing businesses and their future planning is dependent on the proximity of U.S. Highway 63.

Priority Improvements



U.S. Highway 63 Ultimate Corridor Priorities

Priority 1

U.S. Highway 63 Oskaloosa NW Bypass

The largest inhibitor to the use and effectiveness of U.S. Highway 63 in the study area is the portion of the route through the City of Oskaloosa. U.S. Highway 63 maintains its original route through the City's historic downtown square, through a tight, downtown intersection with Iowa Highway 92. Accommodation of freight traffic, in particular, is troublesome in this area.

The envisioned U.S. Highway 63 Bypass will utilize much of existing Iowa Highway 163 (part of the Des Moines to Burlington expressway corridor) to bypass Oskaloosa to the west. North of the existing Iowa Highway 163 and Iowa Highway 92 interchange, a new interchange is proposed to divert U.S. Highway 63 traffic on a new alignment roadway to reconnect to existing U.S. Highway 63 north of Oskaloosa.

Proposed Construction: Construct full interchange at U.S. Highway 63 and Iowa Highway 163. Configure interchange to accommodate ultimate 4-lane section. The cross section must reduce to 2-lanes at existing U.S. Highway 63 north of Oskaloosa. The constructed mainline capacity through the length of the bypass should be determined based on design level traffic projections during the NEPA or preliminary design process. Oskaloosa anticipates development pressure in that quadrant of the City, particularly given proximity of U.S. Highway 63, Iowa Highway 163 and the proposed regional airport.

Proposed Right of Way: Acquire right of way width suitable for a 4-lane expressway.

Order of Magnitude Total Project Cost **$25,100,000**

Priority 2

Functional and structural improvements of U.S. Highway 63 from Montezuma to Interstate 80, and corridor preservation activities for a future U.S. Highway 63 Montezuma Bypass.

The analysis toward a preferred "Ultimate Build" improvement of U.S. Highway 63 yielded two viable alternative alignments, an east alignment using much of the existing U.S. Highway 63 general route, and a west alignment following a portion of Iowa Highway 146, then new alignment north to Interstate 80 and U.S. Highway 6.

The key factor which makes the east alignment along existing U.S. Highway 63 viable is the future consideration of an available bypass corridor around Montezuma. If no corridor is available, the west alignment option following Iowa Highway 146 is preferred. Additional study of the bypass route with significant public input is proposed, along with corridor preservation activities of the desired location.

The segment of existing U.S. Highway 63 from Montezuma to Interstate 80 exhibits the most severe pavement distress remaining in the corridor. In addition, the segment has been studied for other functional and safety concerns. Near term structural improvements to this segment are needed, and emphasis should be given to functional and safety improvements. Consideration of improvements toward a "super two" facility would be long lasting toward an appropriate level of service for the future.

Proposed Construction: Overlay or replacement of existing pavement. Strong consideration should be given to super-two improvements to correct geometric and sight distance deficiencies. New construction required at the reverse curves per current design standards.

Proposed Right of Way: Corridor preservation activities are proposed for a future Montezuma bypass. Activities can include acquisitions of opportunity, with diligence in zoning and development to preserve the existing corridor. For the segment from Montezuma to Interstate 80, consideration should be given to acquire right of way for a future 4-lane expressway as right of way for the current construction is explored.

Order of Magnitude Total Project Cost **$21,980,000**

Priority 3

U.S. Highway 63 New Sharon Bypass

Another significant functional constriction on existing U.S. Highway 63 is the right angle turn intersection with Iowa Highway 146 in New Sharon. Freight traffic attempting to make the turn in downtown New Sharon is restricted by available space, particularly with other traffic, pedestrians, and on-street parking in proximity. With the potential for a future Montezuma Bypass secured as noted in Priority 2, the bypass alignment can occur southeast of New Sharon between portions of the existing U.S. Highway 63 corridor.

It is anticipated that the removal of the southern constriction on U.S. Highway 63 at Oskaloosa by the proposed U.S. Highway 63 Oskaloosa NW Bypass may create a more urgent need in New Sharon if traffic volume increases as predicted.

Proposed Construction: New highway on new alignment is proposed. Design capacity of the New Sharon bypass should be determined during the NEPA process and preliminary design phase.

Proposed Right of Way: Acquire right of way for a 4-lane expressway.

Order of Magnitude Total Project Cost **$14,180,000**

Priority 4

U.S. Highway 63 Improvements from Oskaloosa to New Sharon

U.S. Highway 63 north of Oskaloosa has the highest existing traffic counts of any portion of U.S. Highway 63 in the study area. This is partially due to the tendency of traffic to split between Iowa Highway 146 and U.S. Highway 63 at New Sharon, depending on destination. This trend would likely continue until U.S. Highway 63 is improved as a through route as part of the Commercial and Industrial Network, and National Highway System. As such, the traffic and safety needs are greater on this segment from Oskaloosa to New Sharon.

Proposed Construction: Opportunities include improvements to a super-two configuration, "have two, add two" construction for a 4-lane expressway or full 4-lane reconstruction based on the design level traffic projection at the time of project development.

Proposed Right of Way: As any of the above improvement requires right of way acquisition, acquire width suitable for a 4-lane expressway.

Order of Magnitude Total Project Cost **$17,310,000**

Priority 5

U.S. Highway 63 Improvements from New Sharon to Montezuma

This segment features the most antiquated geometry and vertical profile in the study area. Single vehicle accidents are predominant. Only 27% of this section meets current preferred design criteria. This section also has the least availability of passing zones. Increasing freight traffic would benefit significantly from geometric and capacity improvements.

Proposed Construction: New road on new alignment is required to accommodate current primary highway design standards. Super-two or 4-lane expressway construction can be determined by traffic projection at the time of project development. Consider interim improvements from the proposed bypass into Montezuma, depending on the anticipated timing of the bypass construction.

Proposed Right of Way: Acquire right of way suitable for a 4-lane expressway.

Order of Magnitude Total Project Cost **$26,790,000**

Priority 6

U.S. Highway 63 Improvements from Malcom (Interstate 80) to U.S. Highway 6

The improvement of route performance on U.S. Highway 63 does not end at Interstate 80 if the overall goal is to make U.S. Highway 63 a significant north-south transportation corridor consistent with the Commercial and Industrial Network and National Highway System designations. Improvements would include alignment adjustments to eliminate right angle intersection turns at U.S. Highway 6. An improved, through-movement corridor would enhance the ability of U.S. Highway 63 north of the study area to continue as an important freight corridor to Waterloo.

Proposed Construction: The slight, east bypass of Malcom shown on the map is problematic and without corridor preservation activities may be precluded in the future. Consideration should be given to capacity improvements from the interchange through the developed part of Malcom. New alignment is proposed north to existing U.S. Highway 63 at U.S. Highway 6.

Proposed Right of Way: Consider corridor preservation activities east of Malcom. Acquire right of way for a 4-lane expressway north of Malcom.

Order of Magnitude Total Project Cost **$20,990,000**

Priority 7

U.S. Highway 63 Montezuma Bypass Construction

Traffic along existing U.S. Highway 63 is not required to stop in Montezuma, although travel speed is reduced through the city. As the rest of U.S. Highway 63 is improved and traffic increases additional intersection controls may be required. Ultimately, a bypass of Montezuma is envisioned to the immediate west following a major utility corridor between Diamond Lake and Lake Ponderosa.

Proposed Construction: It is reasonable to assume that by the time the Montezuma bypass is warranted and programmed, new 4-lane construction is recommended.

Proposed Right of Way: Acquire remaining right of way needed for 4-lane expressway.

Order of Magnitude Total Project Cost **$60,750,000**

Priority 8

Improvement of all sections of U.S. Highway 63 to an "Ultimate Build" 4-lane expressway, access controlled corridor.

For the construction of each of the Priority projects mentioned above, it is assumed that design level traffic projections will be made to appropriately determine the capacity needs of the corridor, whether they be a "super two" configuration, or a full, 4-lane divided roadway. Traffic projections outlined in this study indicate the ultimate configuration should include four lanes. If a super-two facility is specified, right-of-way purchase should not preclude an ultimate 4-lane section.

Project Challenges

Slow moving vehicles on U.S. Highway 63 cause delays in hilly terrain.

Traffic speed on U.S. Highway 63 is reduced to 35 mph as it's routed through Oskaloosa.

Large vehicles traveling on U.S. Highway 63 create delays at intersections in town.

Conflicts between pedestrians and U.S. Highway 63 traffic are common in downtown Oskaloosa.

Project Challenges

U.S. Highway 63 serves significant freight traffic.

U.S. Highway 63 carries freight traffic through downtown Oskaloosa.

Traffic is slowed on U.S. Highway 63 due to farm and freight traffic on steep grades.

The profile of U.S. Highway 63 closely follows the rolling terrain of the East Central Iowa Area, therefore sight distance is limited and 'No Passing Zones' are numerous.

Study Background

In 2009, The East Central Iowa Transportation Coalition was formed to identify transportation demands and promote transportation improvements in the East Central Iowa region. Snyder & Associates, Inc. was selected to provide professional engineering expertise towards the completion of a study to determine the specific demands of the region. In January 2011, a report of the U.S. Highway 63 Area Transportation Study was completed. The report concluded that U.S. Highway 63 Improvements between Iowa Highway 163 and U.S. Highway 6 should be considered the highest priority in the region, as compared to improvements on Iowa Highway 21, U.S. Highway 34, Iowa Highway 92, and Iowa Highway 146. The Potential Areas of Study Map was first introduced in the U.S. Highway 63 Area Transportation Study Report. The green shaded area identified as the "North/South Alternative Corridors for U.S. Highway 63" provided the initial study area for the next phase of study. Upon coordination with the Iowa Department of Transportation (DOT), it was determined that this next phase would be considered the U.S. Highway 63 Corridor Location Study.

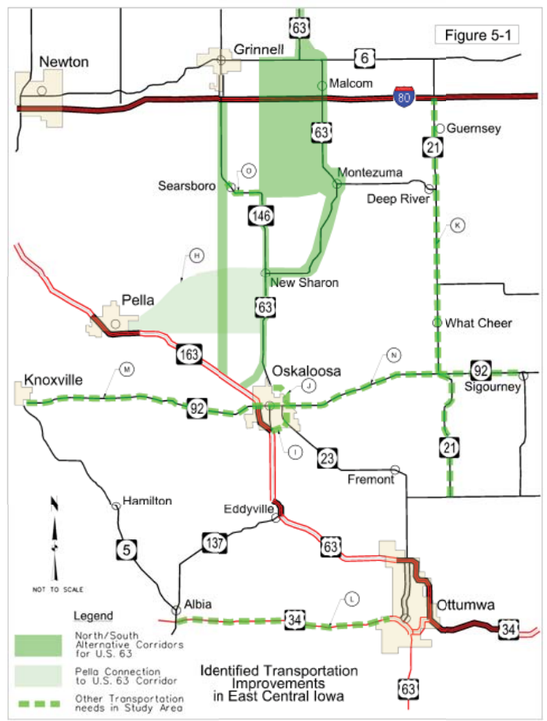
The U.S. Highway 63 Corridor Location Study involved further development of the purpose and need for roadway improvements throughout the corridor. The study was conducted as a pre-NEPA (National Environmental Policy Act) phase for the entire corridor from U.S. Highway 163 at Oskaloosa to U.S. Highway 6 north of Malcom, with the intention of providing a preliminary overview of potential impacts for further study when individual NEPA studies are contemplated for improvements on smaller segments of the corridor.

The ultimate purpose of the U.S. Highway 63 Corridor Location Study is to evaluate route alternatives based on their fulfillment of the purpose and need and their impacts on the environment. Recommendations will include identification of individual projects for further project development through the NEPA process, design, and programming.

1.1 Purpose and Need

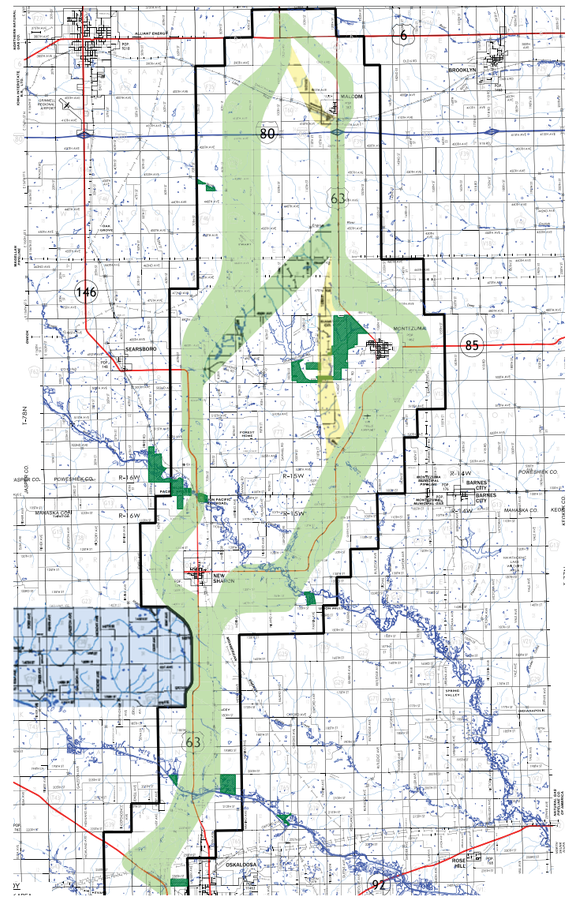
Purpose of the Proposed Action

The purpose of the proposed action is to improve the safety, efficiency, and effectiveness of the U.S. Highway 63 corridor between Iowa Highway 163 at Oskaloosa and U.S. Highway 6 near Malcom as a regional and national transportation route. Specifically within the East Central Iowa region, the purpose of U.S. Highway 63 is to provide a north-south transportation corridor that also connects economic growth centers with Interstate 80 for eastbound travel. The remainder of this section discusses the corresponding needs in detail.



Potential Areas of Study presented by the U.S. Highway 63 Area Transportation Study January, 2011

The corridor location study considers long-term transportation improvements that would correct functional issues and add capacity to U.S. Highway 63 in Mahaska and Poweshiek Counties in Iowa, between Iowa Highway 163 south of Oskaloosa to U.S. Highway 6 near Malcom, bringing the highway up to current engineering standards and modernizing the roadway to accommodate future traffic needs.



U.S. Highway 63 Corridor Location Study Area

Need for the Proposed Action

The need for the proposed improvements to the U.S. Highway 63 corridor is based on a combination of factors related to providing better transportation service and sustaining economic development. The proposed action is intended to meet the following needs:

Safety

- Crash rates are above the statewide average on the majority of the route between Oskaloosa and U.S. Highway 6. Many crashes can be attributed to outdated road design and alignment. Safety concerns also include presence of slow moving vehicles and lack of passing opportunities.
- The vertical and horizontal alignments do not meet current primary road design standards, particularly for highways with a high percentages of truck traffic.

Travel Efficiency

- Projected traffic – The U.S. Highway 63 Area Transportation Study reported that U.S. Highway 63 was among the fastest-growing regional routes in East Central Iowa from 1986 to 2006. According to traffic modeling completed by the Iowa DOT, U.S. Highway 63 can be expected to carry approximately 5,000-7,000 vehicles per day by 2035. In rolling terrain, this volume warrants consideration of expansion to a four lane highway.
- Travel time – The current route of U.S. Highway 63 carries traffic through the heart of Oskaloosa, New Sharon, Montezuma, and Malcom. In each town, speed is reduced and there are stop situations in Oskaloosa and New Sharon. This causes an increase in travel time and reduces the efficiency of the highway as a freight route.
- Speed constraints – In addition to the speed reduction through town, the prevailing speed on rural sections of the highway is also reduced by the number of slow moving vehicles and inability to pass in hilly terrain.

- Pavement condition – While much of U.S. Highway 63 has been resurfaced in recent years, the remainder of the route has continued to deteriorate. Pavement in this condition can add to the user cost of maintenance as it increases vehicle wear and tear.

Regional Connections and Route Significance

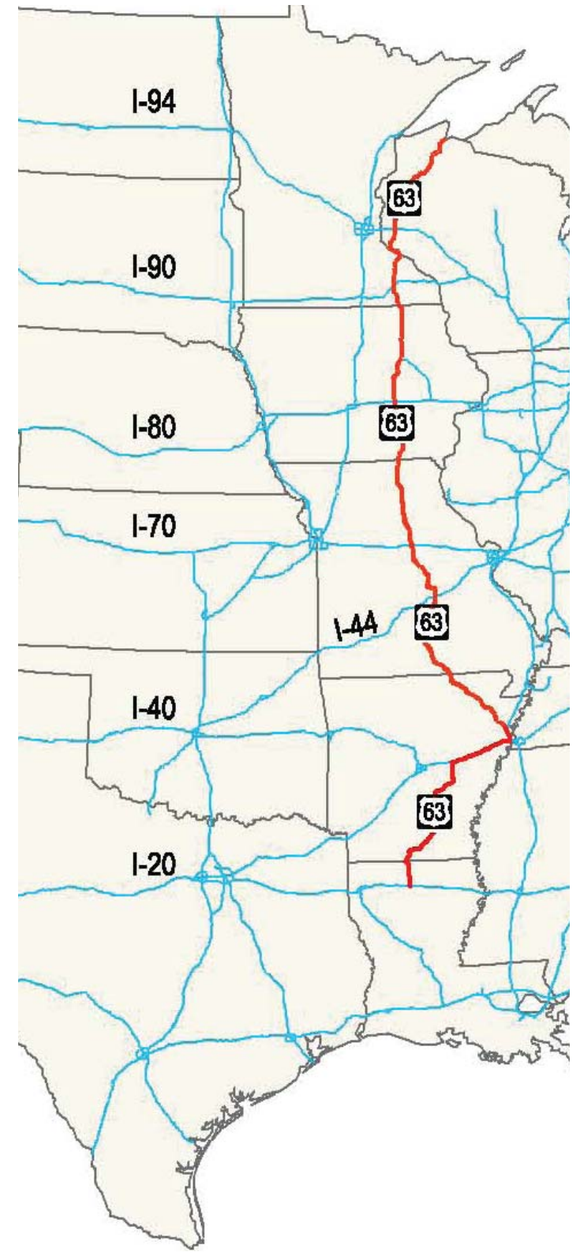
Currently there is a need for an improved major trucking route through the South Central Region of Iowa and the Central part of Missouri. There are currently two major north/south freight routes through the State of Iowa that connect Kansas City and St. Louis to St. Paul: Interstate 35 and the Avenue of the Saints. These two highway systems travel on the east and west sides of Missouri. This allows for easy access to an interstate system for the industries along those routes, but leaves a void in the region between the routes. Kansas City and St. Louis are separated along Interstate 70 by a distance of 248 miles. The two routes converge toward a single route north to Minneapolis/St. Paul just south of Clear Lake, IA.

The U.S. Highway 63 corridor is ideal to fill this void as the north/south trucking artery between Interstate 35 and the Avenue of the Saints. U.S. Highway 63 begins in Louisiana and ends in Wisconsin, see National U.S. Highway 63 Route. U.S. Highway 63 goes through or is near the major industrial manufacturing towns in the South Central Region of Iowa and travels through major towns in Central Missouri such as Kirksville, Macon, Columbia, and Jefferson City.

U.S. Highway 63 is a trucking route for important industrial businesses not along the interstate system. In 2005, the classification of roadways changed, and roadways were either classified as being part of the National Highway System or as Other Principal Routes. U.S. Highway 63 from Ottumwa to Waterloo was classified as a Principal Route. On August 12, 2012, the State of Iowa added U.S. Highway 63 from Ottumwa to Waterloo to the Commercial and Industrial Network (CIN), which also added U.S. Highway 63 to the National Highway System.

Portions of the U.S. Highway 63 corridor between Jefferson City, Missouri and Rochester, Minnesota have been improved with updated alignments and safety updates to better facilitate interstate travel and freight movement. These updates have not been made on the portion of the route in Iowa between Oskaloosa and Waterloo. Transportation improvements would provide a link in the system to allow the corridor to function more appropriate to current travel demands; as a safe and efficient route for interstate travel.

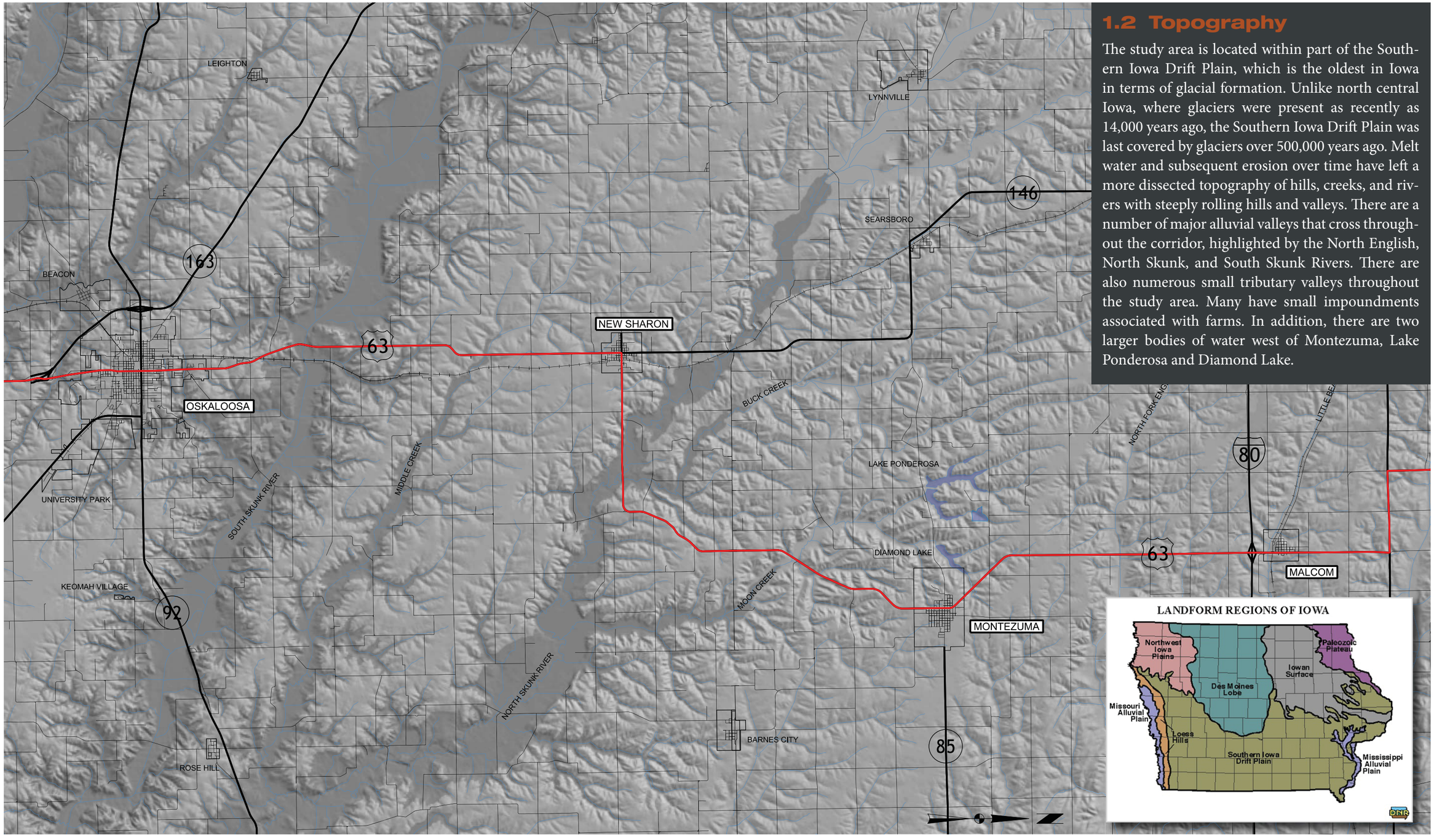
Regional U.S. Highway 63 Route



National U.S. Highway 63 Route

1.2 Topography

The study area is located within part of the Southern Iowa Drift Plain, which is the oldest in Iowa in terms of glacial formation. Unlike north central Iowa, where glaciers were present as recently as 14,000 years ago, the Southern Iowa Drift Plain was last covered by glaciers over 500,000 years ago. Melt water and subsequent erosion over time have left a more dissected topography of hills, creeks, and rivers with steeply rolling hills and valleys. There are a number of major alluvial valleys that cross throughout the corridor, highlighted by the North English, North Skunk, and South Skunk Rivers. There are also numerous small tributary valleys throughout the study area. Many have small impoundments associated with farms. In addition, there are two larger bodies of water west of Montezuma, Lake Ponderosa and Diamond Lake.



1.3 Study Area Attributes

Route Cities

City of Oskaloosa

As the largest city in Mahaska County, the City of Oskaloosa can trace its beginning to when the state of Iowa was first established. The region was first settled by a group of Quakers in the mid 1800's. The first settler to arrive in the area was William Canfield, who established a trading post in the area which would eventually become Oskaloosa. In 1844 the town was platted and made the county seat of Mahaska County. The town was named after the Creek Indian princess named Ouscaloosa, which means "the last of the beautiful". The Creek and Seminole Indians were at war when Ouscaloosa was taken as a prisoner and eventually became the wife of the Seminole Indian Chief. * (City of Oskaloosa)

The town of Oskaloosa is notable for a musical history. The original settlers of the town had a strong infinity for playing music and that eventually led to the creation of an organized band as early as 1864. Originally built in 1873, the Bandstand is where the nationally recognized Oskaloosa City Band has played in the city square since the late 19th century. The band first gained Midwest recognition for their performance in 1886 at the national conclave in St. Louis. The City Band continued to gain national fame in the early 20th century, with performances at events such as the 1904 World's Fair. There was continued success throughout the 20th century. Today, every Thursday from June to August, the residents of Oskaloosa are able to come down to the City Square and listen to the Oskaloosa City Band perform.* (City of Oskaloosa) (The History of the Oskaloosa Municipal Band)

With its completion in the early 20th century, U.S. Highway 63, or Market Street, is a north/south route through of the city of Oskaloosa. Today U.S. Highway 63/Market Street is a two-lane roadway that is used as the main route through the downtown area of Oskaloosa. Many of Oskaloosa's prominent downtown buildings or businesses are along U.S. Highway 63 including the Central United Methodist Church, Musco Lighting, Penn Central Mall, and central park (that holds the historic Bandstand). William Penn College is also along U.S. Highway 63 north of the downtown area. The town is experiencing growth with 11,472* residents in 2011. This is a 4.9% increase in population since 2000. With the increase of trucking and population in Oskaloosa, the city is concerned with the amount of traffic going through downtown. (City-Data).

City of New Sharon

The City of New Sharon, Iowa was developed in 1856 by a group led by William Zimmerman. Mr. Zimmerman wanted to call the town "Schenefell" which means "pretty field". The other residents did not like the accent of the name, so the name Sharon was determined. That held until the town established a post office and discovered there was already a town in Iowa called Sharon, so the post office was designated New Sharon, which is the name the town associates itself by today.

The town of New Sharon is centrally located between Grinnell, Pella, Montezuma, and Oskaloosa.

U.S. Highway 63 comes from the south through New Sharon and then turns east once the roadway reaches downtown. With increasing truck traffic on U.S. Highway 63, the downtown area is becoming more congested. Majority of the trucking traffic either will turn east and continue on U.S. Highway 63, or continue north on Iowa Highway 146. Pella Products Inc, Pro-Line Building Co., and Dun Rovn LLC are all located along U.S. Highway 63 in New Sharon. New Sharon has seen its population decrease by 0.5% since 2000 with a 2011 population of 1,294*. (City Data)

City of Montezuma

The City of Montezuma was originally founded in 1848. Montezuma came by its name when local veterans of the Mexican-American War decided to name the town after the last Aztec emperor of Mexico, Monteuczomah. Montezuma quickly became a regional railroad transport focal point and became the Poweshiek County Seat.

Montezuma is known for the preservation of historically significant events not only regionally but also at a national level. In 1979, a group of residents decided to start the Poweshiek County Historical & Genealogical Society. Today the Historical Society Headquarters is located at the 1918 Carnegie Library in Montezuma's National Historic District. The Carnegie Library is on the National Register of Historic Places. The United States Department of Interior designated Montezuma's downtown as a National Historic District. The Historical Society has purchased some of the older buildings in Montezuma. The 1913 County Jail was purchased, and is now being renovated to be used as a museum and hosts traveling historic exhibitions. Montezuma also has several historically significant monuments throughout the historic downtown area including the new 9/11 World Trade Center monument.*

U.S. Highway 63, or Front Street, passes north/south through Montezuma just to the west of the Historic Downtown. Currently, Front Street is a two-lane roadway with a combination of residential and commercial frontages. Montezuma's major businesses include Brownells Inc, Sutherland Printing Co., and Streetrod Productions. Montezuma has experienced an increase in population since 2000. In 2010, the population of Montezuma was 1,462.*

City of Malcom

The Malcom Township was first organized in 1858 and then incorporated on April 23, 1872.

The town of Malcom was originally a railroad town that is now adjacent to the interstate. The Raymond P.P. House was included on the National Register of Historical Places in 1985.

U.S. Highway 63, or Montezuma Street, was paved in 1936. The original pavement from 1936 is still in use today. Malcom Lumber & Hardware Inc., Dayton Meat Products Inc, and US Consolidated Farm Services Agency are located along U.S. Highway 63. Since 2000, Malcom has experienced a decrease in population. In 2010, the population has decreased by 18.5% with 287 residents still remaining in the town.* (City Data).

Important Nearby Cities

City of Pella

The City of Pella is located in the northeast corner of Marion County. In the 1840's a group of Dutch immigrants were facing famine and religious persecution in the Netherlands. The Dutch immigrants led by Peter Henry Scholte fled the Netherlands and founded the town of Pella in the prairies of Iowa in 1847. Before fleeing the Netherlands, Peter and his followers decided to name their new town Pella which meant "The City of Refuge". (Pella Iowa)

The City of Pella is most known for the Tulip Time festival, where the town celebrates its Dutch heritage. The Tulip Time inaugural year was 1935, when local residents wanted to establish a festival to commemorate their heritage after the success of the High School's spring performance of the operetta "Tulip Time in Pella". The first year's festival was different than today's celebration. There were no tulips, food vendors, or even parades, just Dutch songs, psalms, and speeches. The residents planned on planting 85,000 tulips that upcoming fall. Today's celebration has thousands of tulips, the Tulip Queen ceremony, the Pella Historic Village, and many other events throughout the five day festival. (Pella Tulip Time)

Iowa Highway 163 passes along the southwest side of Pella. With a population of 10,338 in 2011, the town's population has increased 5.1% since 2000*. A large percentage of the town's employment is from either Pella Corporation or Vermeer. The town's two major manufacturers have immediate access to the highway system with interchanges just south of their respective headquarters. This allows the two companies a suitable trucking route to the Des Moines metro area and to the southeastern part of Iowa. However there is no convenient trucking route north and east. The city of Pella is looking at improvement options to make the area more competitive in transportation. (City-Data)

City of Ottumwa

In 1843, a group of investors formed the Appanoose Rapids Company. The group was able to stake claim to 467 acres of land. The Appanoose Rapids Company established the new settlement as the county seat of the newly formed Wapello County. The settlement was initially called Louisville, but was changed and became officially known as Ottumwa. The word Ottumwa has Sac Indian origin, and the two accepted possible meanings are "place of perseverance or self will" and "land of rippling water".

Ottumwa is known for being an industrial town and has the recent distinction as the Video Game Capital of the World. Cargill Meat Solutions and John Deere are two of the major industries that are found in Ottumwa. The Cargill Meat Solutions Corp. is a processor and distributor of fresh pork, beef, turkey, and marinated meats. The plant in Ottumwa specializes as a pork producing facility. John Deere is a manufacturer of agricultural, residential, forestry, and construction products. The Ottumwa factory specializes in producing equipment for agricultural purposes. The Video Game Capital of the World title originated from the 1980's where the local video game arcade, Twin Galaxies, started keeping the official high scores from across the country. Ottumwa then hosted the first North American Video Game Olympics in 1982. The arcade is now closed, but Twin Galaxies is now the official organization that tracks video game records around the world. Today there are local residents and videogame developers that are working together on building a videogame museum in Ottumwa.

Cargill and John Deere are located on the south side of Ottumwa along the Des Moines River, which provides convenient access for the two manufacturers to U.S. Highway 63 and U.S. Highway 34. There are easily accessible transportation routes north, east, and south from town. The 2010 census revealed that Ottumwa's population of 25,023 had remained almost constant with a 0.10% increase since 2000.

City of Eddyville

The City of Eddyville is located at the Northwest corner of Wapello, Northeast corner of Monroe, and the South side of Mahaska County. In 1841, a man named J.P. Eddy decided to move further west from Ohio, and settled in the area. J.P. Eddy aimed to start a farm and an Indian trading post. Even though J.P. Eddy left after only three years, he established the first store, school, and post office in the region. For that, the remaining residents decided to call the town Eddyville.

Eddyville is most known for being an Industrial town, with four global manufacturers having sites there. Eddyville's signature company is Cargill, which is an international producer and marketer of food, agricultural, and industrial products and services. The Eddyville plant specializes as a corn processing plant. Wacker Chemie AG, Ajinomoto North American Inc, and Chamness Technology Inc are also found in Eddyville. The Wacker Chemie AG is a global chemical company. The Eddyville site focuses in producing cyclodextrins. Cyclodextrins are used as stabilizers and carriers in pharmaceutical products. Ajinomoto specializes in amino acid research for processed food, seasonings, fine chemicals, pharmaceutical goods, and animal nutrition. Chamness Technology Inc focuses on non-hazardous waste handling, and provides composting, dewatering, dredging, and land applications. CTI has a composting facility in Eddyville.

The 2010 census revealed that Eddyville's population had decreased 3.76% since 2000 to 1,024. However the industries there draw a workforce from around the region.

1.4 Route History

Early State of Iowa roadway maps show the U.S. Highway 63 route as early as 1919. Today's U.S. Highway 63 was classified as Route 59 and today's Iowa Highway 146 was classified as Route 63; see the Historical Transportation Maps to observe the chronology and evolution of the route. Construction started on today's U.S. Highway 63 route in the early 1920's. By the end of 1922, the roadway from Oskaloosa to just north of the Skunk River, and U.S. Highway 6 north of Malcom was built to permanent grade. It took from 1922 to 1939 to completely grade and pave the full length of the roadway from Oskaloosa to U.S. Highway 6 north of Malcom. In 1935 the roadway was classified as U.S. Highway 63.

1919
- Oldest archived State transportation map.
- Planned primary roads shown in red.

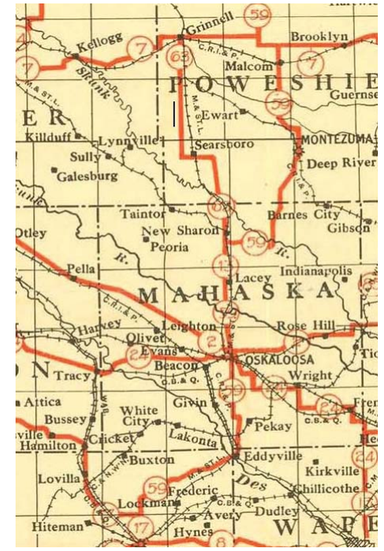
1922
- U.S. Highway 63 (shown as Highway 59) north of Oskaloosa built to permanent grade.

1927
- U.S. Highway 63 (shown as Highway 59) from U.S. Highway 6 to Mahaska/Poweshiek county line.

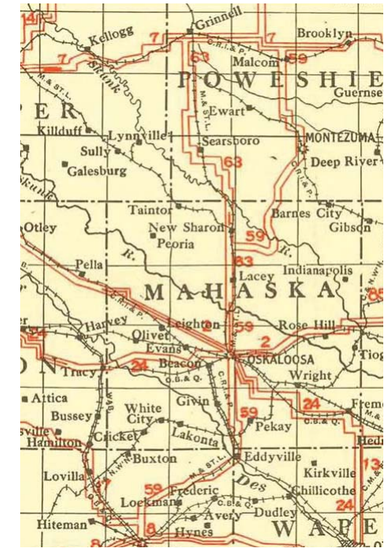
1932
- U.S. Highway 63(shown as Highway 59) paved from Oskaloosa to New Sharon.
- U.S. Highway 63 (shown as Highway 59) under construction from New Sharon to Mahaska/Poweshiek county line.
- U.S. Highway 63 (shown as Highway 59) paved north of Malcom.

1935
- Route now officially designated U.S.Highway 63.
- U.S. Highway 63 paved from New Sharon to Mahaska/Poweshiek county line.

1936
- U.S. Highway 63 paved from Malcom to Montezuma.

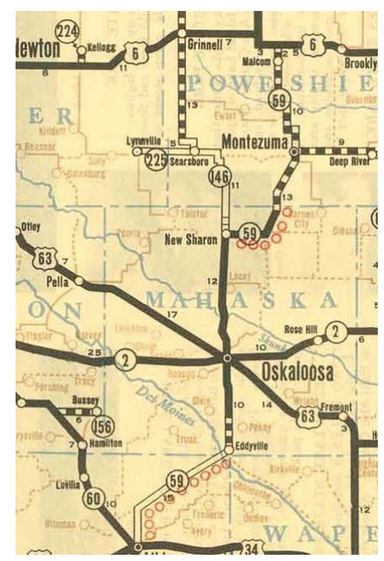


1919

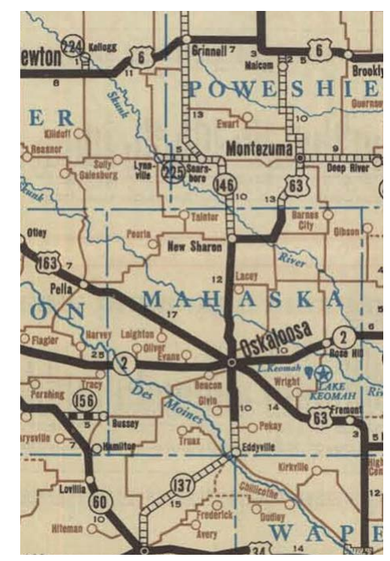


1922

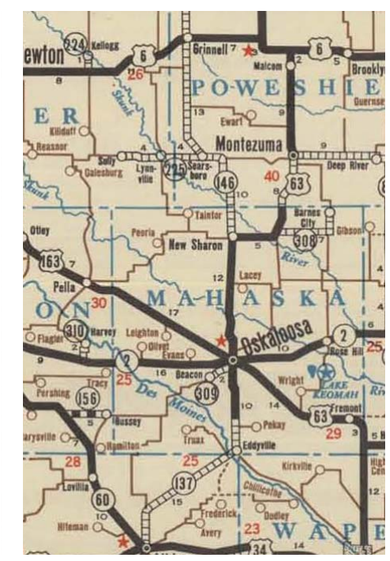
1922



1932

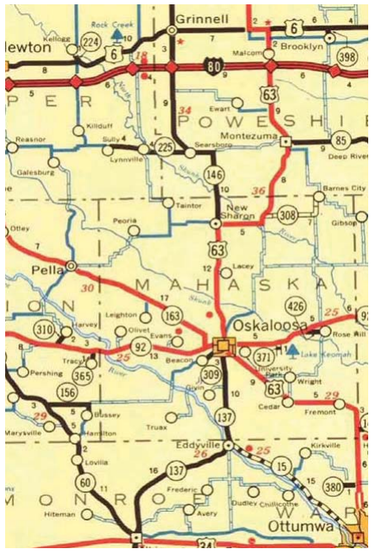


1935



1936

1939

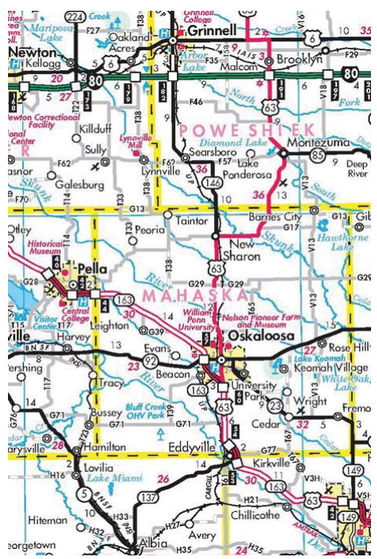


1965

2004

2005

2012



2013

1939
- U.S. Highway 63 paved from Montezuma to Mahaska/Poweshiek county line.
- U.S. Highway 63 now completely paved from Oskaloosa to U.S. Highway 6 north of Malcom.

1965
- I-80 is completed at the north end of the U.S. Highway 63 corridor.

2004
- Last year of the Principal State Roadway Classification System.

2005
- First year of the National Highway System.
- U.S. Highway 63 classified as Other Principal Route.

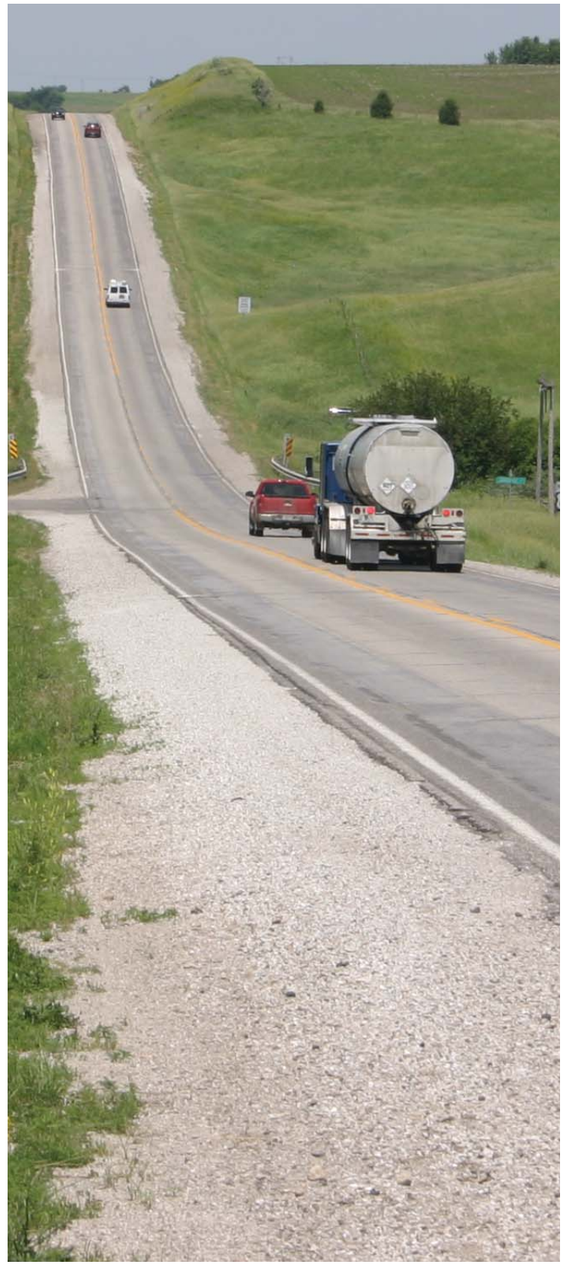
2012
- U.S. Highway 63 shown as Other Principal Route for the last time.

2013
- U.S. Highway 63 from Ottumwa to Waterloo added to Iowa's Commercial and Industrial Network.

1.5 Current Roadway Conditions

As exhibited on the historical maps, the 37.8 miles of U.S. Highway 63 from U.S. Highway 163 to U.S. Highway 6 are generally unchanged in terms of alignment and profile from its original construction. This poses several challenges when the roadway is compared to modern primary highway design standards.

Light Detection and Ranging (LIDAR) software was used to determine stationing and develop a profile view of the existing highway. The profile view of the highway was used to analyze how the existing roadway conforms to either preferred or acceptable design standards in Chapter 1C-1 (06/13/2012) of the Iowa DOT Design Manual. The tables on this page report the current criteria for a design speed of 60 mph.

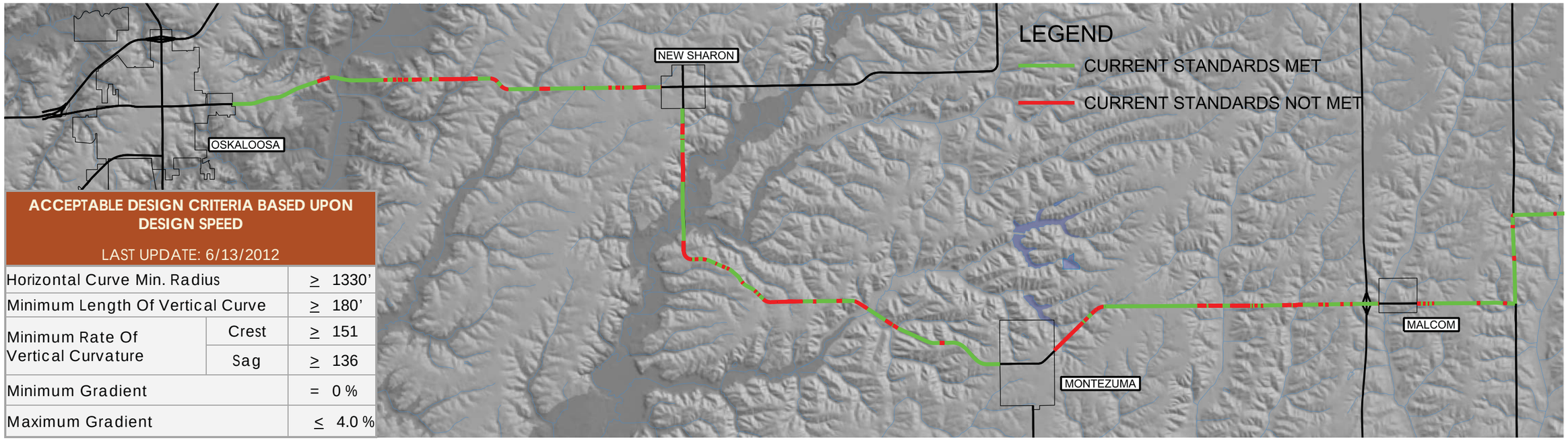


Existing Roadway and Current Design Criteria

Sections of existing U.S. Highway 63 that do not meet current design standards are shown on the Preferred Standards and Acceptable Standards Maps. The red on the maps are segments where geometry does not meet current design standards, and green shows where the current standards are met.

MAP	RED	GREEN
Preferred Standards	67.10%	32.90%
Acceptable Standards	32.90%	67.10%

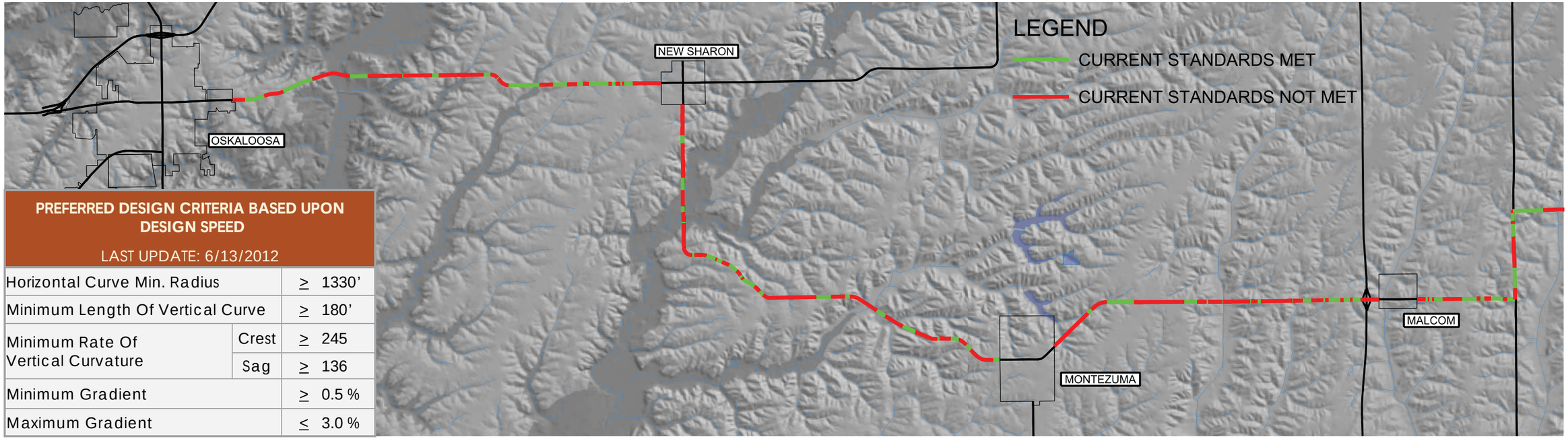
LOCATION	MAP	RED (%)	GREEN (%)
Oskaloosa New Sharon	Preferred	61.5	38.5
	Acceptable	31	69
New Sharon Montezuma	Preferred	73	27
	Acceptable	33.9	66.1
Montezuma Malcom	Preferred	76	24
	Acceptable	42.6	57.4
Malcom Hwy. 6	Preferred	51.2	48.8
	Acceptable	12.8	87.2



ACCEPTABLE DESIGN CRITERIA BASED UPON DESIGN SPEED

LAST UPDATE: 6/13/2012

Horizontal Curve Min. Radius		≥ 1330’
Minimum Length Of Vertical Curve		≥ 180’
Minimum Rate Of Vertical Curvature	Crest	≥ 151
	Sag	≥ 136
Minimum Gradient		= 0 %
Maximum Gradient		≤ 4.0 %



PREFERRED DESIGN CRITERIA BASED UPON DESIGN SPEED

LAST UPDATE: 6/13/2012

Horizontal Curve Min. Radius		≥ 1330’
Minimum Length Of Vertical Curve		≥ 180’
Minimum Rate Of Vertical Curvature	Crest	≥ 245
	Sag	≥ 136
Minimum Gradient		≥ 0.5 %
Maximum Gradient		≤ 3.0 %

Passing Zones

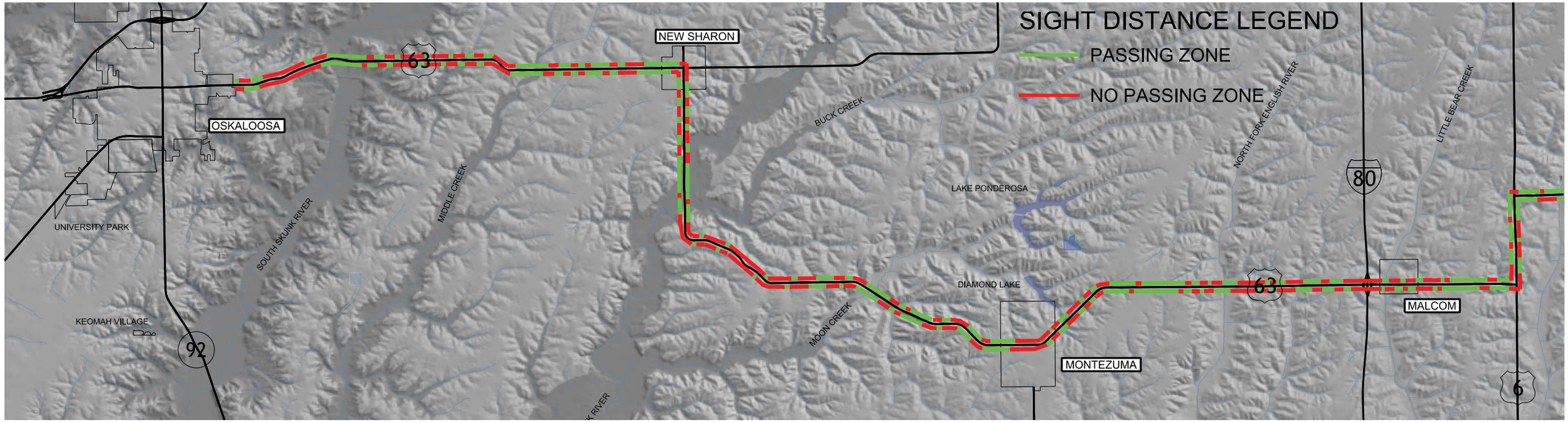
Further analysis of the profile reveals there are 126 vertical crest and sag curves along the 37.8 mile stretch of U.S. Highway 63, 90 of the tangent grades between these curves exceed 3%. Since many of the vertical curves are not within current design standards, the passing sight distance, and existing centerline marks of U.S. Highway 63 were reviewed. The Sight Distance Map identifies where traffic on U.S. Highway 63 can and cannot pass. The U.S. Highway 63 Passing Standards Percentages Tables display the percentages of the amount of red (no passing) and green (passing is possible in terms of sight distance) on the maps.

U.S. Highway 63 Passing Standards Percentages - Roadway Sections

LOCATION	TRAFFIC DIRECTION	RED (%)	GREEN (%)
Oskaloosa New Sharon	North Bound	54.6	45.4
	South Bound	55.4	44.6
New Sharon Montezuma	North Bound	61.4	38.6
	South Bound	57.7	42.3
Montezuma Malcom	North Bound	57.2	42.8
	South Bound	58.3	41.7
Malcom Hwy. 6	North Bound	45.6	54.4
	South Bound	31	69

U.S. Highway 63 Passing Distance Percentages

TRAFFIC DIRECTION	RED	GREEN
North Bound	56.20%	43.80%
South Bound	53.40%	46.60%



Existing Pavement Conditions

Pavement condition on U.S. Highway 63 was initially studied for the prior Area Transportation Study to determine areas recommended for improvement or reconstruction. The study reported that U.S. Highway 63 between Oskaloosa and U.S. Highway 6 consists of older construction and low pavement quality. This route was originally constructed in the 1930's, and has been maintained with subsequent asphalt overlay projects. The last asphalt overlay was placed in 2010. Refer to the Poweshiek and Mahaska County Construction History Tables for the history of construction and resurfacing of U.S. Highway 63.

In some areas, the pavement has exceeded its design life, and with increased heavy truck use to serve the growing industries in the area, the pavement continues to deteriorate. While overlays improve the surface and provide additional strength to extend the pavement design life, the overall structural efficiency of the total pavement section has decreased in certain locations and will begin to warrant reconstruction rather than surface repair work.

POWESHIEK COUNTY 2011 CONSTRUCTION HISTORY

Location	Beg. Mile Post	End. Mile Post	Length (Miles)	Year	Project Type	Surface Type	Surface Depth	Notes
New Sharon to Montezuma	82.77	87.78	5.01	1988	Overlay	BAC	3.0	
	82.77	87.78	5.01	1938	First Pavement	PC7	7.5	
Monte-zuma	87.78	88.91	1.13	1937	Overlay	HMA	2.0	
	87.78	88.91	1.13	1937	First Pavement	PCC	7.0	
Montezuma to Malcom	88.91	96.69	7.78	1988	Overlay	BAC	3.0	
	96.69	97.06	0.37	1964	First Pavement	PCC	10.0	
	88.91	96.69	7.78	1936	First Pavement	PC7	7.0	
Malcom	97.06	97.45	0.39	1993	First Pavement	PCC	9.5	Part of Sect. Reconstructed
	97.45	97.75	0.3	1935	First Pavement	PCC	7.0	
Malcom to U.S. Highway 6	102.11	103.16	1.05	2007	Overlay	HMA	1.5	
	102.11	103.16	1.05	2007 W	Overlay	HMA	1.5	
	97.75	100.13	2.38	1988	Overlay	BAC	3.0	
	102.11	103.16	1.05	1980	First Pavement	PCC	8.5	
	97.75	100.13	2.38	1936	First Pavement	PC7	7.0	

MAHASKA COUNTY 2011 CONSTRUCTION HISTORY

Location	Beg. Mile Post	End. Mile Post	Length (Miles)	Year	Project Type	Surface Type	Surface Depth	Notes
Oskaloosa to New Sharon	67.00	67.58	0.58	2010	Overlay	HMA	1.5	
	67.00	67.58	0.58	2010 W	Widening	HMA	1.5	Widen 4' Both Sides
	67.58	68.31	0.73	2010	Overlay	HMA	1.5	
	67.58	68.31	0.73	2010 W	Widening	HMA	1.5	Widen 4' Both Sides
	68.31	69.85	1.54	2010 W	Widening	HMA	1.5	Widen 4' Both Sides
	69.85	75.31	5.46	2010 W	Widening	HMA	1.5	Widen 3' Both Sides
	68.31	75.31	7.00	2009	Overlay	HMA	1.5	
	64.80	65.57	0.77	2008	Overlay	HMA	1.5	
	64.80	65.57	0.77	2008 W	Overlay	HMA	1.5	
	65.57	66.13	0.56	2008	Paving	PCC	10.0	
	69.85	75.31	5.46	2001 V	Overlay	AAC	1.5	
	64.80	65.57	0.77	1988	Overlay	AAC	4.5	
	66.13	67.58	1.45	1988	Overlay	AAC	4.5	
	68.31	75.31	7.00	1988	Overlay	AAC	4.5	
	67.58	68.31	0.73	1979	First Pavement	PCC	9.0	
	69.85	75.31	5.46	1974	Overlay	AAC	1.5	
	64.80	65.57	0.77	1962	First Pavement	PCC	10.0	
	66.13	67.58	1.45	1962	First Pavement	PCC	10.0	
	68.31	69.85	1.54	1962	Overlay	AAC	1.5	
	69.85	75.31	5.46	1953	Overlay	BAC	1.5	
	68.31	75.31	7.00	1930	First Pavement	PC7	7.0	
New Sharon	75.31	75.95	0.64	2009	Overlay	HMA	1.5	
	75.31	75.95	0.64	1955	First Pavement	PCC	8.5	
	75.95	76.32	0.37	1987	First Pavement	PCC	9.0	
New Sharon to Montezuma	76.32	82.77	6.45	2010	Overlay	HMA	1.5	
	76.32	82.77	6.45	1984	Overlay	BAC	1.5	
	76.32	82.77	6.45	1953	Overlay	BAC	1.5	
	76.32	82.77	6.45	1933	First Pavement	PC7	7.0	

1.6 Existing Traffic

Traffic on the U.S. Highway 63 corridor is summarized in Year 2010 traffic data from the Iowa DOT. This data, shown in the Existing Traffic Volumes Table indicates that traffic varies along the study corridor and is generally between 2,000-3,000 vehicles per day. In addition, the current network splits into two two-lane north/south highways of U.S. Highway 63 and Iowa Highway 146 between New Sharon and Interstate 80.

Traffic volumes immediately north of Oskaloosa are near 4,500 vehicles per day, dissipating to 2,200-3,000 vehicles per day along the majority of the corridor north to New Sharon. There, traffic splits with Iowa Highway 146, and U.S. Highway 63 traffic reduces to 1,500 vehicles per day until Montezuma. Between Montezuma and U.S. Highway 6, including the interchange at Interstate 80, existing traffic increases to 2,600-3,200 vehicles per day.

Truck percentages along the corridor are consistently between 14% and 18%. For Oskaloosa to New Sharon, this would translate to between 335-430 trucks per day. Assuming 80% of these trucks operate during the primary daytime working hours, this results in an average of 40-50 trucks per hour, or slightly less than one truck per minute.

Existing Traffic Volumes

U.S. Highway 63 Corridor Segment	Iowa DOT Year 2010 Annual Daily Traffic (AADT) (Veh/day)
Oskaloosa to New Sharon	3000
New Sharon to Montezuma *	1350
Montezuma to Interstate 80 *	2600
Interstate 80 to U.S. Highway 6 *	2500

* Traffic volumes split between U.S. Highway 63 and Iowa Highway 146, which carries 1,800 vehicles per day between New Sharon and U.S. Highway 6.

1.7 Crash History

Analysis of Iowa DOT crash data showed that the US 63 corridor currently experiences a higher than average crash rate. The crash rate takes into account the frequency of crashes as well as the exposure for crash opportunities due to segment length and traffic volumes. This calculation results in a rate expressed as crashes per one-hundred million vehicle miles traveled (cr/HMVM). The Iowa DOT statewide average rate for Rural Primary US Highways is 92 cr/HMVM for all crashes, and 26 cr/HMVM for Fatal+Injury crashes.

As seen in the U.S. Highway 63 Crash Rates for Rural Segments Table, all of the rural segments experience a crash rate higher than the statewide average. In addition, the urban segment through the City of Oskaloosa has a higher crash rate of 348 cr/HMVM compared to statewide average on Municipal Primary U.S. Highways of 290 cr/HMVM, and a higher Fatal+Injury crash rate of 101 cr/HMVM compared to 91cr/HMVM. The total U.S. Highway 63 corridor from U.S. Highway 63/Iowa Highway 163 to U.S. Highway 6 experienced 390 crashes over 5 years, or approximately 80 crashes per year.

The severity of the 165 rural segment crashes was distributed as follows (frequency / percentage of crashes):

- Property Damage Only (103 / 62%)
- Possible/Unknown Injury (34 / 21%)
- Minor Injury (17 / 10%)
- Major Injury (7 / 4%)
- Fatal (4 / 3%)

U.S. Highway 63 Crash Rates for Rural Segments

U.S. Highway 63 Corridor Segment	'10 Traffic Volume (AADT)	'07-'11 Crashes	Segment Length (mi)	'07-'11 Crash Rate (cr/HMVM)	'07-'11 Fatal+Inj Crash Rate (cr/HMVM)
Oskaloosa to New Sharon	3100	64	10	113	55
New Sharon to Montezuma	1400	33	11.5	112	44
Montezuma to Interstate 80	2800	41	7.5	107	21
Interstate 80 to U.S. Highway 6	2500	27	3.5	169	63
			Statewide Average	92	26

U.S. Highway 63 Crash Rates for Urban Segments

U.S. Highway 63 Corridor Segment	'10 Traffic Volume (AADT)	'07-'11 Crashes	Segment Length (mi)	'07-'11 Crash Rate (cr/HMVM)	'07-'11 Fatal+Inj Crash Rate (cr/HMVM)
Oskaloosa	7200	192	4.2	348	101
New Sharon	3500	14	1.1	199	43
Montezuma	3500	19	1.5	198	63

Major Causes of crashes in the rural segments through 2007-2011 were:

- Run-Off-Road/Lost Control (34)
- Animal (31)
- Failure to Yield ROW (25)
- Swerving/Evasive Action (22)
- Driving Too Fast (15)
- Crossed Centerline (13)

This data indicates that in rural segments, a large number of the crashes were low severity, primarily resulting from major causes involving human error (driving too fast, failure to yield ROW) and vehicle/roadway interaction (run-off-road, swerving, crossed centerline). Many animal crashes are difficult to avoid and are not attributed to the road design. However, as with other primary crash types, the roadway can influence the occurrence and/or outcome of animal crashes. Horizontal and vertical curves contribute to the driver's ability to see an animal before a potential crash. Road design elements such as shoulders, ditch slopes and medians can provide a more forgivable outcome if a crash is to occur or be avoided.

The higher than average crash rates are consistent with the evaluation of existing roadway deficiencies when compared to preferred and acceptable design criteria described earlier in this report.

RURAL HIGHWAY CRASH HISTORY

SECTION 1
STUDY BACKGROUND

SNYDER & ASSOCIATES, INC.

Corridor Location Study

2.1 Study Process

The intent of this study is to review the existing U.S. Highway 63 facility and determine potential improvements to suit the indentified purpose and need. The transportation needs of the area have significantly changed, particularly in terms of freight movement.

Typically, new highway improvements are studied through a process developed to ensure compliance with the National Environmental Policy Act (NEPA). However, the NEPA process is used when construction is imminent or at least planned in the near term. At the time this study commenced, there were no improvements programmed for U.S. Highway 63 between U.S. Highway 163 and U.S. Highway 6. Likewise, entire reconstruction of U.S. Highway 63 would cost in the hundreds of millions of dollars, far too much for the limited resources of the Iowa DOT, particularly when considering all the transportation demands placed upon the state's transportation system.

However, there still needs to be a method to study and review potential highway improvements in a "pre-NEPA" sense, so that policy makers and improvement advocates have good information to make decisions, set goals, and plan for the future.

The process for this study will identify similar aspects as a NEPA study would, only in somewhat less detail. Protected resources will be identified by "windshield" surveys, literature searches and review of aerial photography. Using the locations of these resources as areas of avoidance, potential highway improvements will be identified in accordance with the purpose and need, to meet design criteria that will accomplish the level of service desired by the region.

Participation of area governments and the public is key to developing an understanding of the transportation needs but also to preserve what the communities feel is important in the balance of improved transportation versus the impacts of change.

As part of the U.S. Highway 63 Area Transportation Study, a wide variety of alignment improvements were contemplated for an improved U.S. Highway 63. This is the starting point for this study. Alignment alternatives, including a "no-build" alternative; will be developed which avoids the aforementioned protected resources that were identified.

A hierarchy of desirable criteria and impact criteria will be developed and weighted, with public input, to develop a scoring system to find the most desirable improvement alternatives for future consideration.

An "ultimate build" alignment will be determined to set the long-range goal for improving the highway in its entirety. Constructible portions of the "ultimate build" corridor will be identified and prioritized.

High priority projects will then be ready for programming and detailed study through the NEPA process.

2.2 Public Input

The East Central Iowa Transportation Coalition has maintained public involvement throughout the duration of this study. Several meetings were held to engage stakeholders from the project area. Additional meetings were held with the Iowa DOT and the Advisory Board to aid in communication of the transportation needs and study goals. The following timeline illustrates the level of involvement and commitment of these groups.

2.3 Economic Development

The highest goal of the East Central Iowa Transportation Coalition is to enhance the culture of economic development in this area. This goal aligns perfectly with MAP-21 legislation that was enacted in 2012, which is intended to "strengthen the ability of rural communities to access national and international trade markets". Within this 2,000 square mile region, 70% of the businesses manufacture goods that are exported out of the United States, almost double the statewide rate of 39%. These businesses include four of the top ten manufacturers in Iowa. Given the opportunity, over half of the businesses in the East Central Iowa area plan to expand within the next three years. These businesses all rely on safe and efficient transportation infrastructure to deliver goods to their markets. Whether the goods are destined for the interstate, the railroad, or the river, all the freight generated by this region depends on U.S. Highway 63.

2.4 Intermodal Opportunities

Intermodal transportation has been a focus of the Iowa DOT for the past few years. U.S. Highway 63 is perfectly positioned to create multiple intermodal opportunities. In Malcom, the Iowa Interstate Railroad serves the agribusinesses situated near the highway. An interchange at Interstate 80 provides direct access to markets in Omaha and Chicago, and to the Missouri and Mississippi Rivers. North of Oskaloosa, U.S. Highway 63 crosses the Union Pacific Railroad providing the opportunity for a potential intermodal site. There is potential for a new regional airport west of Oskaloosa which would provide convenient access to air freight service. And in Eddyville, the Burlington Northern Sante Fe Railroad currently serves an intermodal site near the Iowa Bioprocessing Center .

2.5 Desirable Route Criteria

Priorities as ranked by the Steering Committee were included in the evaluation of alternatives and included the following:

1. Increased economic development potential/future growth
2. Reduced time of travel
3. Maintain highway speed/truck friendly
4. Less out of distance travel
5. Close proximity to existing U.S. Highway 63
6. Low construction cost
7. Potential for interim improvement projects
8. Avoidance of Century Farms

Traffic Impacts

3.1 Highway Lane Configuration (4-lane vs Super-2)

Two-lane and four-lane highways operate under a variety of volume and terrain conditions, and the Highway Capacity Manual (HCM) 2010 provides methodology to assess the relationship of volume to capacity of existing and planned highway segments. For two-lane highways, this methodology primarily estimates two performance measures: average travel speed and percent time spent following. The table below summarizes these criteria and their relationship to the roadway Level of Service (LOS).

Level of Service Criteria for Two-Lane Class Highways

LOS	Percent Time-Spent Following	Average Travel Speed (mi/h)
A	≤ 35	> 55
B	> 35 - 50	> 50 - 55
C	>50 - 65	> 45 - 50
D	> 65 - 80	> 40 - 45
E	> 80	≤ 40

Note: LOS F applies whenever flow rate exceeds segment capacity

Several states have sponsored research to detail informational volume thresholds for two-lane highways, Super-2 highways, and four-lane highways. A report produced for the FHWA by the Texas Transportation Institute investigated design standards for passing lanes on two-lane highways, potentially for Super-2 highways. This report recommended that "conversion of Super-2 roadways to four-lane highways should be considered when traffic volumes exceed 6,000 ADT for level terrain and 5,000 ADT in rolling terrain." While these volume limits were removed from the Texas DOT Roadway Design Manual in 2011 to recognize Super-2 roadways at higher volumes in certain contexts, it is noted the updated Super-2 research report data continued to show that LOS approaches LOS C with volume scenarios between 5,000-7,000 vpd (10% to 20% truck percentage, rolling terrain) with 1-3 mile long passing lanes every 2-3 miles.

These recommendations correlate with analysis performed and summarized in a Kansas DOT report regarding minimum volumes to warrant consideration of passing lanes based on LOS, terrain, percent trucks and percentage of "no-passing" zones. This report did not provide a limit for roadways with passing lanes, but it is noted that the upper limit of two-lane volumes when passing lanes should be considered for in an ideal situation with less than 10% trucks and 0% no passing zone was 6,200 vpd for level terrain and 4,850 vpd in rolling terrain. Analysis of the U.S. Highway 63 corridor showed that the percentage of no passing zones is near 50%, and the truck percentage is between 15-20%. According to the Kansas study, these roadway characteristics would warrant a two lane roadway with passing lane consideration at just 1,710 vpd and 3,140 vpd for LOS B and LOS C, respectively.

3.2 Traffic Projection

Numerous traffic projections have been made for the U.S. Highway 63 corridor. A preliminary corridor analysis documented historical traffic data on U.S. Highway 63 and surrounding highways. The analysis period is 25-30 years in the future to year 2035 or 2040, therefore historic traffic data was summarized back to 1986. This data was used to prepare future traffic projections in two ways. First, projections were made with a rate that reflected traffic on the U.S. Highway 63 traffic corridor and east central Iowa primary highways. These rates varied by segment from lower than 1% for some segments to above 2%, with lower rates when only the last 15 years were analyzed. Therefore, a lower regional average annual growth rate of 1.5% was also applied. Second, projections were prepared using the statewide average traffic growth rate, since U.S. Highway 63 is a Primary U.S. highway with potential for regional and multi-state travel when improved. This annual growth rate is approximately 2.3%, resulting in higher projections and a likely 'upper limit' for growth rate without significant roadway improvements.

In addition to the projections relating to growth rate, the Iowa DOT Office of Systems Planning provided traffic modeling outputs for consideration. The iTRAM model is more robust than simple traffic history, using historic traffic volumes as well as variables such as population numbers and community socioeconomic factors, land use, and roadway variables. This analysis provided Year 2035 projections.

However, for the corridor study it is assumed the future roadway would not be a "no-build" alternative, and an improved U.S. Highway 63 would attract traffic in a manner not simply attributed to background traffic growth. Improved pavement condition, horizontal and vertical alignments and capacity will improve travel time and road experience and attract more traffic. In 2012, Iowa DOT Office of Systems Planning provided an updated iTRAM analysis with many of the "constraints" to the U.S. Highway 63 corridor removed (e.g. two-lane capacity changed to four lane, speed limit increased to 65 mph, etc). This Study provided potential Year 2035 volumes with these long term corridor improvements.

A final consideration for traffic projections is the "fork" in the corridor at New Sharon, where both Iowa Highway 146 and U.S. Highway 63 connect to Interstate 80 and points beyond. Currently, about half of the U.S. Highway 63 traffic for the area follows Iowa Highway 146 and half travels on U.S. Highway 63, with additional traffic on U.S. Highway 63 north of Montezuma. It is assumed that an improved U.S. Highway 63 would attract much of the Iowa Highway 146 traffic, especially the truck traffic which ranges from 14% to 18% AADT on U.S. Highway 63 and Iowa Highway 146.

The volumes calculated for the various projections are summarized in the Appendix. The Year 2040 Traffic Volume Projections Table shows Design Year 2040 volumes used for this study. These volumes may vary depending on economic development such as agriculture related industry in the surrounding area.

Year 2040 Traffic Volume Projections

US 63 Corridor Segment	Projected Year 2040 Annual Daily Traffic (AADT) (Veh/day)
Oskaloosa to New Sharon	7500
New Sharon to Montezuma	6000
Montezuma to I-80	7500
I-80 to US 6 North of Malcom	5800

Conclusions

Based on the criteria discussed in Section 3-1, these projected volumes support consideration of the corridor as a Super-2 lane corridor in the near term providing turn lanes and passing lanes for safety and capacity improvements, along with corridor preservation and right of way for a potential four-lane corridor in the future.

Alignment Alternatives

4.1 No-Build Alternative

The "No-Build" Alternative must be a consideration in any highway planning study. It is important to consider a "do nothing" alternative, until it is either proven to not meet the purpose and need of the project, or other alternatives are found to be superior.

For this study, the No-Build Alternative was not analyzed or compared in detail against the build alternatives. The No-Build Alternative cannot be discarded until the NEPA process is complete therefore its study and elimination was not a consideration during this study effort.

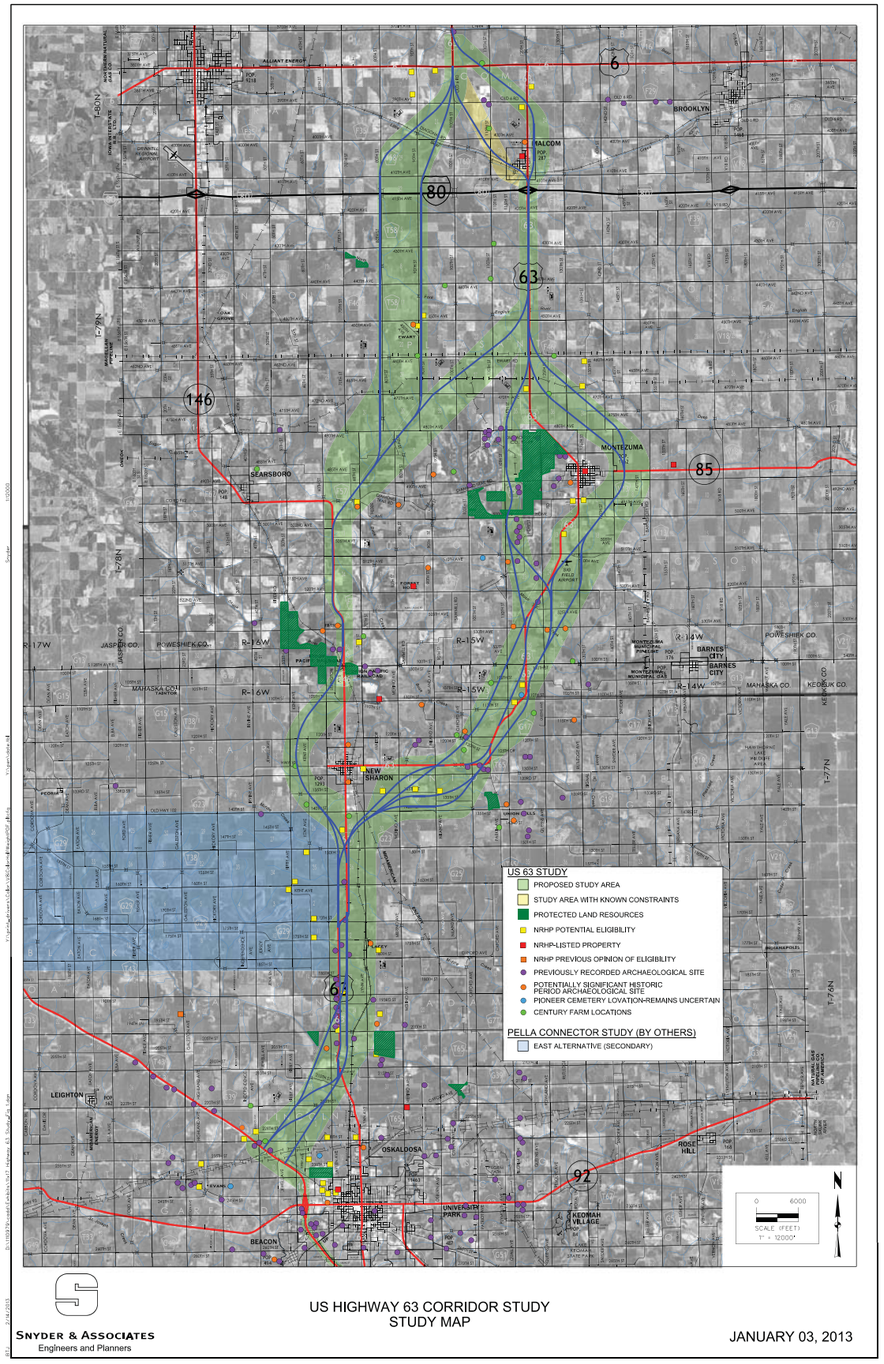
4.2 Build Alternatives

Once the various potential resource studies were completed and mapped, a range of potential build alternatives were developed to both avoid these resources, while also providing improved, more efficient alignments than the current route of U.S Highway 63.

This resulted in the green shaded area shown on the January 3, 2013 map. Within this range, the most desirable route alternatives from a roadway design perspective were identified, which yielded the lines shown within. This map also shows a contemplated range of alternatives of a potential direct connection to the City of Pella, as part of a separate study.

Once this process was completed, it was decided the most efficient way to evaluate the corridors was to divide them into logical segments, see February 19, 2013 Map. The segments were labeled A through I.

After determining the study area and separating the area into smaller segments, roadway alignments were proposed with consideration to topography and criteria discussed with the Streering Committee. There were 17 total alignments in the study area, nine for an east alternative and four for the west alternative. The comparison and scoring process of the alignments became the next focus the U.S. Highway 63 Corridor Location Study.



January 3, 2013 Study Map

Segment A

Early in the project, it was determined that the most significant inhibitor to the effectiveness of U.S. Highway 63 was the long route through the center of Oskaloosa. Capacity improvements through the City are not feasible, since it passes through the downtown square, with historic buildings lining the sidewalks. A west bypass is partially complete via Iowa Highway 163, an access controlled freeway that bends around the west side of Oskaloosa before continuing northwest toward Des Moines. An eastern bypass was also considered for comparison, but route options along existing roadways are limited. In comparison with a west bypass that is already more than half complete, an eastern bypass for U.S. Highway 63 is difficult to justify. The continuance of a U.S. Highway 63 western bypass would either require a new interchange off Iowa Highway 163, or significant modification of the Iowa Highway 92/ Highway 163 interchange. A new interchange would need to be spaced appropriately north of the existing interchange with Iowa Highway 92. Two locations were initially analyzed to determine a feasible location for an interchange, see January 03, 2013 Map. While reviewing topography, avoiding cultural resources, and impacts to existing properties, the interchange is proposed between the original interchange locations, see February 19, 2013 Map. The proposed interchange is located at the Old Hwy 63 and current Iowa Highway 163 intersection, and continues northeast towards the existing U.S. Highway 63. Segment A ends just north of 220th St. with divergence of the potential B Segments.

Segment B

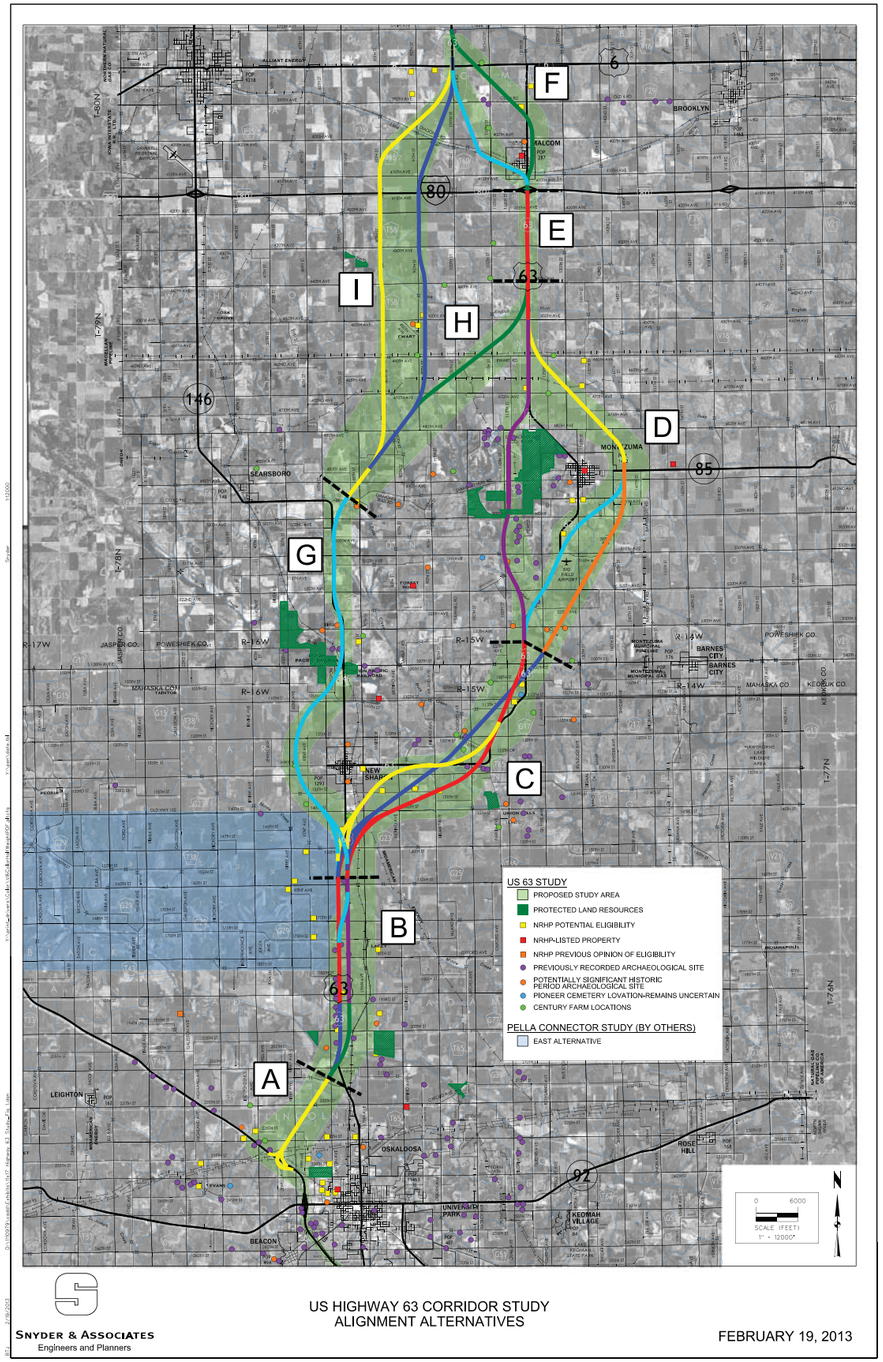
Existing U.S. Highway 63 north of Oskaloosa to New Sharon is straight north-south except for a set of reverse curves that shift the alignment eastward about one quarter mile. This provides three combinations of alignments for a potential improved corridor, a west alignment that follows the existing southern section and extends directly north, an east alignment that extends the existing northern tangent south, and an improved alignment that generally follows the entire existing alignment of U.S. Highway 63, with the

exception of improved (straightened) reverse curves appropriate to today's design standards for Primary Highways, see January 03, 2013 Map. These three alignments comprise the alternatives for Segment B, see February 19, 2013 Map. All three of the routes start at the north end of Segment A, which is just north of 220th Street. Alignment B1 will match up to existing U.S. Highway 63 around 200th St. and follows the existing roadway north until the existing horizontal curve near 170th Street, where B1 will continue due north toward New Sharon. Alignment B2 follows the same route as B1 until 170th Street, where B2 will continue with new reverse curves to head north on existing U.S. Highway 63. B3 will cross the existing U.S. Highway 63 just north of the Skunk River and will proceed north with a heading to match existing U.S. Highway 63 beyond the reverse curves. The proposed B Segments end just north of 160th St. before the divergence of the Segment C and G alignments.

Segment C

The City of New Sharon is just north of Segment B, and includes the right angle turn where existing U.S. Highway 63 turns east. With the goal of improving U.S. Highway 63 as a through corridor, and similar to the portion through downtown Oskaloosa, it is not feasible to improve the capacity through the town of New Sharon. This requires review of potential alignment alternatives either southeast of New Sharon, or west of New Sharon to follow Iowa Highway 146 to the north, see U.S. Highway 63 Corridor Location Study Area on page 7. Segment C is the east alternative. Several alternatives were initially proposed toward Montezuma, see January 03, 2013 Map. After analyzing the area's topography and minimizing the amount of impacts to protected resources and existing properties in the surrounding area, three alignments were proposed for Segment C, see February 19, 2013 Map.

Alignment C1 provides a route that attempts to utilize as much of the existing right-of-way as possible. The route leaves existing U.S Highway 63 north of 150th St. and bends northeast to bypass New Sharon. C1 reconnects with existing U.S Highway 63 east of Merino Ave.



February 19, 2013 Study Map

and continues east to the Skunk River. The route then turns northeast to connect with existing U.S. Highway 63 at 530th Avenue, see February 19, 2013 Map. Alignment C2 was designed to provide a more direct route option. The route starts at 150th St. and continues northeast to connect with existing U.S Highway 63 north of 105th St. C2 provides the option of connecting with existing U.S Highway 63 or providing a Segment D option of bypassing Montezuma. C3 provides an alignment option around New Sharon starting before 150th St., but otherwise following the same alignment as C1 at 120th St.

Segment D

Segment D reviews alternatives to the existing U.S. Highway 63 route going through the City of Montezuma. Since there are significant constraints in upgrading existing U.S. Highway 63 to a 4-lane cross section through the City, alternatives bypassing west and east of the City were proposed, see January 03, 2013 Map. Alignment D2 was proposed with the intention of utilizing the most of the existing alignment. D2 follows the existing U.S. Highway 63 route until 510th Street, where the alignment bends to the east side of Montezuma. The D3 alignment is the continuation of C2, which aligns east of Montezuma. Both D2 and D3 include a proposed interchange on the east side of Montezuma. This location allows for Montezuma to gain potential developmental expansion east of the City. From there, both D2 and D3 have the same alignment that bends north of Montezuma and connects with existing U.S. Highway 63 at approximately 450th Avenue. Providing an alignment option around the west side of Montezuma, which is a more direct route from a regional perspective, requires more detailed analysis. There are two lakes west of Montezuma. One is a Poweshiek County Park, the other is Lake Ponderosa, a lake community with homes lining the shoreline. It would not be feasible for an alignment to directly impact either of these lakes, so the only available option is to pass between them. Alignment D1 is proposed very specifically with topography in mind. The alignment also follows a major overhead transmission line. An interchange

is envisioned to connect U.S Highway 63 to Diamond Trail Road. Diamond Trail Road would overpass the new U.S. Highway 63 alignment. U.S. Highway 63 north of Diamond Trail would be designed low in the topography, so homes around Lake Ponderosa would be shielded from the view and potential noise from the highway. D1 will then reconnect with the existing U.S. Highway 63 at 470th Avenue. Alignment D1 has potentially significant impacts to the area, which would require additional study to determine the feasibility and appropriateness of the impacts to provide a direct route.

Segment E

Segment E follows existing U.S. Highway 63 from north of Montezuma to Interstate 80 and the City of Malcom. Since the existing route is direct, and ends at the existing Interstate 80/U.S. Highway 63 interchange, only one alignment alternative is proposed for this segment.

Segment F

The Segment F is the final segment of the "east" alternative and includes from Interstate 80, through the City of Malcom, north to U.S. Highway 6. Once again, the effectiveness of U.S. Highway 63 is challenged by a portion of the route through town. In this case, the location of the existing interchange almost requires U.S. Highway 63 to pass through another town. However, there is only 66 feet of right-of-way through the developed area, and impacts of an improved highway on existing alignment would be significant. In addition, the Iowa Interstate Railroad generally parallels Interstate 80 and crosses existing U.S. Highway 63. A highway overpass on existing alignment would also create significant impacts.

Bypass options both east and west of Malcom were considered. The western alignment would require a severe horizontal curve to bend west along the existing railway. There are current plans for additional industrial spur track construction in that location as well. Alignment F1 follows this route to an area just west of 110th Street, where a bridge overpass of the railroad appears feasible. From there, alignment F1 follows the existing topography to connect with existing U.S. Highway 63 north of U.S. Highway 6. F2 is the envisioned east bypass route. The Malcom water treatment plant is directly southeast of the developed area, and curvature and profile would again be challenging. An alignment between Dayton Meat Products and Malcom's water treatment plant was proposed. Alignment F2 then proceeds directly north until 400th Avenue, until it bends northwest to connect with existing U.S. Highway 63 by Martin Marietta Aggregates, see February 19, 2013 Map.

Segment G

Another potential route for U.S. Highway 63 from New Sharon to U.S. Highway 6 would follow Iowa Highway 146 north of New Sharon, then continue north on new alignment, either to a new interchange with Interstate 80 and north to U.S. Highway 6, or east to existing U.S. Highway 63. The southern end of this "west" option would start with a western bypass of New Sharon to connect existing U.S. Highway 63 south of New Sharon to Iowa Highway 146 north of New Sharon. This area, and the portion that would follow Iowa Highway 146 was designated Segment G, see February 19, 2013 Map. Segment G begins south of New Sharon, then heads northwest just far enough west of New Sharon so a potential interchange with Highway 102 would be feasible. From Iowa Highway 102, alignment G heads northeast to connect with Iowa Highway 146. There is currently an existing at-grade railroad crossing of Iowa Highway 146 just south of a river bridge. A new bridge is proposed west of the existing bridge. It would span both the river and railroad. The route then follows existing Iowa Highway 146 until 502nd Ave. The alignment turns northeast, and Segment G ends north of Diamond Trail Road.

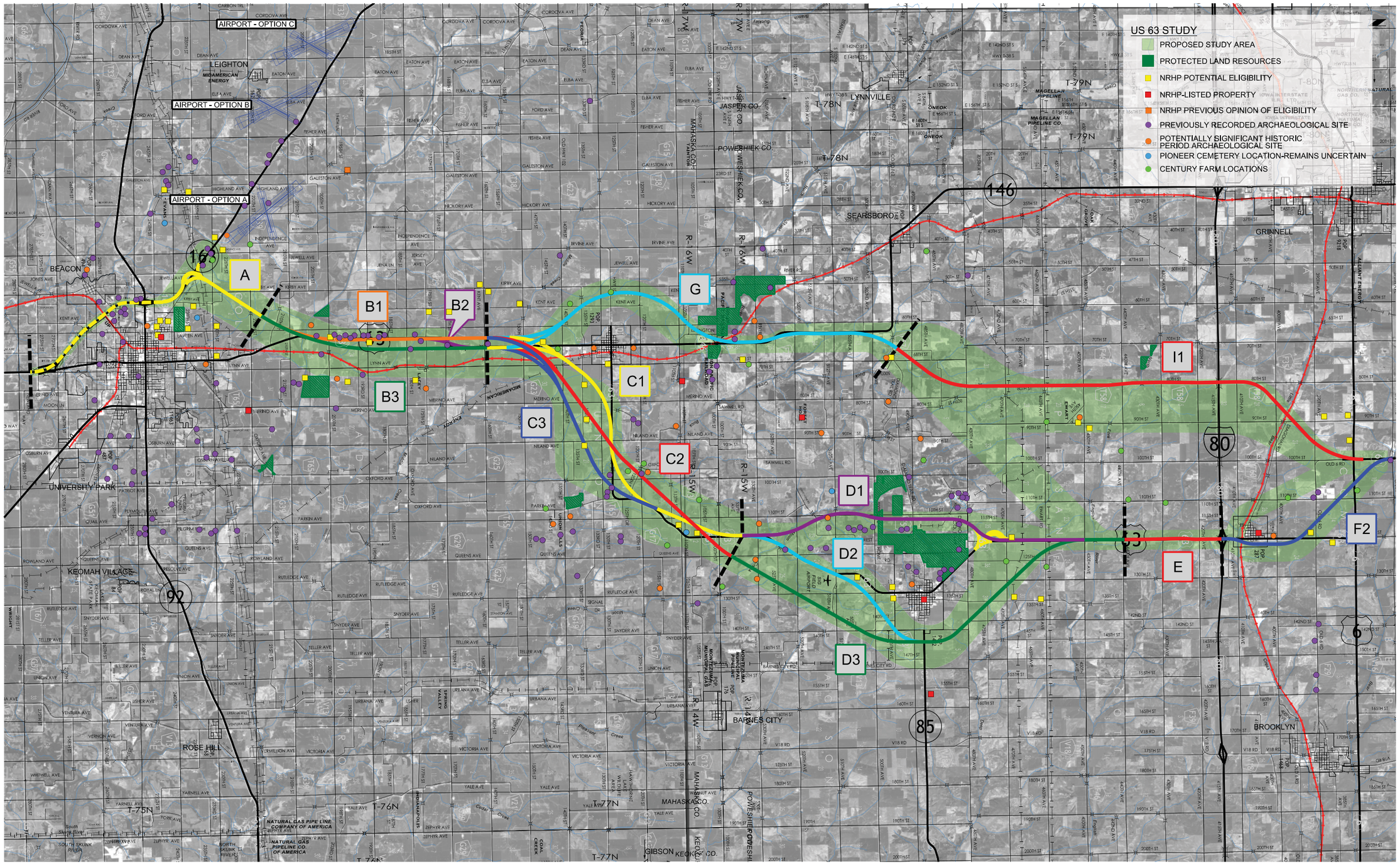
Segment H

Segment H would be the alignment to return to existing U.S. Highway 63 from Iowa Highway 146, see January 03, 2013 Map. Alignment H starts where Segment G ends and follows a direct, but diagonal route that reasonably follows the topography and avoids impacts. Alignment H matches up with the existing U.S. Highway 63 alignment and ends at 440th Ave.

Segment I

Segment I includes alignment alternatives for a new U.S. Highway 63 from Iowa Highway 146 to U.S. Highway 6, see October 29, 2012 Map. In general, two alignments alternatives were envisioned, each would be spaced at three and four miles, respectively, from the existing U.S. Highway 63 interchange on Interstate 80. With this consideration in mind, Alignments I1 and I2 were proposed, see February 19, 2013 Map. From the end of Segment G, I1 will continue northeast to existing 80th Street. To avoid some of the potential resident relocations in the area, I1 would begin on the east side of 80th St., and then switch to the west side around 440th Ave. I1 will continue north toward I-80, and then bend northeast toward the U.S. Highway 6 and U.S. Highway 63 intersection. I2 is one mile farther northeast and connects to 90th Street. I2's alignment does not initially match up with existing 90th Street to avoid a Mid-American Energy substation, and the town of Ewart along the roadway. I2 bends to the east of the existing roadway and travels parallel to it until 430th Ave. I2 continues north until just past I-80 where it turns northeast and eventually connects with existing U.S. Highway 63 north of U.S. Highway 6.

After an initial review of the alignments, it became clear that alignments F1, H, and I2 could be eliminated without going through the entire evaluation process. Alignment F1 was eliminated because it is not possible to have a proper, at-speed horizontal curve between the Interstate 80 interchange and the railroad tracks through the City of Malcom. Alignment H was eliminated for the out-of-distance travel incurred from going west of New Sharon and then bending back east to existing U.S. Highway 63 north of Montezuma. Alignment I2 was eliminated, since I1 used more existing roadway right of way, and had a more suitable interchange location on Interstate 80. The alignment alternatives map was updated to the March 13, 2013 Map shown to the right.



MARCH 13, 2013 STUDY MAP

SECTION 4 ALIGNMENT ALTERNATIVES

Alternatives Evaluation

To accomplish the ultimate purpose of the U.S. Highway 63 Corridor Location Study, it is necessary to evaluate each of the alternatives that have been identified. In addition to the primary goals introduced in Section 2.5, there are several criteria that can be compared between alternatives. To evaluate the alternatives with each criteria, there are a number of factors that should be considered for a transportation facility. For this Corridor Location Study, the factors included roadway characteristics as well as environmental impacts associated with the NEPA process. The pre-NEPA factors were not studied in great detail to determine actual impacts, but rather broadly reviewed to highlight potential impacts for further study as improvements are planned and designed.

5.1 Criteria

Route Performance

The following factors are related to how well a transportation facility provides for the needs of the traveling public.

Time of Travel

This factor measures the amount of time it would take to drive each of the proposed alignment segments. The shorter segments that have fewer stop and go situations will generally have a lower travel time. To evaluate the build alternatives, a constant design speed of 60 mph was utilized. To determine the time of travel on the existing route, four travel time runs were run in March 2012. The average travel time observed for the existing corridor from U.S. Highway 63 south of Oskaloosa to U.S. Highway 6 north of Malcom was approximately 52 minutes. This is approximately 12 minutes longer than the projected travel times of the study alternatives calculated at 38 min for the West Alignment and 40 minutes for the East Alignment. The proposed alternative with the lowest travel time is ranked higher than alternatives with higher travel times.

Highway Speed Maintained

One of the goals of an improved transportation route is to allow traffic to maintain a constant speed. By eliminating reduced speed zones and stop and go situations on through-town routes, all of the build alternatives equally provide the opportunity for traffic to maintain highway speed.

Out of Distance Travel

This factor is used to determine the extra distance required to get from point A to point B. This is calculated by measuring the length of the segment and subtracting the straight line distance from point A to point B. The segment with the highest distance value has the longest out of distance travel. The segments with the shortest of out-of-distance travel length received the highest scores.

Annual User Cost for Out-of-Distance Travel

This criterion takes the information from the Out of Distance Travel and assigns a cost to the intended users of the facility. Some of the items that are considered are amount of gas needed, extra wear on vehicle, and the extra time it would take to get to their intended destination.

In scoring this criterion it was determined it would be difficult to come up with a monetary value of the cost accrued by the length of out-of-distance travel. This criteria used the user's time as a metric as a form of cost. The alignments with the most out-of-distance travel would take longer to drive, which would lead to the intended users of the facility to spend more of their time driving. For scoring this criterion, the routes with the longest time spent traveling the out-of-distance length received the lower scores.

Economic Vitality

The following factors are related to how well a transportation facility serves the economic growth of the region.

Economic Development

This factor measures the potential for economic development along the proposed alignments. The likelihood that a proposed alignment will provide future economic growth for an area is major incentive to consider funding for the proposed transportation facility. The ranking for this factor was determined by evaluating the location of the alignment. If the alignment was positioned in a location that would provide a growth area or opportunity for residential, commercial, or industrial development, the alignment would receive a higher score.

Local Road Network Impact

When a new highway facility is proposed, the surrounding road network will be affected. A local road will often have to be re-aligned to accommodate the new facility. As shown on the segment maps included later in this section, the proposed improvements to U.S. Highway 63 will involve areas of Priority I and III access. The scoring for this factor was based on the following impact scenarios: an interchange or an improved at-grade intersection would be established with U.S. Highway 63, an overpass or underpass would be constructed over the local road with no access to U.S. Highway 63, or the local road would be closed completely. Since road closures have the worst impact on the local road network, that option receives the lowest score. An interchange or at-grade intersection would create the least impact and receives the highest score. The overall impact of a segment is determined by a summation of all of the impacts and then is compared with the other segments.

Regional Connectivity

This factor determines how well a new transportation facility serves traffic with an origin or destination outside of the immediate study area. Considerations for this factor include overall ease of travel along the alignment, distance, and connectivity to other routes.

Intermodal Opportunities

This factor is used to determine how well a new transportation facility provides for intermodal opportunities within the region. Rail, air, and water transportation are all considered for scoring purposes. The alternative that was best located to provided the most intermodal opportunities received the highest score.

Economic Consequences

The following factors are related to the indirect cost of a new transportation facility, with an emphasis on potential impacts to the economy.

Diagonal Severance

This factor was utilized to compare the impacts of a segment as a new highway traversing diagonally through a parcel. If the roadway causes the remaining land to be unusable for farming or for future development, the parcel will be considered a severance management zone. For purposes of alternative evaluation in this study, the length of potential diagonal severance was measured. The segments with the shortest length of potential diagonal severance were scored the highest.

Land Use Impact

Three criteria were used to determine the potential land use impact for each alternative: the area of land used for construction of the roadway, the area of farmland made un-farmable from diagonal severance, and the potential for economic growth provided by the location of the roadway. Those criteria were evaluated and tabulated separately and the segments each received a rank. The three rankings were combined for the alignments, and the segment with the highest ranking received the highest score for this factor.

Relocations (Residential and Commercial)

This factor is used to determine the potential impact of displacing people or businesses. Existing buildings were avoided as much as possible when the alignment alternatives were first established. Any houses or businesses that are within the potential construction limits or were significantly close to the construction limits were considered impacted by a possible relocation. The segments with the fewest relocations were given the highest scores.

Energy Consumption

Energy consumption is considered for both the duration of project construction and as a resultant cost of the project to the intended users. The alternatives with the longest distance will require more energy to construct and to traverse. The alternatives with the shortest distance received the higher scores.

Agriculture

Agribusiness plays a vital role in the East Central Iowa area economy and it is important to avoid conversion of farmland to nonagricultural uses. This factor evaluates the impact of a new highway on farmland, especially on segments where diagonal severance is a concern. Based on established guidelines, areas less than two acres are considered unsuitable for farming. The metric for this factor was determined by measuring the total area of farmland lost due to the roadway and any diagonal severance creating a remainder of a parcel less than two acres in area. The segments with the lowest area of impacted farmland were given the highest scores.

Fundability

The following factors are related to the feasibility of constructing the proposed improvements.

Construction Cost

The construction cost of each segment was estimated based on the classification and length of the proposed improvements. The quantities of several major work items were estimated including the volume of earthwork, area of pavement, number of large culverts, number and size of bridges, and the area of right-of-way needed to construct the project. The earthwork and pavement quantities were determined by cross-sections generated in Microstation, a computer-aided-drafting software. An estimate of how many culverts and bridges would be required was determined by counting significant water crossings shown on Iowa Geographical Maps. Mapping available on the Mahaska and Poweshiek County Assessors websites was used to view the parcel lines and determine the area of existing right-of-way along the proposed alignments. This area was subtracted from the total area of proposed right-of-way to develop the estimated cost of right-of-way acquisition. The segment with the lowest construction cost receives the highest score.

Phased Improvement Opportunities

This factor evaluates the ability to construct proposed improvements in multiple phases. Phasing of improvements is important because it allows the construction of the new transportation facility to be split into projects of a feasible size for funding, construction, and transition purposes. The segment that provides the most phased opportunities received the highest score.

Connectivity to Existing ROW

The ability to use existing right-of-way is an important factor when planning a new transportation facility. It is not only less expensive when existing right-of-way is available, but there are also more potential phased improvement opportunities for the project and fewer impacts to adjacent property owners. When utilizing existing right-of-way, a proposed roadway project is more feasible than if it traverses through farmland and forested area. For the purposes of segment comparison, the metric for this factor was calculated by measuring the length of existing right-of-way in Microstation. The segment utilizing the longest length of existing right-of-way received the highest score.

Societal Impact

The following factors are related to the indirect impacts that a new transportation facility will have on the people who are closest to it.

Proximity to US 63

The overall purpose of the U.S. Highway 63 Corridor Location Study is to determine the preferred highway route for future improvements. Emphasis is on providing alternatives that utilize the existing U.S. Highway 63 route. When comparing the proposed alternatives, a higher score is given to alignment segments that use or are closest to the existing U.S. Highway 63 corridor.

Avoidance of Century Farms

The honor of Century Farm designation in the State of Iowa is only bestowed upon certain land owners. The land must have consecutive ownership within the same family with at least 40 acres of the original holding of Iowa farmland for 100 years or more. The present land owner must be related to the person who owned the same land 100 years ago. The honor of a Century Farm is very unique and provides landowners with a sense of heritage pride, so there is an emphasis on designing around these farms when possible. This was considered when establishing alignment alternatives for the U.S. Highway 63 Corridor Location Study. The segments that have the least adverse impact on Century Farms received the highest scores.

Conflict Points/Predicted Safety

One of the most important aspects of designing a transportation facility is to ensure that it will be safe for the intended users. It is important to use data such as traffic accident reports to determine problem areas on an existing roadway. For this study, the Crash Mapping Analysis Tool (CMAT) 3.7 software, produced by Iowa DOT was used to evaluate crash data on the existing U.S. Highway 63 corridor. The Highway Safety Manual (1st Edition), released by AASHTO in 2011, was used to evaluate the predicted safety for the proposed alignment segments. The alignment routes with the best predicted safety received the higher scores.

The Highway Safety Manual (1st Edition), released by AASHTO in 2011 was utilized to compare the two corridor alignment alternatives for differences in predictive safety expressed by crash frequency and crash severity. This method provides base equations for crash frequency for specific types of corridors due exposure variables of traffic volume and segment length. This base crash frequency value is then modified by Crash Modification Factors (CMFs) that have been determined through summary of highway safety research to increase or decrease crash frequency. These crash modification factors are based on design criteria such as lanes, lane width, shoulder and median type and width, and roadside barriers and slope. Spreadsheets are used to calculate crash frequency and severity for the east and west alignment alternatives.

As described in the Appendix, the results of this analysis showed little difference between the two alternatives for Year 2040, with 35 crashes per year predicted for the east alternative and 36 crashes per year for the west. This conclusion makes sense as the alignments share design criteria and similar traffic volume with the west alignment having a slightly longer length.

Community Impacts

This factor is used to evaluate the potential for a community to be bisected with a new highway. It accounts for the possibility of separating historical resources, parks, recreational facilities, and the availability of affordable housing within a community. When evaluating the segments on this factor, it was found that community separation occurred only once within the study area, where Segment D1 separates the area around Lake Ponderosa and Diamond Lake from the rest of Montezuma.

Environmental Justice

It is important in the design process to take minority and/or low-income populations into account. This helps ensure that factors such as adverse human health or environmental effects of a transportation project will not fall disproportionately on just one social or cultural group of the surrounding population. The alignment alternatives identified for the U.S. Highway 63 corridor will not adversely impact any particular population more than another, therefore all segments scored equally.

Visual Impacts

This factor evaluates how users of the highway facility will react to the view along the roadway. It also evaluates how the new facility will affect the view of individuals who live near it. The metric for this factor is the number of houses and commercial buildings that will be located adjacent to the new highway. An offset of 400 feet from the centerline of the outermost lane was used. This was the same distance that was used to determine how many noise receptors were adjacent to the segments, as discussed below. Any houses or commercial buildings within the 400 foot buffer were counted as a receptor. The segments with the fewest receptors received the highest scores.

Air Quality

The Federal Clean Air laws identify the requirements that must be followed in designing a new transportation facility. This helps ensure that the new facility will not cause and/or contribute air quality problems to the surrounding area. The purpose of improvements to U.S. Highway 63 is to provide a north-south transportation corridor that allows users to maintain their speed along the entire route. While this will help to mitigate any existing air quality issues along the current route, a comparison between new routes is still warranted. For the purpose of this study, the metric for Air Quality is the length of the segment. The segments with the shortest distance would produce less air pollution, and received the highest scores.

Noise

Noise from highway traffic is factored into the design process for a new transportation facility. This is to determine if any noise abatement measures are needed for the proposed project. For scoring the segments in this study, any residential buildings that were within the 400 ft sound barrier were counted as a sound receptor. The alignments with the fewest receptors received the highest scores.

Regulated Material

It was determined from a preliminary study that no regulated material sites will be impacted by the roadway improvements, so this factor was not utilized in the scoring process of the study.

Cultural Resources

This factor is intended to evaluate the potential for protection of cultural resources within the study area. Cultural resources include structures, landscapes, districts, and other objects that are at least 50 years old, and a community or culture has associated it with being scientific, traditional, religious, or another distinction. For the U.S. Highway 63 Corridor Location Study, a Historical and Architectural Reconnaissance Study and a Phase IA Archaeological Assessment were completed to determine the location of cultural resources within the study area, refer to the Appendix for reports. The segments that impacted the fewest potential cultural resources were scored the highest.

Natural Environmental Impacts

The following factors are related to the natural environment and potential impacts of a new transportation facility.

Surface Water/Water Quality

This factor evaluates the protection of the quality of surface water resources. For the purpose of this study, the number of significant surface water crossings were counted. The segments with the fewest water crossings scored the highest.

Wetlands

Areas that are designated wetlands should be avoided, or impacts to the surrounding habitat and water quality should be minimized as much as possible. A windshield survey and review of National Wetland Inventory (NWI) maps were completed to determine potential locations of wetlands within the study area, refer to the Appendix for a map of these locations. Wetlands were avoided when possible as the alignment alternatives were being established for this study. The alternatives with the least impact to wetland areas were scored the highest.

Special River Designations

Rivers or streams given special waterway designations from the National Rivers Inventory (NRI) or the Iowa Protected Water Area (PWA) program are to be avoided. The proposed alignment alternatives for U.S. Highway 63 do not cross any specially designated rivers or streams, so this factor was not utilized in the scoring process of the study.

Floodplains/Hydraulics

The areas that are designated as floodplains should be avoided for construction to help maintain existing flood characteristics. These areas were avoided when possible as the alternative alignments were established for this study. The alignment alternatives with the smallest area of floodplain interference were scored the highest. Since Poweshiek County does not have a Flood Insurance Rate Map (FIRM), only Mahaska County floodplain areas were counted for scoring purposes.

Threatened & Endangered Species

There are certain species of plant and animals in each state that retain special protection per state or federal regulations. The Fish and Wildlife Service states that the Indiana Bat is the only threatened or endangered species within the U.S. Highway 63 study area, in Mahaska and Poweshiek Counties. A more in-depth environmental study will need to be performed as construction projects are programmed to conclude if the species is located within the project area. For the purpose of this study, areas of heavy trees were considered potential habitat and the segment that best avoided those areas were scored the highest.

Section 4(f) Property

The Department of Transportation Act (DOT Act) of 1966 included a clause that does not allow the Federal Highway Administration (FHWA) or DOT agencies to disturb the use of land set aside for public use. This includes publicly owned parks, recreational areas, wildlife and waterfowl refuges, and private and public historical sites. There are two exceptions to this clause: if there is no feasible or prudent alternative to the use of the land, and if all possible measures are taken to minimize the harm to the property resulting from use. This guideline was followed very closely in the determination of possible alignment alternatives for a new U.S. Highway 63 corridor. As a result, only one alternative passes through a very narrow portion of a public park. This segment was given a lower score in comparison with segments that avoided any Section 4(f) Property impacts.

5.2 Method of Evaluation

The factors described above created the foundation for evaluating the alternatives. Every factor was assigned a metric that would be used to compare the alternatives against each other. A weight was also assigned to each factor to illustrate its importance in the overall evaluation. Once the metrics were computed for each factor, the alternatives were given a rank, based on how they compared with the other alternatives. This rank was then multiplied by the weight to establish a score for that factor. A summation of the scores for each alternative was calculated and provides the basis for the final evaluation results.

The evaluation was first done by segment, to determine the best overall alignment created by combining the segments. The evaluation tables for the segments are included on the following pages.

The segment evaluation concluded with a determination of the preferred West Alignment and the preferred East Alignment, as shown on the map at the end of this section. The subsequent evaluation of the West and East Alignments follows in Section 6.

SEGMENT B Alternatives Scoring Analysis

Evaluation Criteria		Segment Options											
ROUTE PERFORMANCE	Weight	B1				B2				B3			
		Metrics	Value	Rankings	Score	Metrics	Value	Rankings	Score	Metrics	Value	Rankings	Score
Time of Travel	5	Time (min)	5.38	2	10	Time (min)	5.41	2	10	Time (min)	5.41	2	10
Highway Speed Maintained	4	Time (speed)	60	2	8	Time (speed)	60	2	8	Time (speed)	60	2	8
Out of Distance Travel	5	Distance (miles)	0.45	2	10	Distance (miles)	0.45	2	10	Distance (miles)	0.44	2	10
Annual User Cost for Out-of-Distance Travel	4	Time (min)	0.45	2	8	Time (min)	0.45	2	8	Time (min)	0.44	2	8
Average Weight	4.5												
Total					36				36				36
Average					9				9				9

Evaluation Criteria		Segment Options											
ECONOMIC CONSEQUENCES	Weight	B1				B2				B3			
		Metrics	Value	Rankings	Score	Metrics	Value	Rankings	Score	Metrics	Value	Rankings	Score
Diagonal Severance	3	Potential Distance (miles)	1.57	2.5	7.5	Potential Distance (miles)	1.57	2.5	7.5	Potential Distance (miles)	2.59	1	3
Pre-NEPA Considerations*													
Land Use Impact	2	H/M/L	M	2.5	5	H/M/L	M	2.5	5	H/M/L	L	1	2
Relocations (Residential & Commercial)	2	# of Relocations	6	1.5	3	# of Relocations	6	1.5	3	# of Relocations	2	3	6
Energy Consumption	3	Distance (miles)	5.38	2	6	Distance (miles)	5.41	2	6	Distance (miles)	5.41	2	6
Agriculture	2	Acres	154	2.5	5	Acres	145	2.5	5	Acres	181	1	2
Average Weight	2.4												
Total					26.5				26.5				19
Average					5.3				5.3				3.8

Evaluation Criteria		Segment Options											
ECONOMIC VITALITY	Weight	B1				B2				B3			
		Metrics	Value	Rankings	Score	Metrics	Value	Rankings	Score	Metrics	Value	Rankings	Score
Economic Development	5	H/M/L	H	2	10	H/M/L	H	2	10	H/M/L	H	2	10
Local Road Network Impact	4	# of Impacts	2	2	8	# of Impacts	2	2	8	# of Impacts	2	2	8
Regional Connectivity	5	H/M/L	H	2	10	H/M/L	H	2	10	H/M/L	H	2	10
Intermodal Opportunities	5	H/M/L	H	2	10	H/M/L	H	2	10	H/M/L	H	2	10
Average Weight	4.75												
Total					38				38				38
Average					9.5				9.5				9.5

Evaluation Criteria		Segment Options											
SOCIETAL IMPACT	Weight	B1				B2				B3			
		Metrics	Value	Rankings	Score	Metrics	Value	Rankings	Score	Metrics	Value	Rankings	Score
Proximity to US 63	5	H/M/L	M	2	10	H/M/L	H	3	15	H/M/L	L	1	5
Avoidance of Century Farms	1	#	N/A	3	3	#	N/A	3	3	#	N/A	3	3
Conflict Points/Predicted Safety	3	# of Accidents/Severity	-	2	6	# of Accidents/Severity	-	2	6	# of Accidents/Severity	-	2	6
Pre-NEPA Considerations*													
Community Impacts	3	# of Separations	N/A	3	9	# of Separations	N/A	3	9	# of Separations	N/A	3	9
Environmental Justice	2	H/M/L	L	2	4	H/M/L	L	2	4	H/M/L	L	2	4
Visual Impacts	2	# of Receptors	N/A	2	4	# of Receptors	N/A	2	4	# of Receptors	N/A	2	4
Air Quality	1	Distance (miles)	5.38	2	2	Distance (miles)	5.41	2	2	Distance (miles)	5.41	2	2
Noise	2	# of Receptors	1	2.5	5	# of Receptors	1	2.5	5	# of Receptors	2	1	2
Regulated Material	1	**Preliminary study indicates that no Regulated Material Sites will be impacted by roadway improvements**											
Cultural Resources	2	#	3	2	4	#	4	1	2	#	0	3	6
Average Weight	2.2												
Total					47				50				41
Average					4.7				5				4.1

Evaluation Criteria		Segment Options											
FUNDABILITY	Weight	B1				B2				B3			
		Metrics	Value	Rankings	Score	Metrics	Value	Rankings	Score	Metrics	Value	Rankings	Score
Construction Cost	4	$	M	2.5	10	$	M	2.5	10	$	H	1	4
Phased Improvement Opportunities	5	H/M/L	M	2	10	H/M/L	H	3	15	H/M/L	L	1	5
Connectivity to Existing ROW	4	Distance (miles)	3.161	2	8	Distance (miles)	4.263	3	12	Distance (miles)	1.141	1	4
Average Weight	4.3												
Total					28				37				13
Average					9.3				12.3				4.3

Evaluation Criteria		Segment Options											
NATURAL ENVIRO. IMPACTS	Weight	B1				B2				B3			
		Metrics	Value	Rankings	Score	Metrics	Value	Rankings	Score	Metrics	Value	Rankings	Score
Pre-NEPA Considerations*													
Surface Water/Water Quality	1	# of Crossings	3	2.5	2.5	# of Crossings	3	2.5	2.5	# of Crossings	5	1	1
Special River Designations	1	**Not Applicable - No Special River Designations in Iowa.**											
Wetlands	1	Acres	2.29	2	2	Acres	2.29	2	2	Acres	2.29	2	2
Floodplains/Hydraulics	1	Acres	26.83	2.5	2.5	Acres	24.83	2.5	2.5	Acres	32.98	1	1
Threatened & Endangered Species	2	Habitat Acres	4.4	2.5	5	Habitat Acres	4.4	2.5	5	Habitat Acres	6.35	1	2
Section 4(f) Property	3	Acres	N/A	2	6	Acres	N/A	2	6	Acres	N/A	2	6
Average Weight	1.5												
Total					18				18				12
Average					3				3				8

FINAL COMPARISON	B1	B2	B3
Segment Total Score	**193.5**	**205.5**	**159**
Segment Average Score	**40.8**	**44.1**	**38.7**

*Factors identified for Pre-NEPA consideration are resources protected by Federal Legislation. For purposes of this study, preliminary field surveys and literature searches have provided information toward the potential presence of these resources in the study corridor. Exact impacts will be addressed by future NEPA studies on standalone projects within the corridor. Efforts have been made to avoid these resources during the layout of the alignment options. However, the potential for impacts should be considered in the selection process.

SEGMENT C Alternatives - Scoring Analysis

Evaluation Criteria		Segment Options											
ROUTE PERFORMANCE	Weight	C1				C2				C3			
		Metrics	Value	Rankings	Score	Metrics	Value	Rankings	Score	Metrics	Value	Rankings	Score
Time of Travel	5	Time (min)	9.15	2	10	Time (min)	8.52	2	10	Time (min)	8.75	2	10
Highway Speed Maintained	4	Time (speed)	60	2	8	Time (speed)	60	2	8	Time (speed)	60	2	8
Out of Distance Travel	5	Distance (miles)	1.01	1	5	Distance (miles)	0.27	3	15	Distance (miles)	0.61	2	10
Annual User Cost for Out-of-Distance Travel	4	Time (min)	1.01	1	4	Time (min)	0.27	3	12	Time (min)	0.61	2	8
Average Weight	4.5												
Total					27				45				36
Average					6.8				11.3				9

Evaluation Criteria		Segment Options											
ECONOMIC CONSEQUENCES	Weight	C1				C2				C3			
		Metrics	Value	Rankings	Score	Metrics	Value	Rankings	Score	Metrics	Value	Rankings	Score
Diagonal Severance	3	Potential Distance (miles)	6.06	3	9	Potential Distance (miles)	7.86	1	3	Potential Distance (miles)	7.01	2	6
Pre-NEPA Considerations*													
Land Use Impact	2	H/M/L	M	2	4	H/M/L	H	3	6	H/M/L	L	1	2
Relocations (Residential & Commercial)	2	# of Relocations	7	1.5	3	# of Relocations	7	1.5	3	# of Relocations	5	3	6
Energy Consumption	3	Distance (miles)	9.15	2	6	Distance (miles)	8.52	2	6	Distance (miles)	8.75	2	6
Agriculture	2	Acres	180	2.5	5	Acres	164	2.5	5	Acres	223	1	2
Average Weight	2.4												
Total					27				23				22
Average					5.4				4.6				4.4

Evaluation Criteria		Segment Options											
ECONOMIC VITALITY	Weight	C1				C2				C3			
		Metrics	Value	Rankings	Score	Metrics	Value	Rankings	Score	Metrics	Value	Rankings	Score
Economic Development	5	H/M/L	M	3	15	H/M/L	H	2	10	H/M/L	L	1	5
Local Road Network Impact	4	# of Impacts	2	1.5	6	# of Impacts	1	3	12	# of Impacts	2	1.5	6
Regional Connectivity	5	H/M/L	M	1	1.5	H/M/L	H	3	15	H/M/L	M	1.5	7.5
Intermodal Opportunities	5	H/M/L	H	2	10	H/M/L	H	2	10	H/M/L	H	2	10
Average Weight	4.75												
Total					32.5				47				28.5
Average					8.1				11.8				7.1

Evaluation Criteria		Segment Options											
SOCIETAL IMPACT	Weight	C1				C2				C3			
		Metrics	Value	Rankings	Score	Metrics	Value	Rankings	Score	Metrics	Value	Rankings	Score
Proximity to US 63	5	Distance (miles)	-	3	15	Distance (miles)	-	1	5	Distance (miles)	-	2	10
Avoidance of Century Farms	1	#	2	1.5	1.5	#	2	1.5	1.5	#	1	3	3
Conflict Points/Predicted Safety	3	# of Accidents/Severity	-	1.5	4.5	# of Accidents/Severity	-	3	9	# of Accidents/Severity	-	1.5	4.5
Pre-NEPA Considerations*													
Community Impacts	3	# of Separations	N/A	2	6	# of Separations	N/A	2	6	# of Separations	N/A	2	6
Environmental Justice	2	H/M/L	L	2	4	H/M/L	L	2	4	H/M/L	L	2	4
Visual Impacts	2	# of Receptors	N/A	2	4	# of Receptors	N/A	2	4	# of Receptors	N/A	2	4
Air Quality	1	Distance (miles)	9.15	2	2	Distance (miles)	8.52	2	2	Distance (miles)	8.75	2	2
Noise	2	# of Receptors	6	1	2	# of Receptors	4	3	6	# of Receptors	5	2	4
Regulated Material	1	**Preliminary study indicates that no Regulated Material Sites will be impacted by roadway improvements**											
Cultural Resources	2	#	0	3	6	#	1	2	4	#	3	1	2
Average Weight	2.2												
Total					45				41.5				39.5
Average					4.5				4.2				4.0

Evaluation Criteria		Segment Options											
FUNDABILITY	Weight	C1				C2				C3			
		Metrics	Value	Rankings	Score	Metrics	Value	Rankings	Score	Metrics	Value	Rankings	Score
Construction Cost	4	Distance (miles)	L	3	12	Distance (miles)	H	1	4	Distance (miles)	M	2	8
Phased Improvement Opportunities	5	H/M/L	H	3	15	H/M/L	L	1	5	H/M/L	M	2	10
Connectivity to Existing ROW	4	Distance (miles)	2.318	3	12	Distance (miles)	0.628	1	4	Distance (miles)	1.4	2	8
Average Weight	4.3												
Total					39				13				26
Average					13.0				4.3				8.7

Evaluation Criteria		Segment Options											
NATURAL ENVIRO. IMPACTS	Weight	C1				C2				C3			
		Metrics	Value	Rankings	Score	Metrics	Value	Rankings	Score	Metrics	Value	Rankings	Score
Pre-NEPA Considerations*													
Surface Water/Water Quality	1	# of Crossings	3	3	3	# of Crossings	5	1	1	# of Crossings	4	2	2
Special River Designations	1	**Not Applicable - No Special River Designations in Iowa.**											
Wetlands	1	Acres	7.19	2.5	2.5	Acres	11.44	1	1	Acres	7.82	2.5	2.5
Floodplains/Hydraulics	1	Acres	25.52	2	2	Acres	44.59	1	1	Acres	21.38	3	3
Threatened & Endangered Species	2	Habitat Acres	17.89	2	4	Habitat Acres	27.84	1	2	Habitat Acres	9.02	3	6
Section 4(f) Property	3	Acres	N/A	2	6	Acres	N/A	2	6	Acres	N/A	2	6
Average Weight	1.5												
Total					17.5				11				19.5
Average					2.9				1.8				3.3

*Factors identified for Pre-NEPA consideration are resources protected by Federal Legislation. For purposes of this study, preliminary field surveys and literature searches have provided information toward the potential presence of these resources in the study corridor. Exact impacts will be addressed by future NEPA studies on standalone projects within the corridor. Efforts have been made to avoid these resources during the layout of the alignment options. However, the potential for impacts should be considered in the selection process.

FINAL COMPARISON	C1	C2	C3
Segment Total Score	**188**	**180.5**	**171.5**
Segment Average Score	**40.7**	**37.8**	**36.1**

SEGMENT D Alternatives - Scoring Analysis

Evaluation Criteria		Segment Options											
ROUTE PERFORMANCE	Weight	D1				D2				D3			
		Metrics	Value	Rankings	Score	Metrics	Value	Rankings	Score	Metrics	Value	Rankings	Score
Time of Travel	5	Time (min)	10.08	3	15	Time (min)	11.68	1.5	7.5	Time (min)	11.60	1.5	7.5
Highway Speed Maintained	4	Time (speed)	60	2	8	Time (speed)	60	2	8	Time (speed)	60	2	8
Out of Distance Travel	5	Distance (miles)	0.26	3	15	Distance (miles)	1.86	1	5	Distance (miles)	1.49	2	10
Annual User Cost for Out-of-Distance Travel	4	Time (min)	0.26	3	12	Time (min)	1.86	1	4	Time (min)	1.49	2	8
Average Weight	4.5												
Total					50				24.5				33.5
Average					12.5				6.1				8.4

Evaluation Criteria		Segment Options											
ECONOMIC VITALITY	Weight	D1				D2				D3			
		Metrics	Value	Rankings	Score	Metrics	Value	Rankings	Score	Metrics	Value	Rankings	Score
Economic Development	5	H/M/L	L	1	5	H/M/L	H	3	15	H/M/L	M	2	10
Local Road Network Impact	4	# of Impacts	1	3	12	# of Impacts	2	1.5	6	# of Impacts	2	1.5	6
Regional Connectivity	5	H/M/L	H	3	15	H/M/L	L	1	5	H/M/L	M	2	10
Intermodal Opportunities	5	H/M/L	H	2	10	H/M/L	H	2	10	H/M/L	H	2	10
Average Weight	4.75												
Total					42				36				36
Average					10.5				9				9

Evaluation Criteria		Segment Options											
FUNDABILITY	Weight	D1				D2				D3			
		Metrics	Value	Rankings	Score	Metrics	Value	Rankings	Score	Metrics	Value	Rankings	Score
Construction Cost	4	$	M	2	8	$	L	3	12	$	H	1	4
Phased Improvement Opportunities	5	H/M/L	M	2	10	H/M/L	H	3	15	H/M/L	L	1	5
Connectivity to Existing ROW	4	Distance (miles)	4.00	2.5	10	Distance (miles)	4.24	2.5	10	Distance (miles)	1.55	1	4
Average Weight	4.3												
Total					28				37				13
Average					9.3				12.3				4.3

*Factors identified for Pre-NEPA consideration are resources protected by Federal Legislation. For purposes of this study, preliminary field surveys and literature searches have provided information toward the potential presence of these resources in the study corridor. Exact impacts will be addressed by future NEPA studies on standalone projects within the corridor. Efforts have been made to avoid these resources during the layout of the alignment options. However, the potential for impacts should be considered in the selection process.

Evaluation Criteria		Segment Options											
ECONOMIC CONSEQUENCES	Weight	D1				D2				D3			
		Metrics	Value	Rankings	Score	Metrics	Value	Rankings	Score	Metrics	Value	Rankings	Score
Diagonal Severance	3	Potential Distance (miles)	4.17	3	9	Potential Distance (miles)	6.29	2	6	Potential Distance (miles)	8.56	1	3
Pre-NEPA Considerations*													
Land Use Impact	2	H/M/L	M	2	4	H/M/L	H	3	6	H/M/L	L	1	2
Relocations (Residential & Commercial)	2	# of Relocations	8	2	4	# of Relocations	13	1	2	# of Relocations	5	3	6
Energy Consumption	3	Distance (miles)	10.08	3	9	Distance (miles)	11.68	1.5	4.5	Distance (miles)	11.6	1.5	4.5
Agriculture	2	Acres	219	3	6	Acres	293	1.5	3	Acres	310	1.5	3
Average Weight	2.4												
Total					32				21.5				18.5
Average					6.4				4.3				3.7

Evaluation Criteria		Segment Options											
SOCIETAL IMPACT	Weight	D1				D2				D3			
		Metrics	Value	Rankings	Score	Metrics	Value	Rankings	Score	Metrics	Value	Rankings	Score
Proximity to US 63	5	H/M/L	M	2	10	H/M/L	H	3	15	H/M/L	L	1	5
Avoidance of Century Farms	1	#	1	2	2	#	1	2	2	#	1	2	2
Conflict Points/Predicted Safety	3	# of Accidents/Severity	-	2	6	# of Accidents/Severity	-	2	6	# of Accidents/Severity	-	2	6
Pre-NEPA Considerations*													
Community Impacts	3	# of Separations	1	1	3	# of Separations	N/A	2.5	7.5	# of Separations	N/A	2.5	7.5
Environmental Justice	2	H/M/L	L	2	4	H/M/L	L	2	4	H/M/L	L	2	4
Visual Impacts	2	# of Receptors	2	1	2	# of Receptors	N/A	3	6	# of Receptors	1	2	4
Air Quality	1	Distance (miles)	10.08	3	3	Distance (miles)	11.68	1.5	1.5	Distance (miles)	11.6	1.5	1.5
Noise	2	# of Receptors	9	1	2	# of Receptors	8	2	4	# of Receptors	4	3	6
Regulated Material	1	**Preliminary study indicates that no Regulated Material Sites will be impacted by roadway improvements**											
Cultural Resources	2	#	1	2	4	#	1	2	4	#	1	2	4
Average Weight	2.2												
Total					36				50				40
Average					3.6				5				4

Evaluation Criteria		Segment Options											
NATURAL ENVIRO. IMPACTS	Weight	D1				D2				D3			
		Metrics	Value	Rankings	Score	Metrics	Value	Rankings	Score	Metrics	Value	Rankings	Score
Pre-NEPA Considerations*													
Surface Water/Water Quality	1	# of Crossings	6	3	3	# of Crossings	10	1	1	# of Crossings	8	2	2
Special River Designations	1	**Not Applicable - No Special River Designations in Iowa.**											
Wetlands	1	Acres	5.66	1	1	Acres	3.16	2	2	Acres	1.73	3	3
Floodplains/Hydraulics	1	# of crossings	6	3	3	# of crossings	10	1	1	# of crossings	8	2	2
Threatened & Endangered Species	2	Habitat Acres	66.7	1	2	Habitat Acres	10.32	3	6	Habitat Acres	20.91	2	4
Section 4(f) Property	3	Acres	5.21	1	3	Acres	N/A	2.5	7.5	Acres	N/A	2.5	7.5
Average Weight	1.5												
Total					12				17.5				18.5
Average					2				2.9				3.1

FINAL COMPARISON	D1	D2	D3
Segment Total Score	**200**	**186.5**	**159.5**
Segment Average Score	**44.3**	**39.7**	**32.5**

SEGMENT I AND H-E-F2 Alternatives - Scoring Analysis

Evaluation Criteria		Segment Options											
ROUTE PERFORMANCE	Weight	I1				I2				H-E-F2			
		Metrics	Value	Rankings	Score	Metrics	Value	Rankings	Score	Metrics	Value	Rankings	Score
Time of Travel	5	Time (min)	13.00	2.5	12.5	Time (min)	12.23	2.5	12.5	Time (min)	15.06	1	5
Highway Speed Maintained	4	Time (speed)	60	2	8	Time (speed)	60	2	8	Time (speed)	60	2	8
Out of Distance Travel	5	Distance (miles)	0.70	2	10	Distance (miles)	0.52	3	15	Distance (miles)	2.55	1	5
Annual User Cost for Out-of-Distance Travel	4	Time (min)	0.70	2	8	Time (min)	0.52	3	12	Time (min)	2.55	1	4
Average Weight	4.5												
Total					38.5				47.5				22
Average					9.6				11.9				5.5

Evaluation Criteria		Segment Options											
ECONOMIC CONSEQUENCES	Weight	I1				I2				H-E-F2			
		Metrics	Value	Rankings	Score	Metrics	Value	Rankings	Score	Metrics	Value	Rankings	Score
Diagonal Severance	3	Potential Distance (miles)	5.30	3	9	Potential Distance (miles)	10.34	2	6	Potential Distance (miles)	12.09	1	3
Pre-NEPA Considerations*													
Land Use Impact	2	H/M/L	H	3	6	Acres (area by use)	543.8	2	4	Acres (area by use)	682.22	1	2
Relocations (Residential & Commercial)	2	# of Relocations	5	3	6	# of Relocations	9	2	4	# of Relocations	17	1	2
Energy Consumption	3	Distance (miles)	13	2.5	7.5	Distance (miles)	12.23	2.5	7.5	Distance (miles)	15.06	1	3
Agriculture	2	Acres	368	3	6	Potential Distance (miles)	10.34	2	4	Potential Distance (miles)	12.09	1	2
Average Weight	2.4												
Total					34.5				25.5				12
Average					6.9				5.1				2.4

Evaluation Criteria		Segment Options											
ECONOMIC VITALITY	Weight	I1				I2				H-E-F2			
		Metrics	Value	Rankings	Score	Metrics	Value	Rankings	Score	Metrics	Value	Rankings	Score
Economic Development	5	H/M/L	L	1	5	H/M/L	M	2	10	H/M/L	H	3	15
Local Road Network Impact	4	# of Impacts	1	3	12	# of Impacts	M	2	8	# of Impacts	H	1	4
Regional Connectivity	5	H/M/L	H	3	15	H/M/L	M	2	10	H/M/L	L	1	5
Intermodal Opportunities	5	H/M/L	M	2	10	H/M/L	M	2	10	H/M/L	M	2	10
Average Weight	4.75												
Total					42				38				34
Average					10.5				9.5				8.5

Evaluation Criteria		Segment Options											
SOCIETAL IMPACT	Weight	I1				I2				H-E-F2			
		Metrics	Value	Rankings	Score	Metrics	Value	Rankings	Score	Metrics	Value	Rankings	Score
Proximity to US 63	5	H/M/L	L	1	5	H/M/L	M	2	10	H/M/L	H	3	15
Avoidance of Century Farms	1	#	N/A	3	3	#	1	1.5	1.5	#	1	1.5	1.5
Conflict Points/Predicted Safety	3	# of Accidents/Severity	L	3	9	# of Accidents/Severity	H	1	3	# of Accidents/Severity	M	2	6
Pre-NEPA Considerations*													
Community Impacts	3	# of Separations	N/A	2	6	# of Separations	N/A	2	6	# of Separations	N/A	2	6
Environmental Justice	2	H/M/L	L	2	4	H/M/L	L	2	4	H/M/L	L	2	4
Visual Impacts	2	# of Receptors	17	1	2	# of Receptors			0	# of Receptors			0
Air Quality	1	Distance (miles)	13	2.5	2.5	Distance (miles)	12.23	2.5	2.5	Distance (miles)	15.06	1	1
Noise	2	# of Receptors	9	2	4	# of Receptors	6	3	6	# of Receptors	18	1	2
Regulated Material	1	**Preliminary study indicates that no Regulated Material Sites will be impacted by roadway improvements**											
Cultural Resources	2	#	N/A	2.5	5	#	N/A	2.5	5	#	1	2	4
Average Weight	2.2												
Total					40.5				38				39.5
Average					4.1				3.8				4.0

Evaluation Criteria		Segment Options											
FUNDABILITY	Weight	I1				I2				H-E-F2			
		Metrics	Value	Rankings	Score	Metrics	Value	Rankings	Score	Metrics	Value	Rankings	Score
Construction Cost	4	Distance (mile)	M	2	8	Distance (mile)	L	3	12	Distance (mile)	H	1	4
Phased Improvement Opportunities	5	H/M/L	M	2	10	H/M/L	L	1	5	H/M/L	H	3	15
Connectivity to Existing ROW	4	Distance (mile)	2.4	3	12	Distance (mile)	2.97	2	8	Distance (mile)	4.18	1	4
Average Weight	4.3												
Total					30				25				23
Average					10.0				8.3				7.7

Evaluation Criteria		Segment Options											
NATURAL ENVIRO. IMPACTS	Weight	I1				I2				H-E-F2			
		Metrics	Value	Rankings	Score	Metrics	Value	Rankings	Score	Metrics	Value	Rankings	Score
Pre-NEPA Considerations*													
Surface Water/Water Quality	1	# of Crossings	7	2	2	# of Crossings	5	3	3	# of Crossings	9	1	1
Special River Designations	1	**Not Applicable - No Special River Designations in Iowa.**											
Wetlands	1	Acres	4.65	3	3	Acres	5.58	2	2	Acres	8.22	1	1
Floodplains/Hydraulics	1	# of Crossings	7	2	2	# of Crossings	5	3	3	# of Crossings	9	1	1
Threatened & Endangered Species	2	Habitat acres / H/M/L	4.29	3	6	Habitat acres / H/M/L	3.35	2	4	Habitat acres / H/M/L	5.46	1	2
Section 4(f) Property	3	Acres	N/A	2	6	Acres	N/A	2	6	Acres	N/A	2	6
Average Weight	1.5												
Total					19				18				11
Average					3.2				3				1.8

*Factors identified for Pre-NEPA consideration are resources protected by Federal Legislation. For purposes of this study, preliminary field surveys and literature searches have provided information toward the potential presence of these resources in the study corridor. Exact impacts will be addressed by future NEPA studies on standalone projects within the corridor. Efforts have been made to avoid these resources during the layout of the alignment options. However, the potential for impacts should be considered in the selection process.

FINAL COMPARISON	I1	I2	H-E-F2
Segment Total Score	**204.5**	**192**	**141.5**
Segment Average Score	**42.3**	**38.1**	**29.9**

Analysis Summary

The following is a summary of the reasons that each segment was selected to be carried forward into the east or west ultimate build corridors for further comparison.

Segment B2

- Required the smallest area of right-of-way for construction
- Utilized the longest segment of existing U.S. Highway 63
- Provided the most opportunity for phased improvement

Segment C1

- Provided the best opportunity for growth in Economic Development for New Sharon
- Provided the most opportunity for phased improvement
- Utilized the longest segment of existing U.S. Highway 63
- Created the least diagonal severance
- Impacted the fewest water crossings
- Required the smallest area of right-of-way for construction

Segment D1

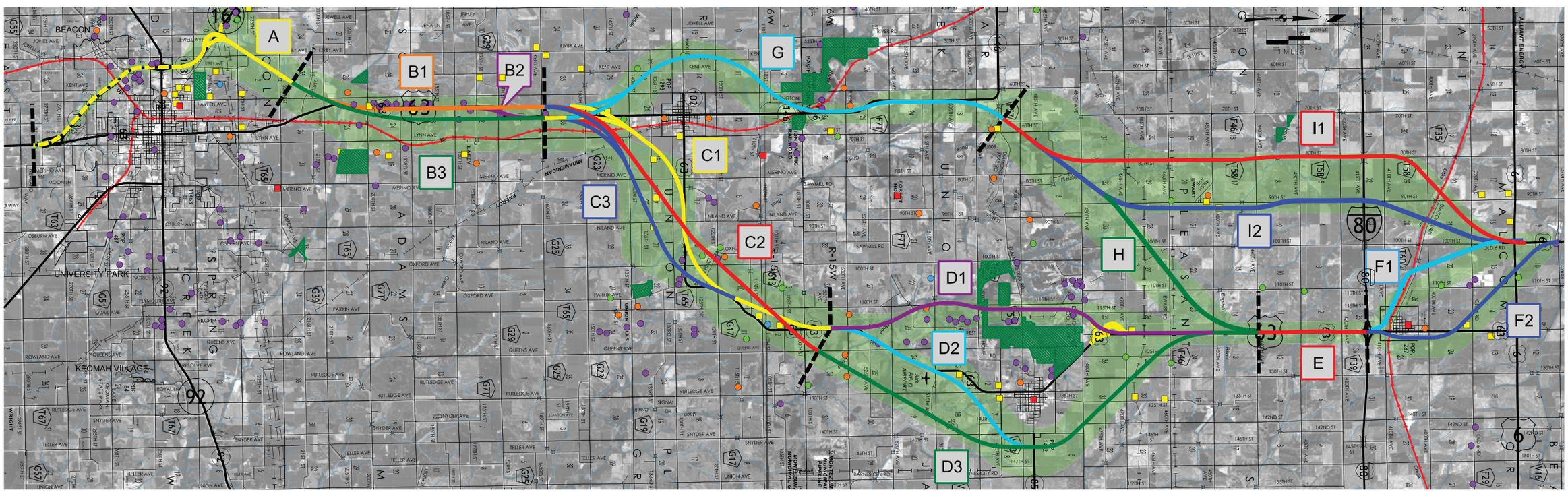
- Created the least amount of out-of-distance travel, resulting in the lowest annual user cost for out-of-distance travel
- Provided the best regional connectivity
- Created the least diagonal severance
- Impacted the smallest area of agricultural land

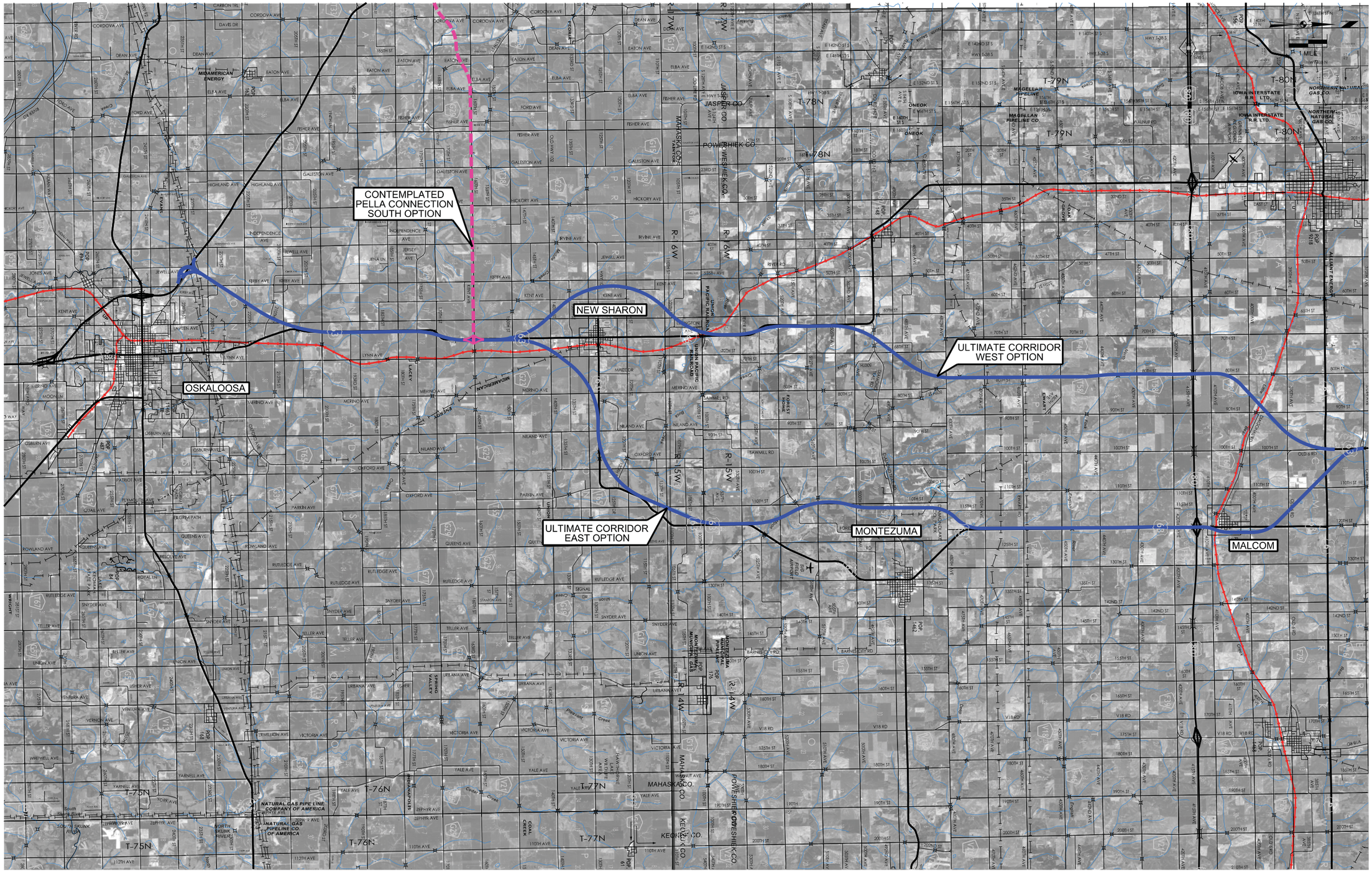
Segment I1

- Required the least impact to the local road network
- Provided the best regional connectivity
- Required the smallest area of right-of-way for construction
- Created the least diagonal severance
- Impacted the smallest area of agricultural land
- Introduced the fewest conflicts points and was predicted the safest of the three options

Results in this map of two "Ultimate Corridors".

Sheets following illustrate these in more detail for comparison.

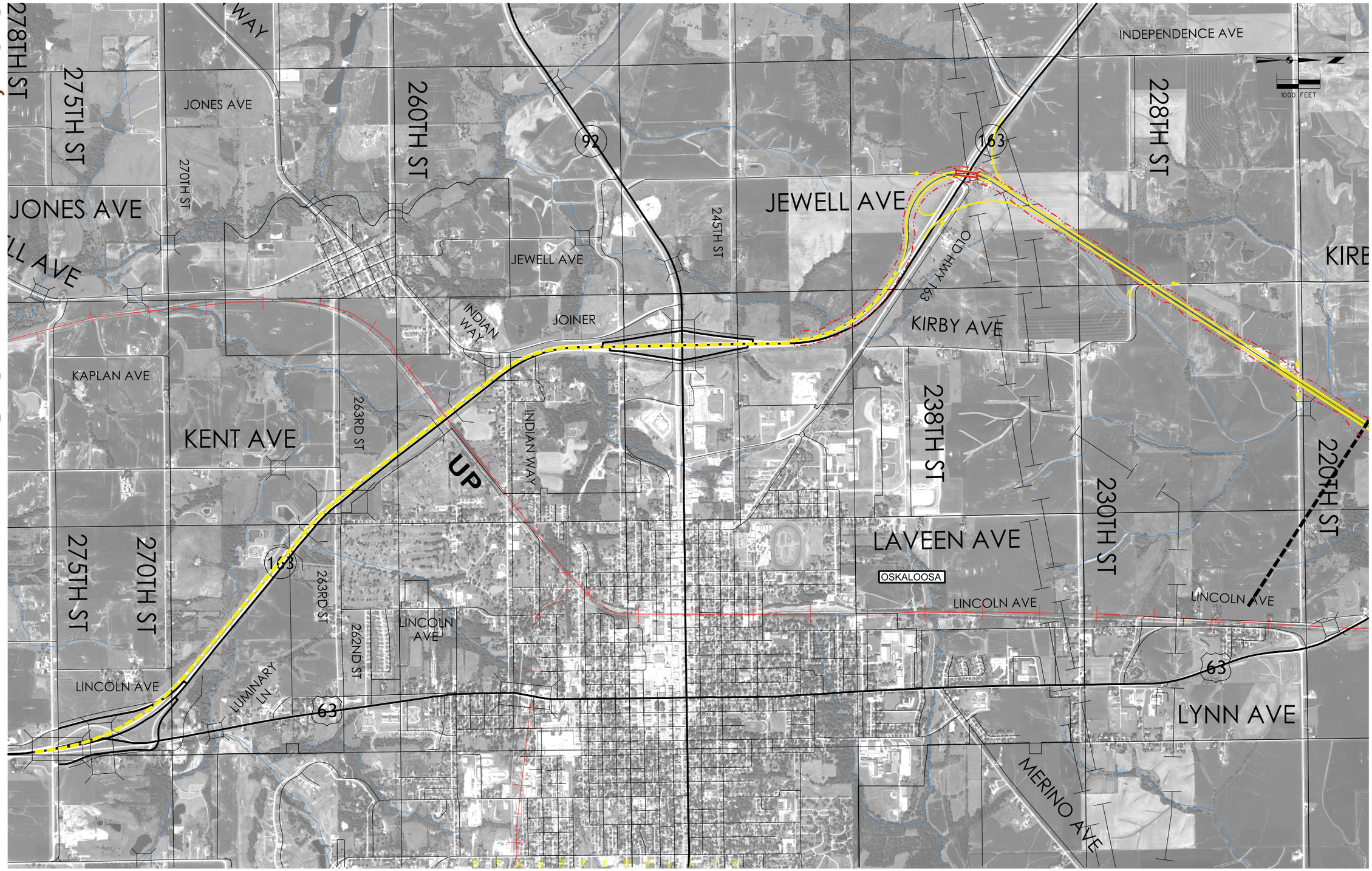


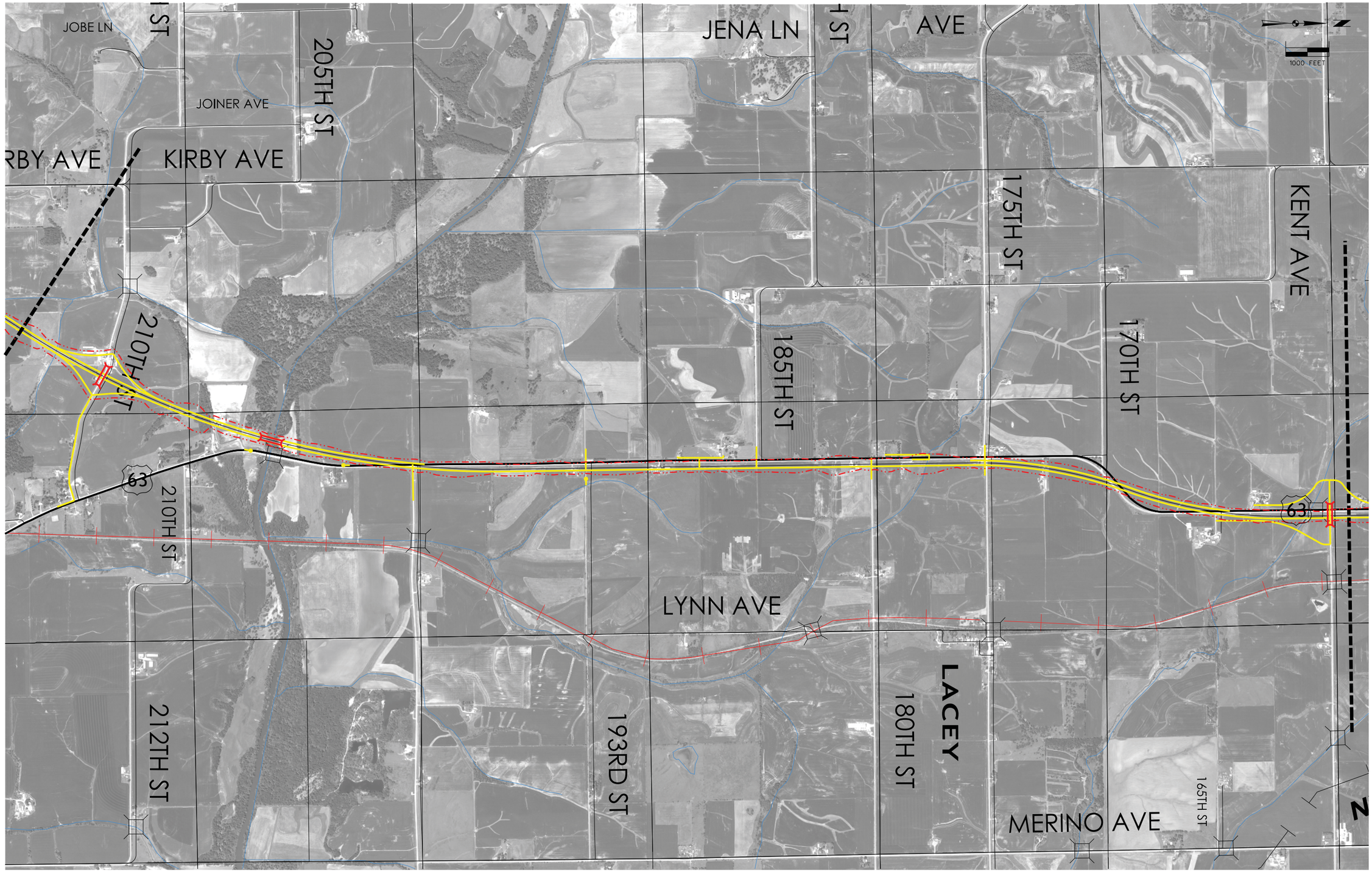


U.S. HIGHWAY 63 ULTIMATE CORRIDOR OPTIONS

SECTION 5
ALTERNATIVES EVALUATION

SEGMENT A - MAY 21, 2013





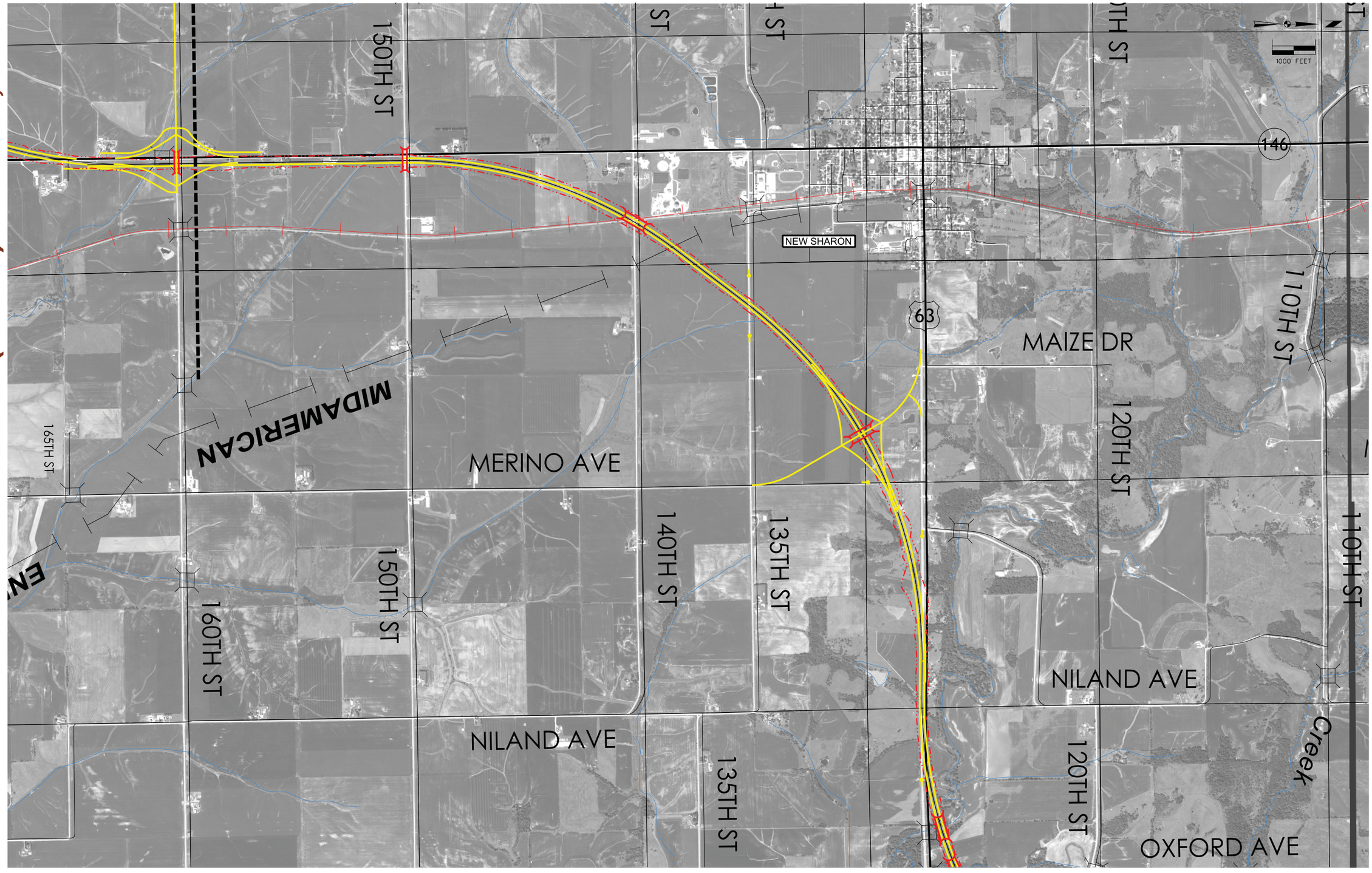
SEGMENT B- MAY 21, 2013

SECTION 5
ALTERNATIVES EVALUATION

U.S. HIGHWAY 63
CORRIDOR LOCATION STUDY

SNYDER & ASSOCIATES, INC.

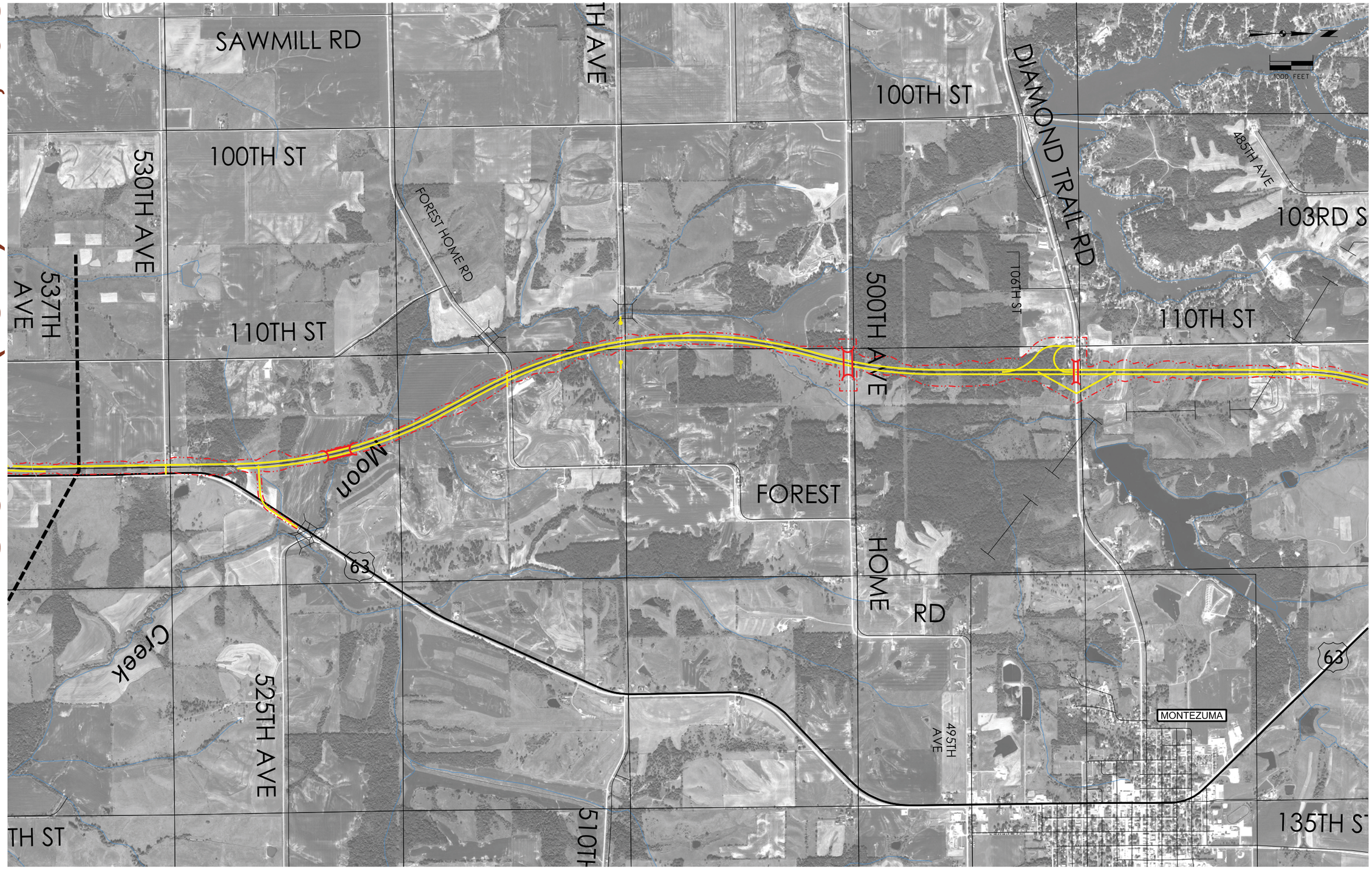
SEGMENT C (1 OF 2) - MAY 21, 2013

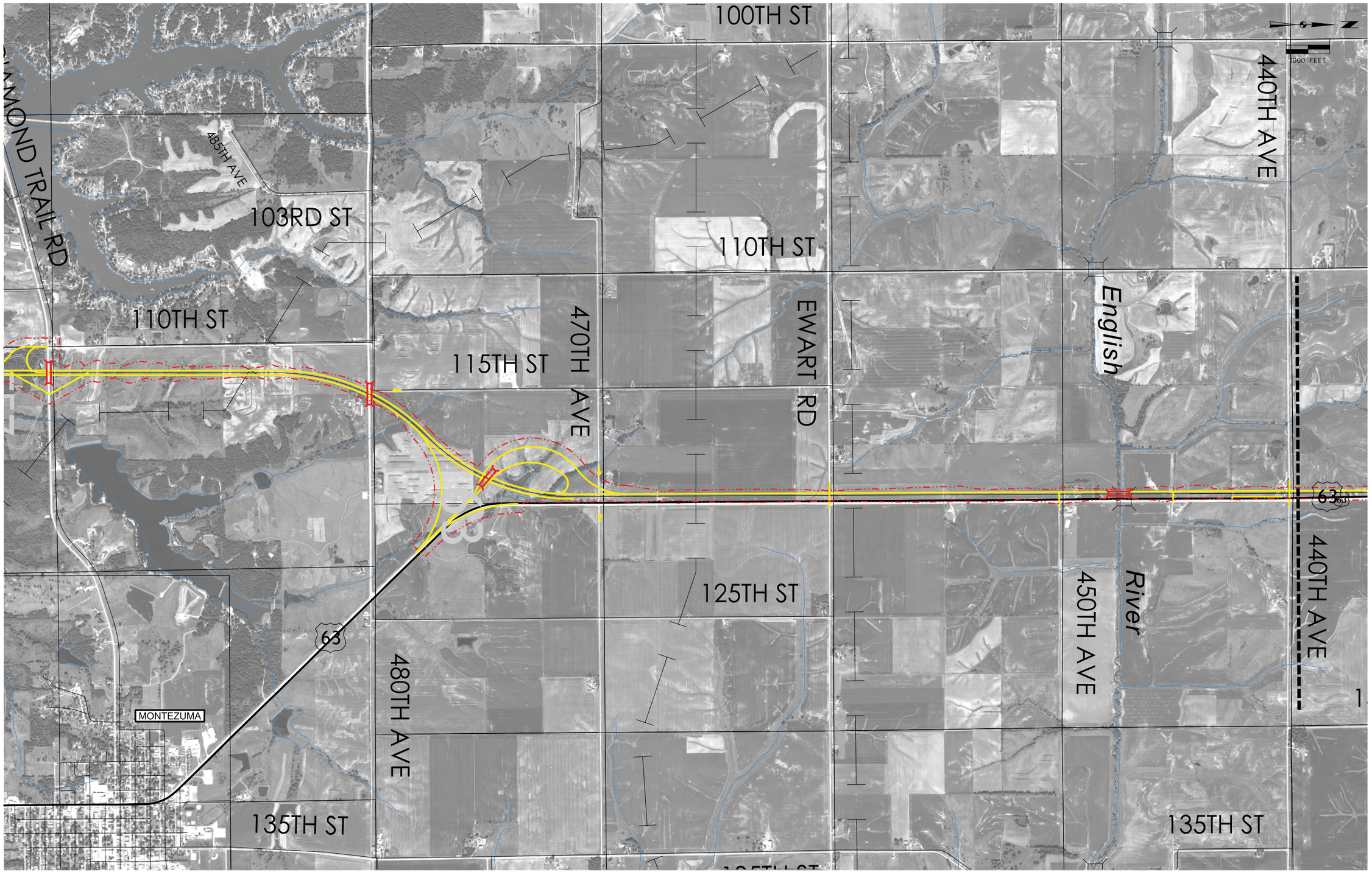


SEGMENT C (2 OF 2)- MAY 21, 2013

SECTION 5
ALTERNATIVES EVALUATION

SEGMENT D (1 OF 2) - MAY 21, 2013





SEGMENT D (2 OF 2)- MAY 21, 2013

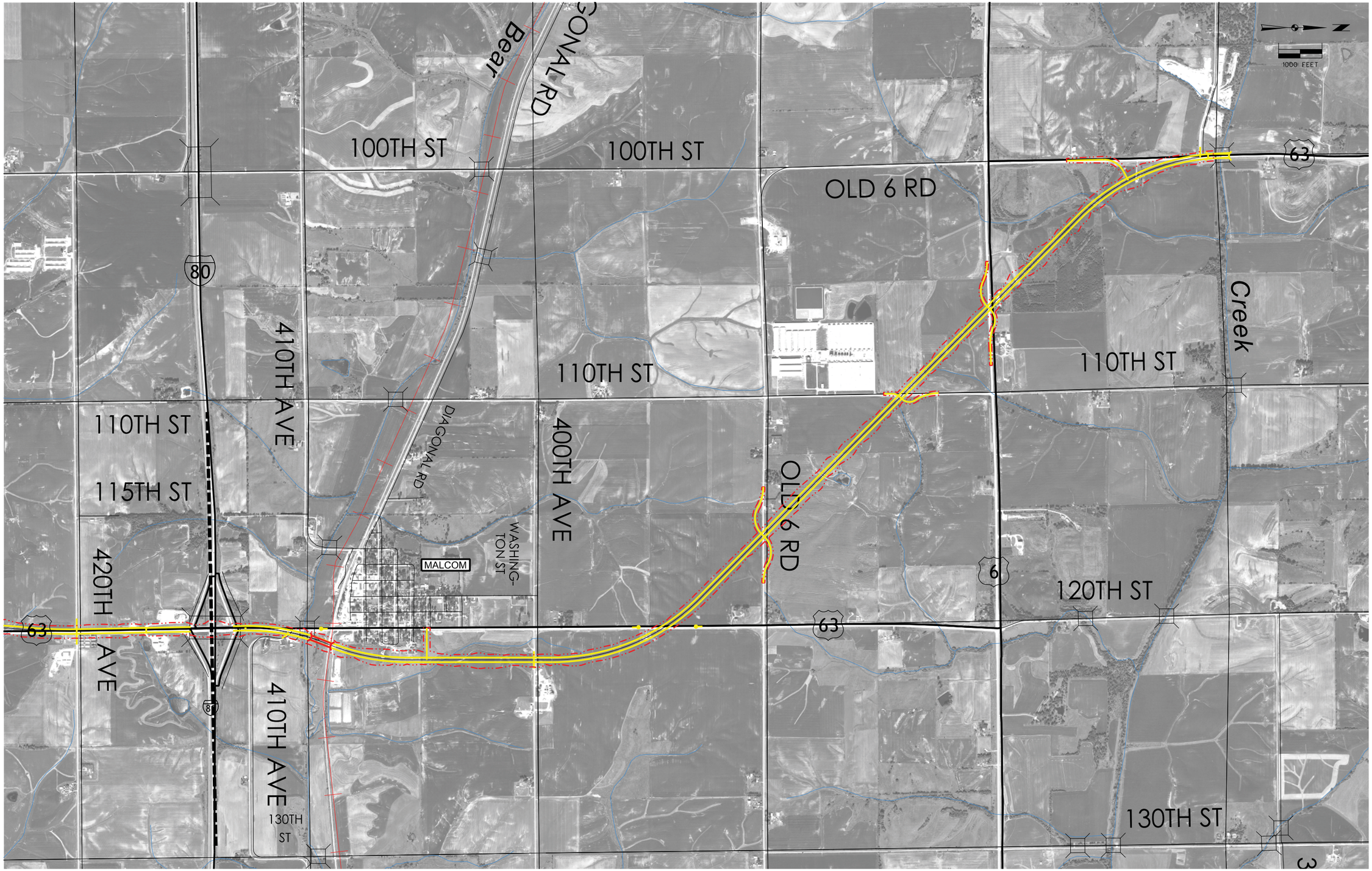
SECTION 5
ALTERNATIVES EVALUATION

SEGMENT E - MAY 21, 2013

ALTERNATIVES EVALUATION
SECTION 5

U.S. HIGHWAY 63
CORRIDOR LOCATION STUDY

SNYDER & ASSOCIATES, INC.

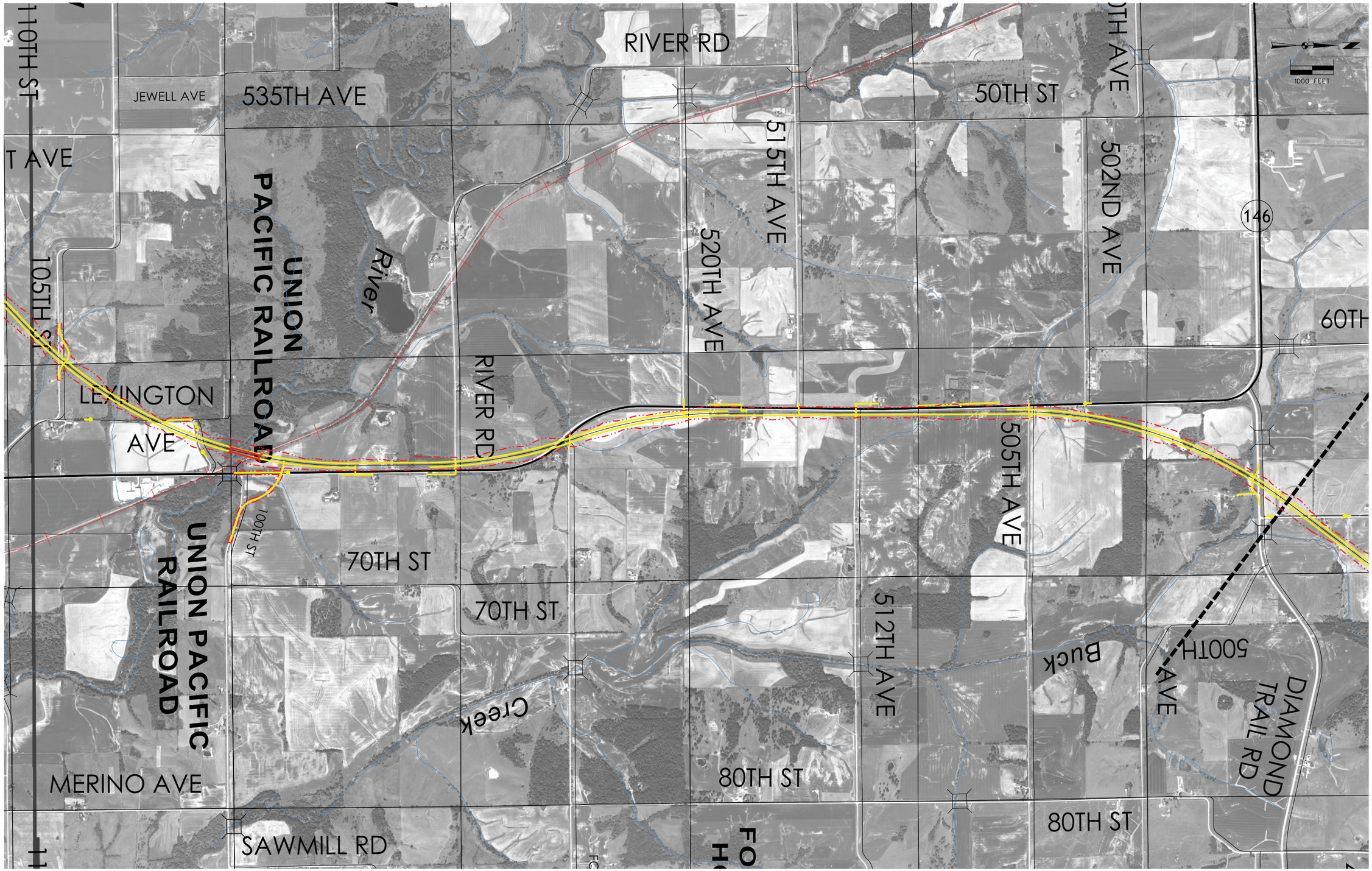


SEGMENT F - MAY 21, 2013

SECTION 5
ALTERNATIVES EVALUATION

U.S. HIGHWAY 63
CORRIDOR LOCATION STUDY

SEGMENT G (1 OF 2) - MAY 21, 2013



SEGMENT G (2 OF 2) - MAY 21, 2013

SECTION 5
ALTERNATIVES EVALUATION

Snyder & Associates, Inc.

SEGMENT I (1 OF 2) - MAY 21, 2013

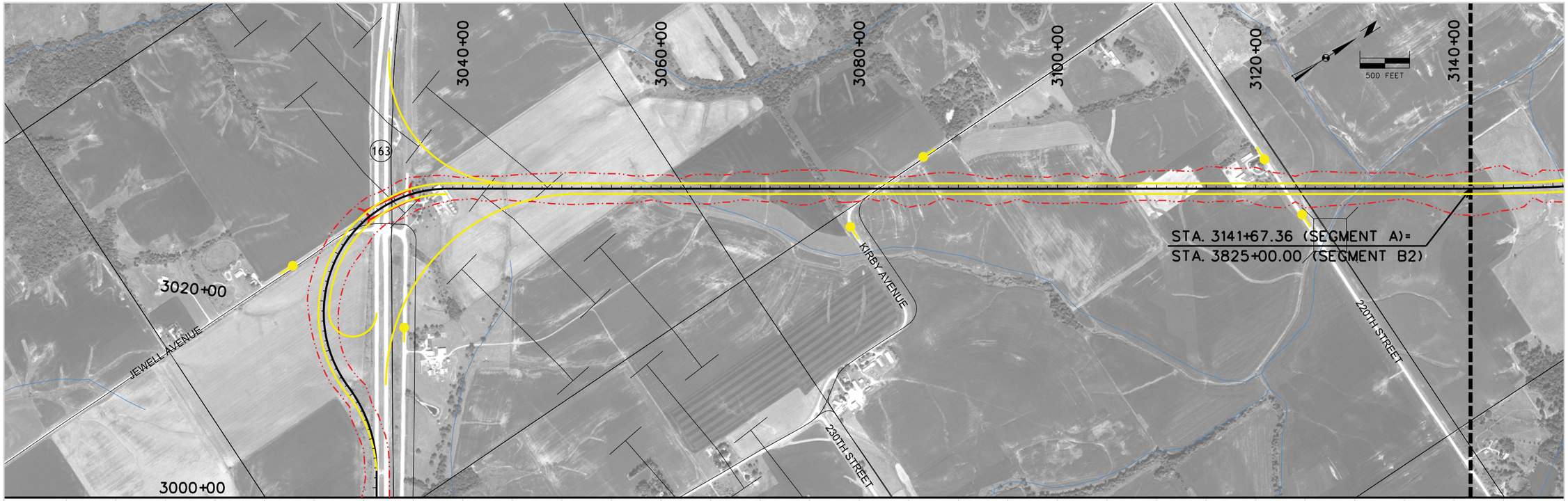
SEGMENT I (2 OF 2)- MAY 21, 2013

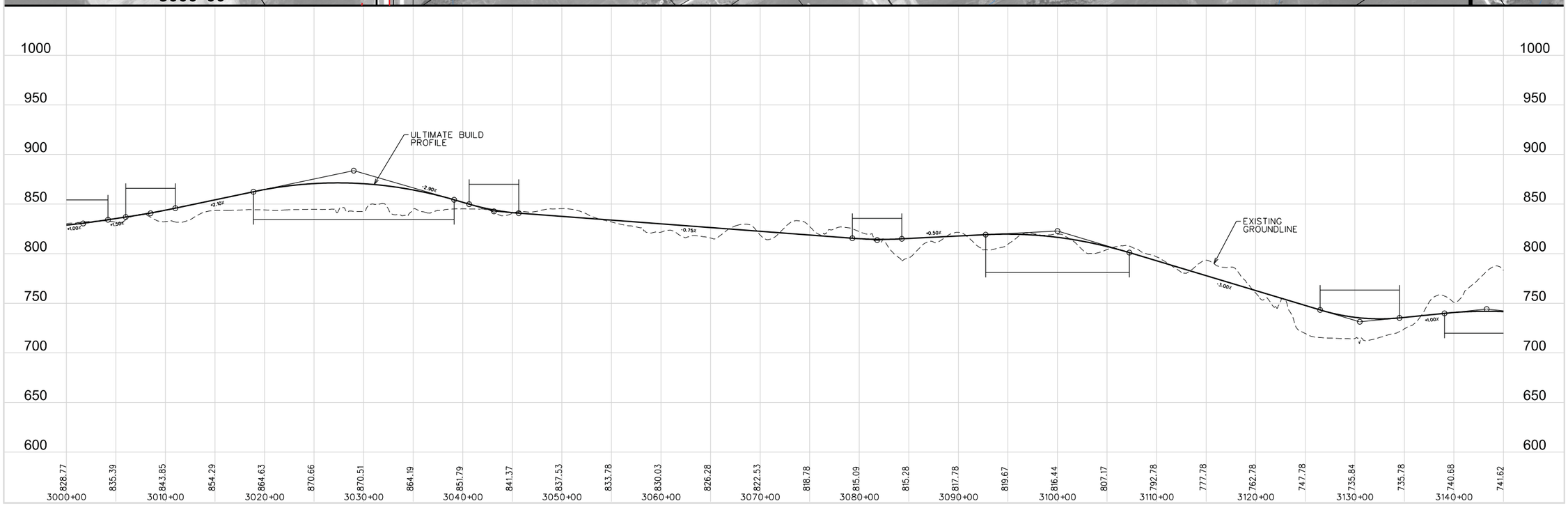
SECTION 5
ALTERNATIVES EVALUATION

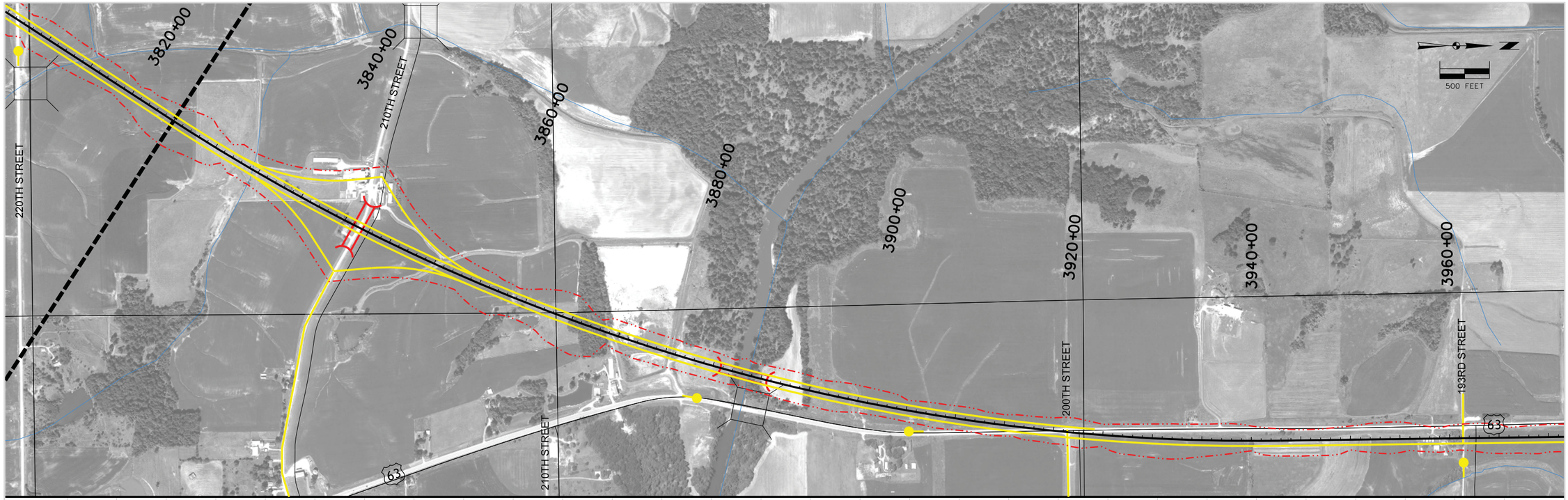
U.S. HIGHWAY 63
CORRIDOR LOCATION STUDY

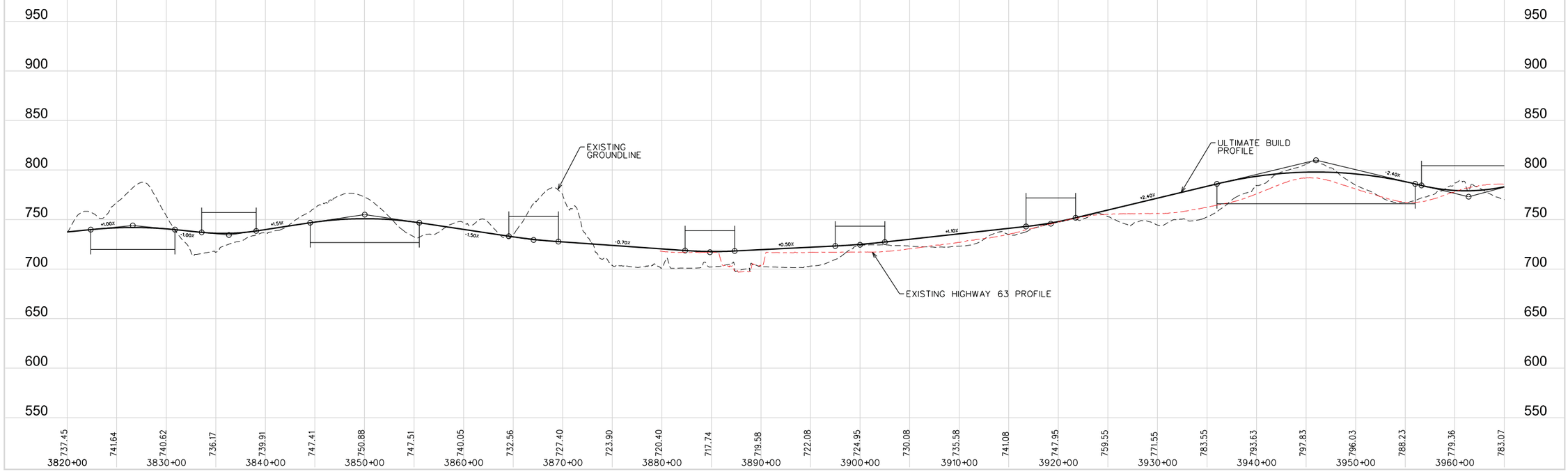
SNYDER & ASSOCIATES, INC.

ULTIMATE BUILD PROFILE ESTIMATE



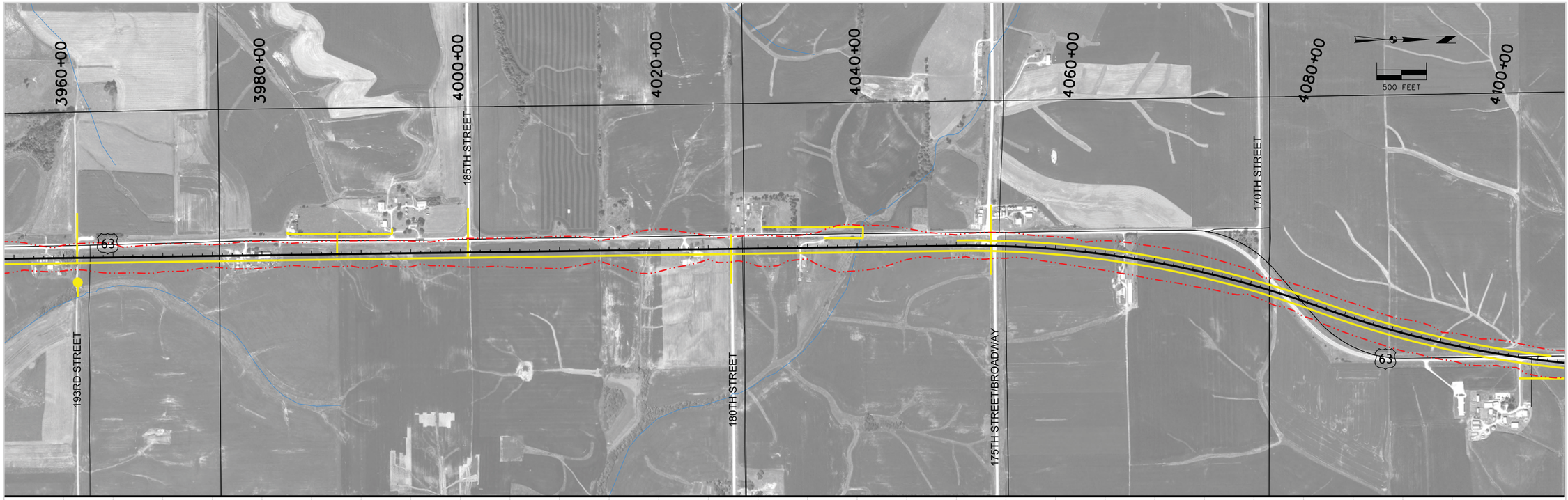


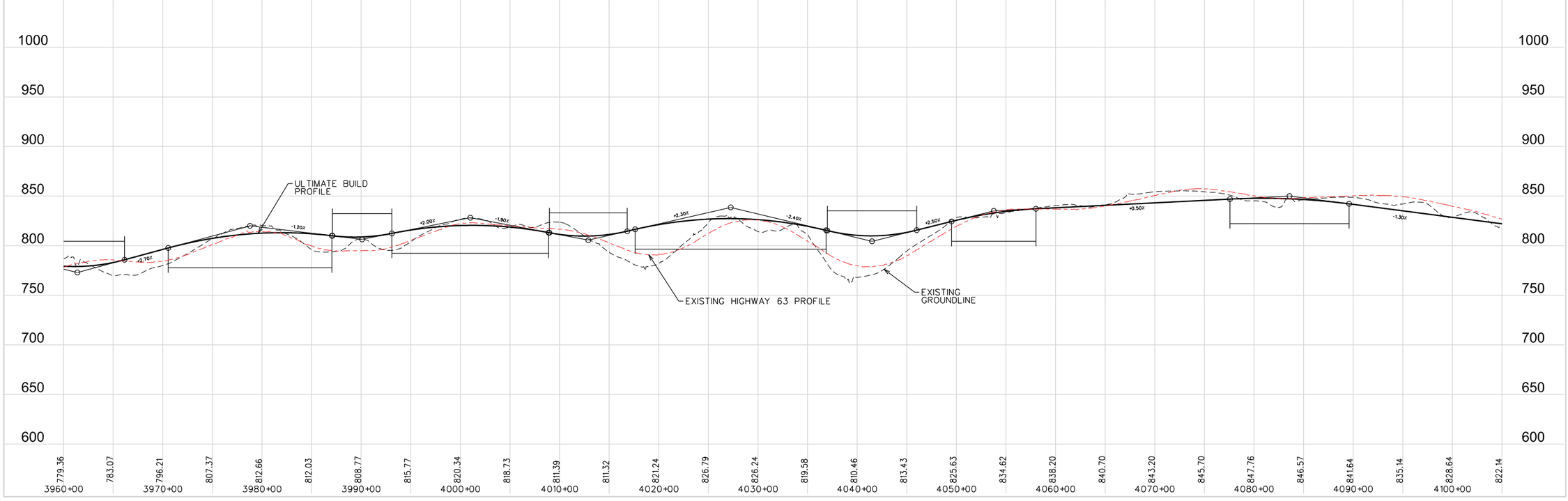


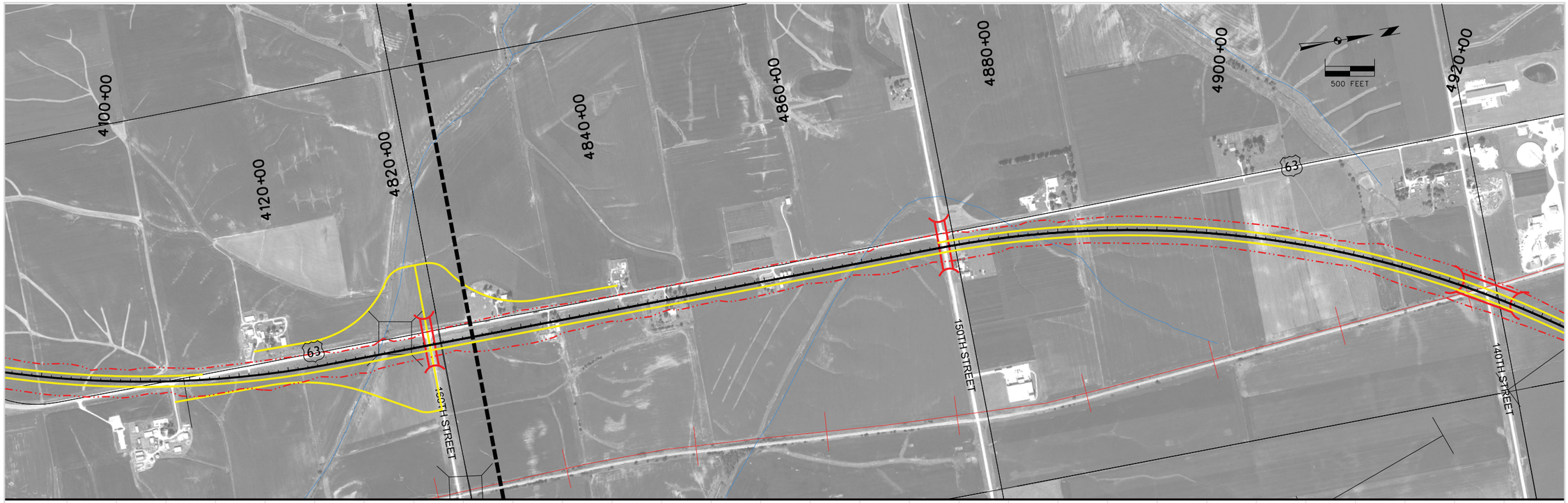


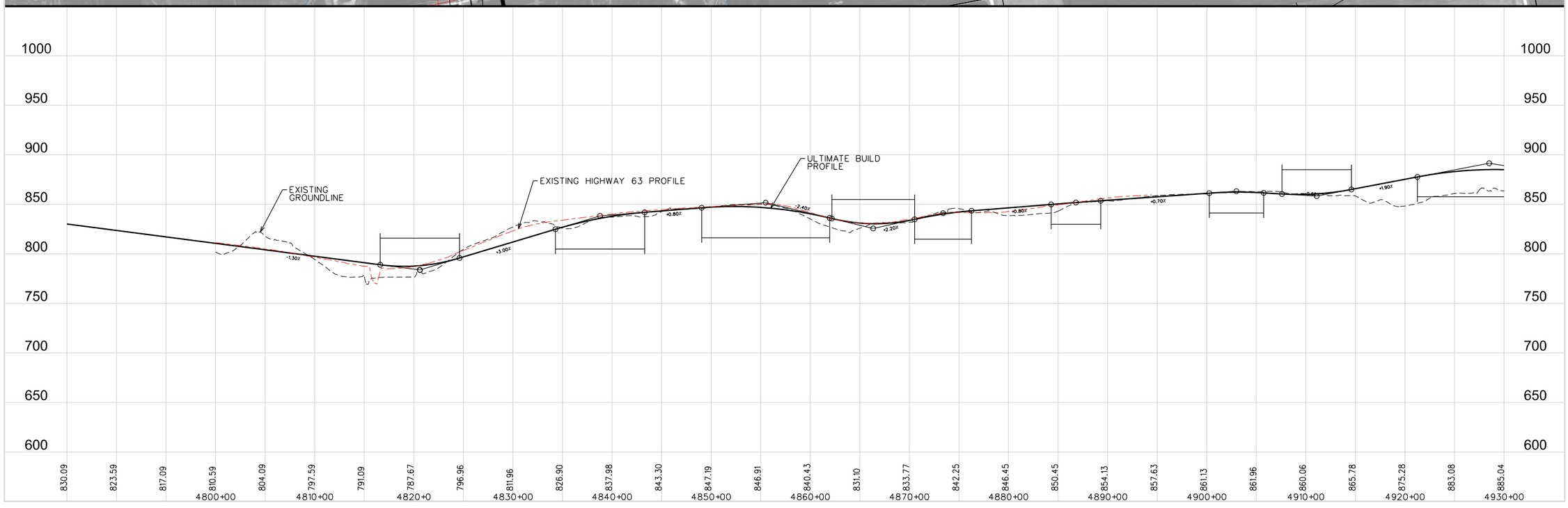
ULTIMATE BUILD PROFILE ESTIMATE

ULTIMATE BUILD PROFILE ESTIMATE









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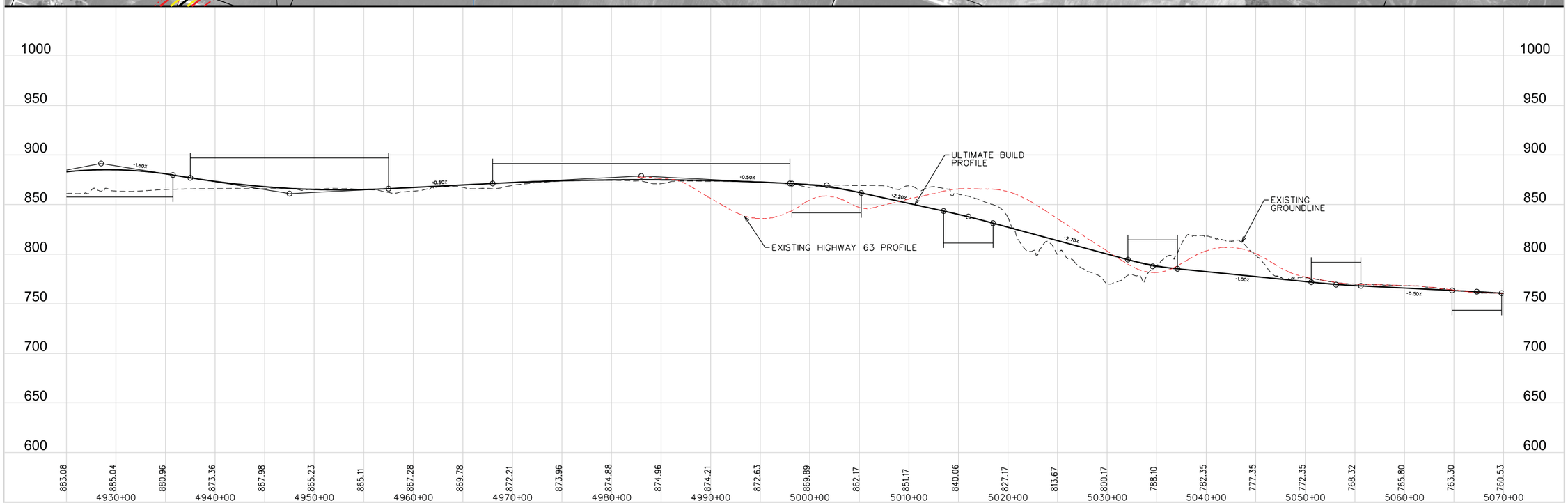
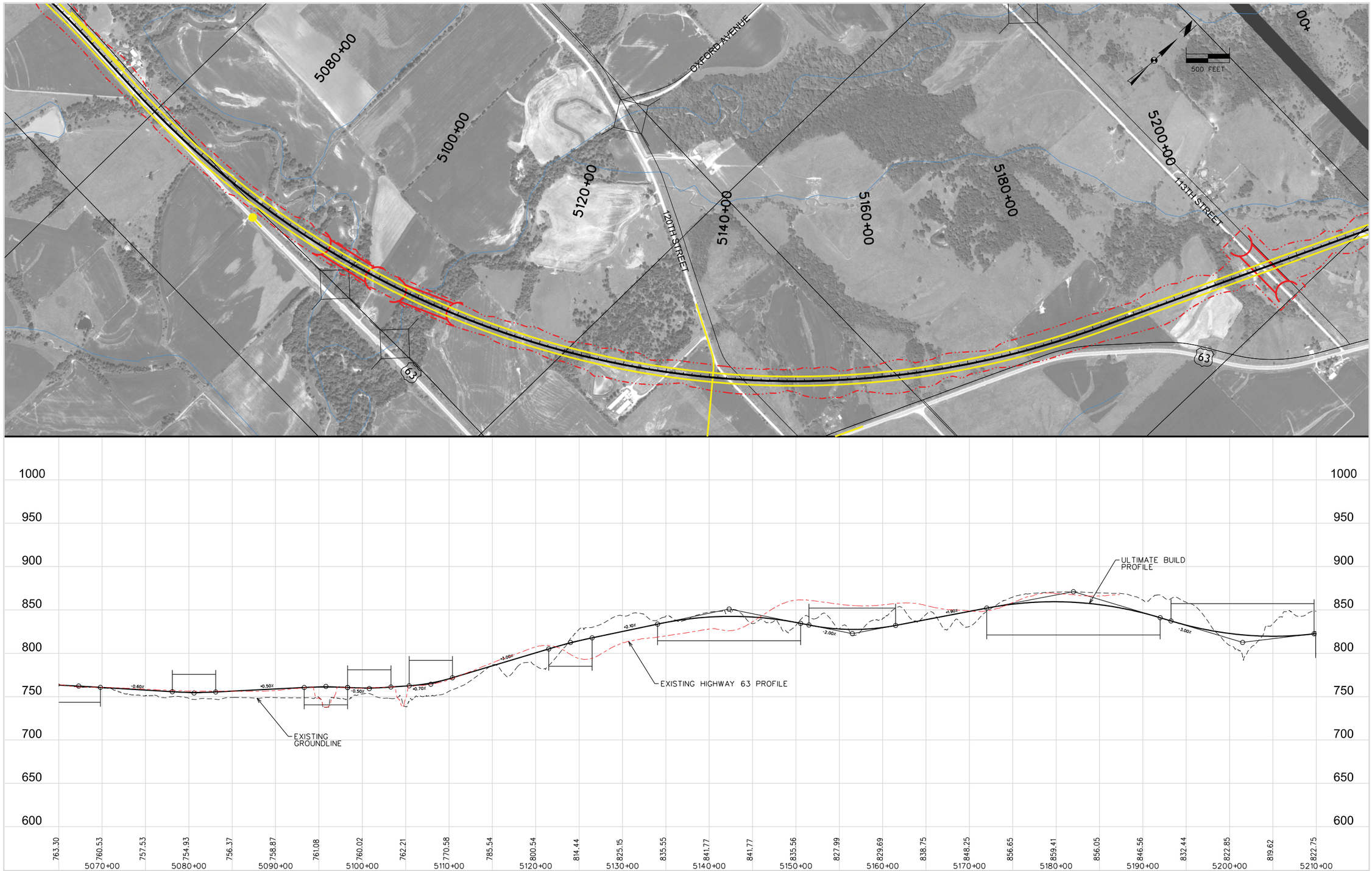
ULTIMATE BUILD PROFILE ESTIMATE (EAST OPTION)





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ALTERNATIVES EVALUATION
SECTION 5

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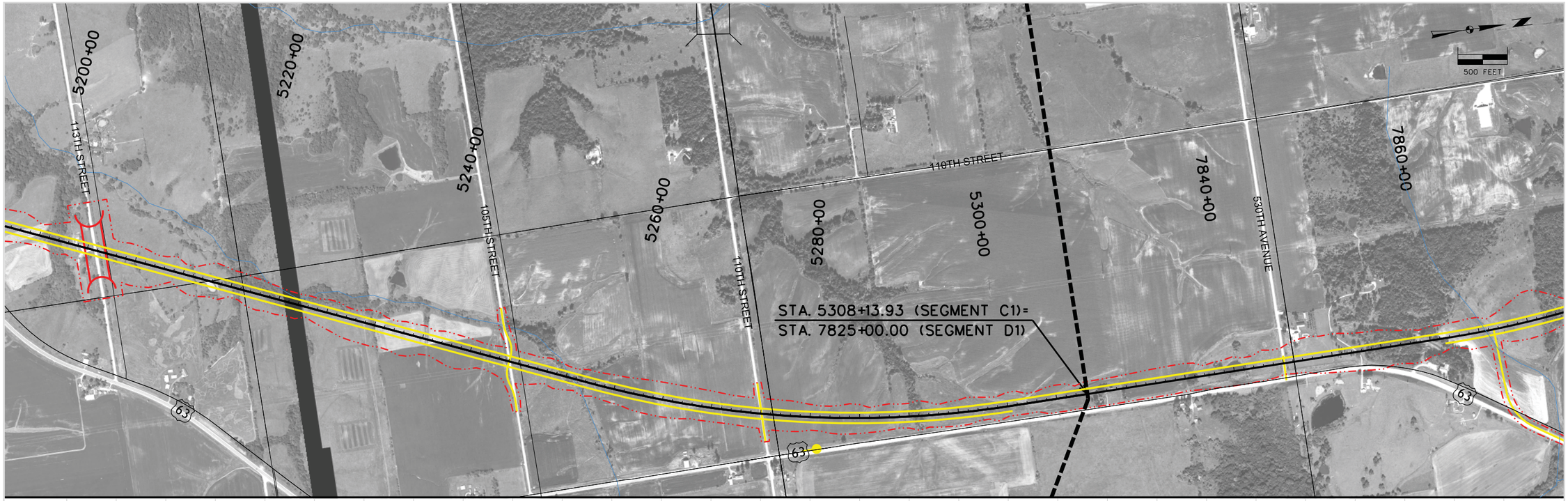
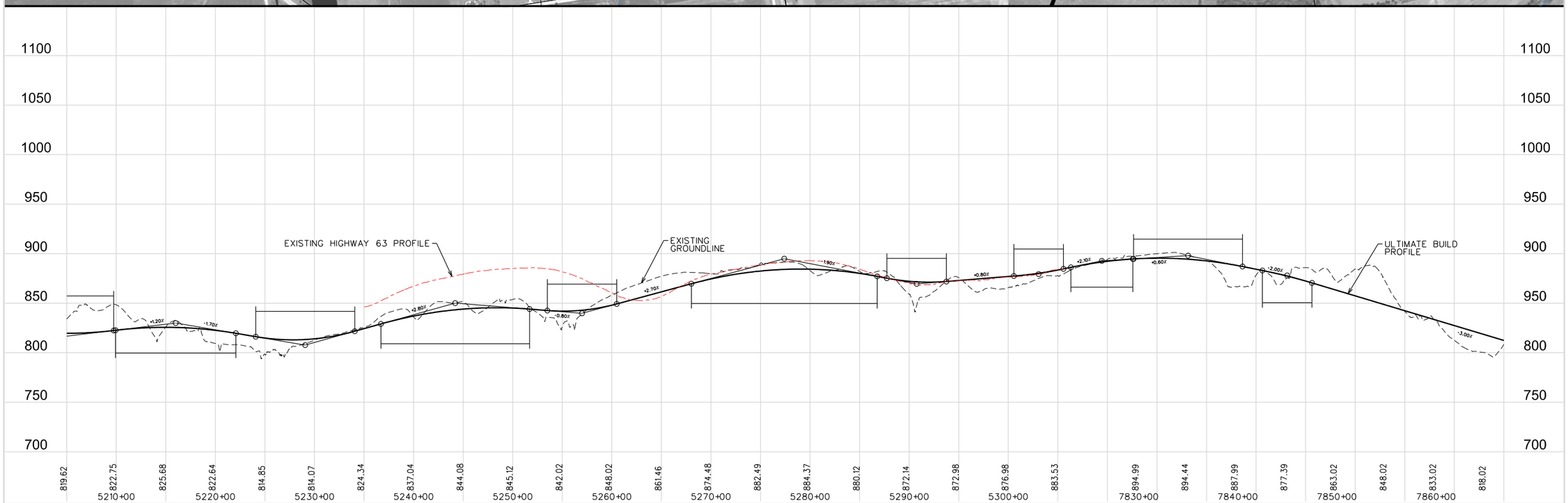
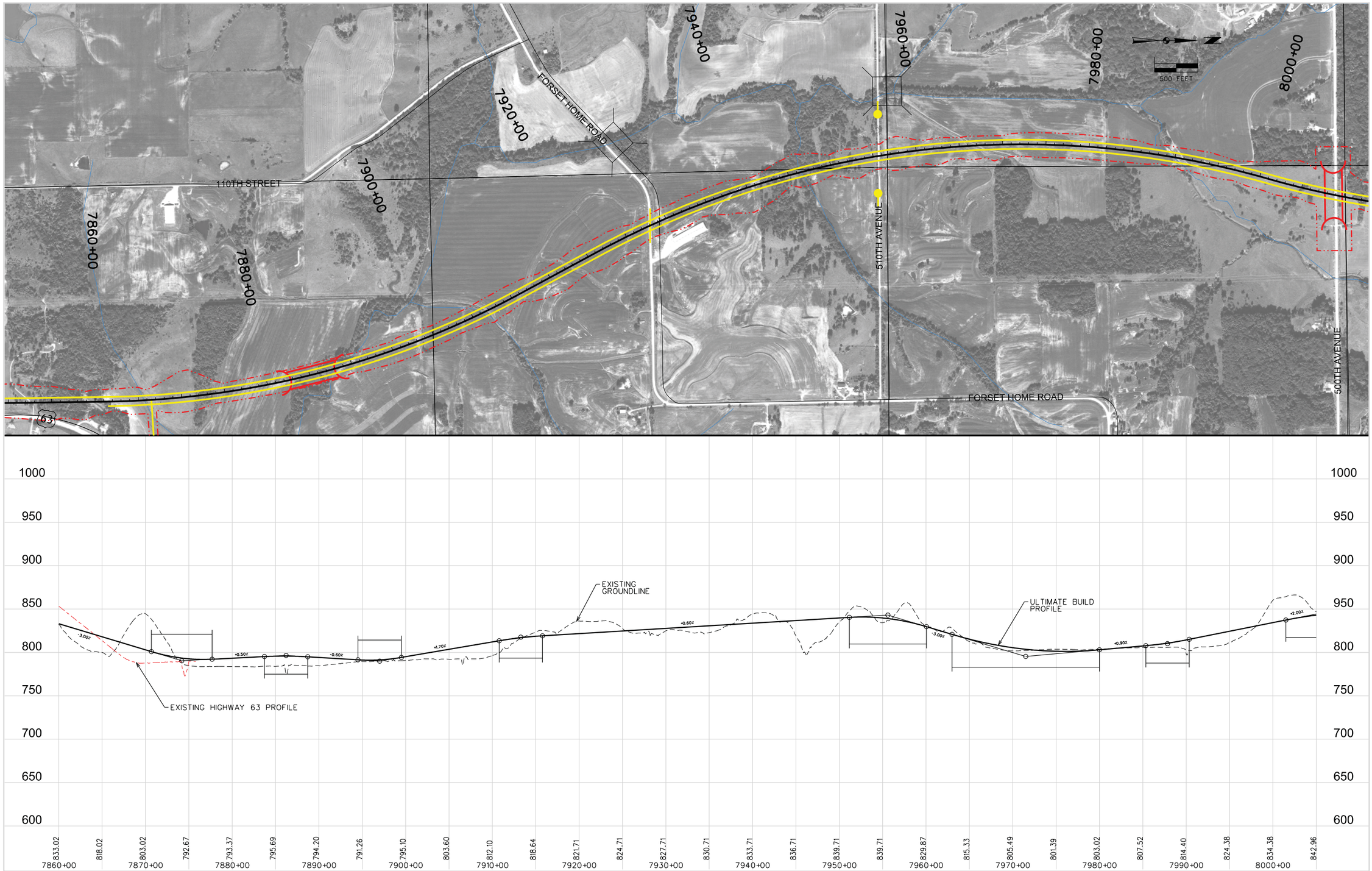




U.S. HIGHWAY 63
CORRIDOR LOCATION STUDY

SNYDER & ASSOCIATES, INC.



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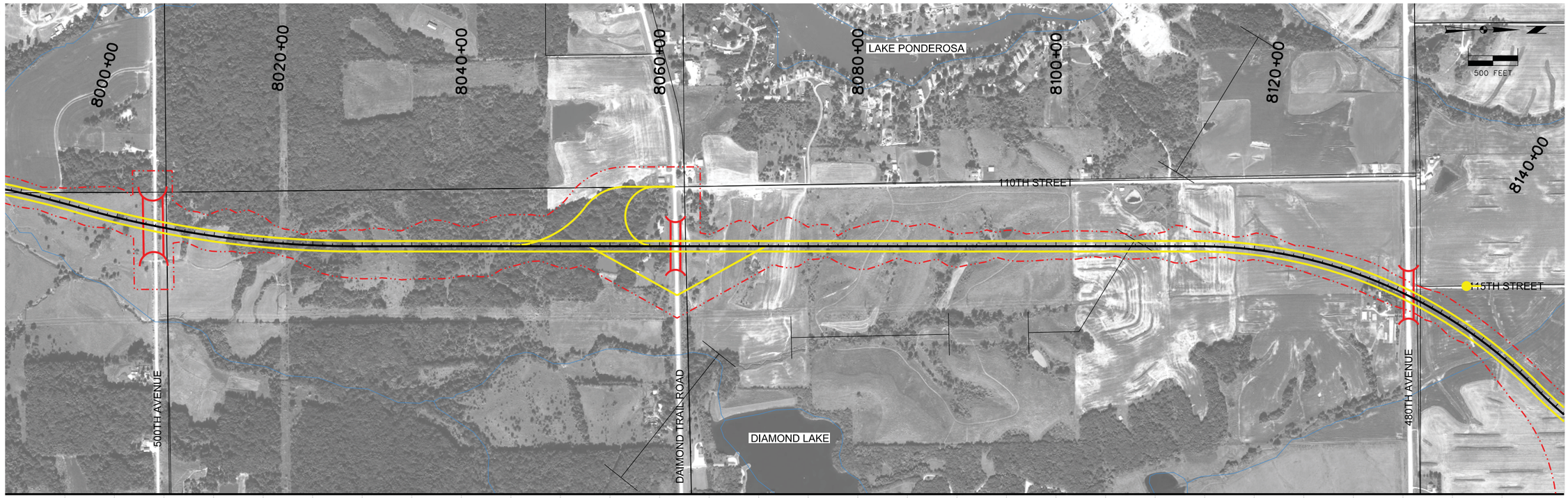

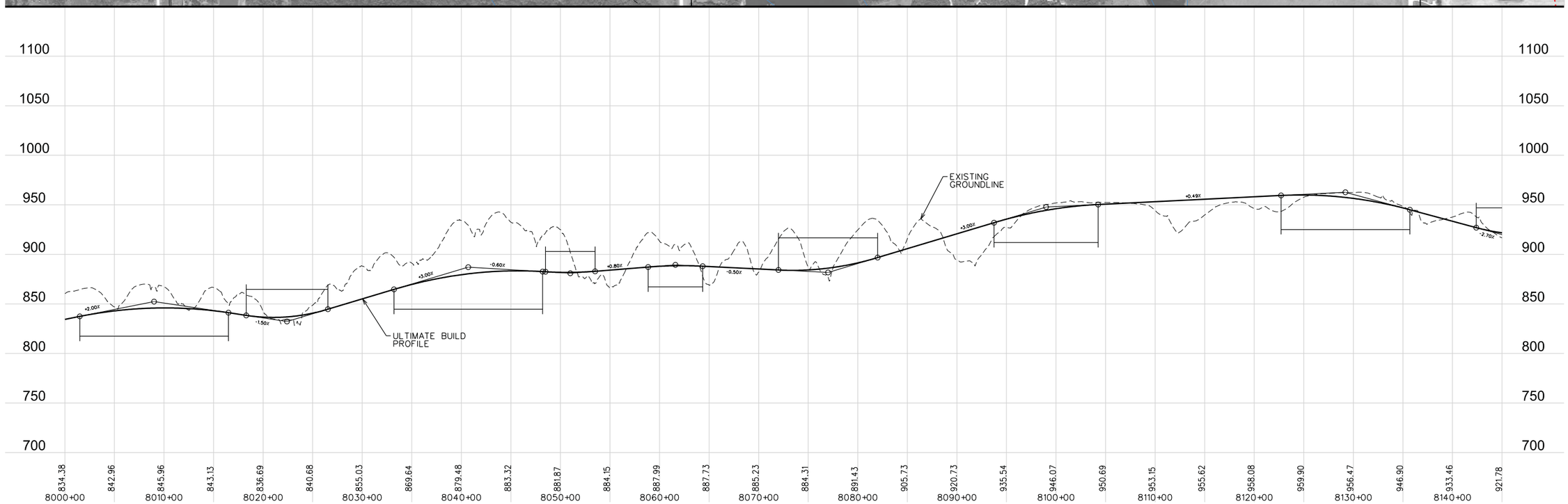

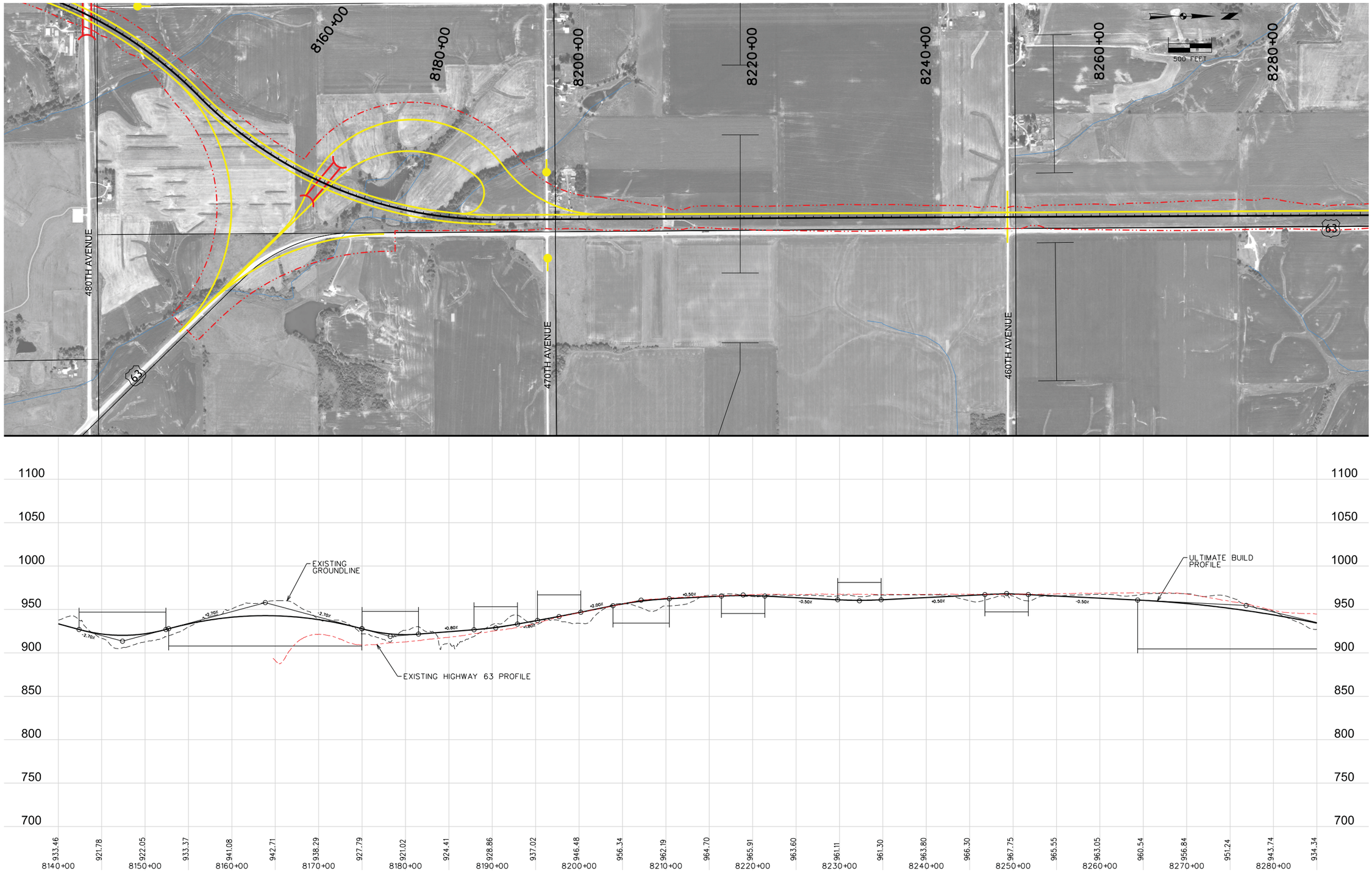

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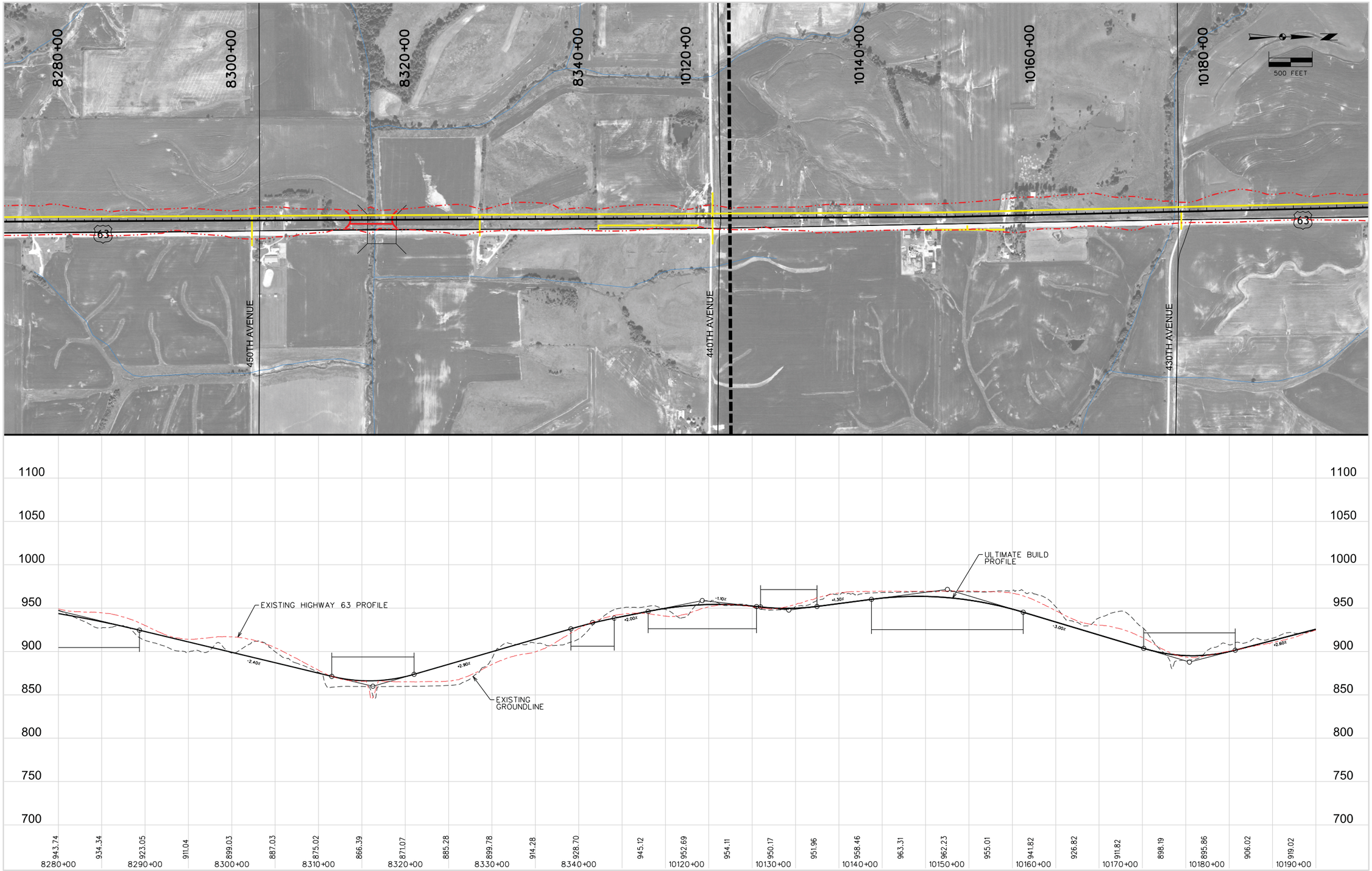

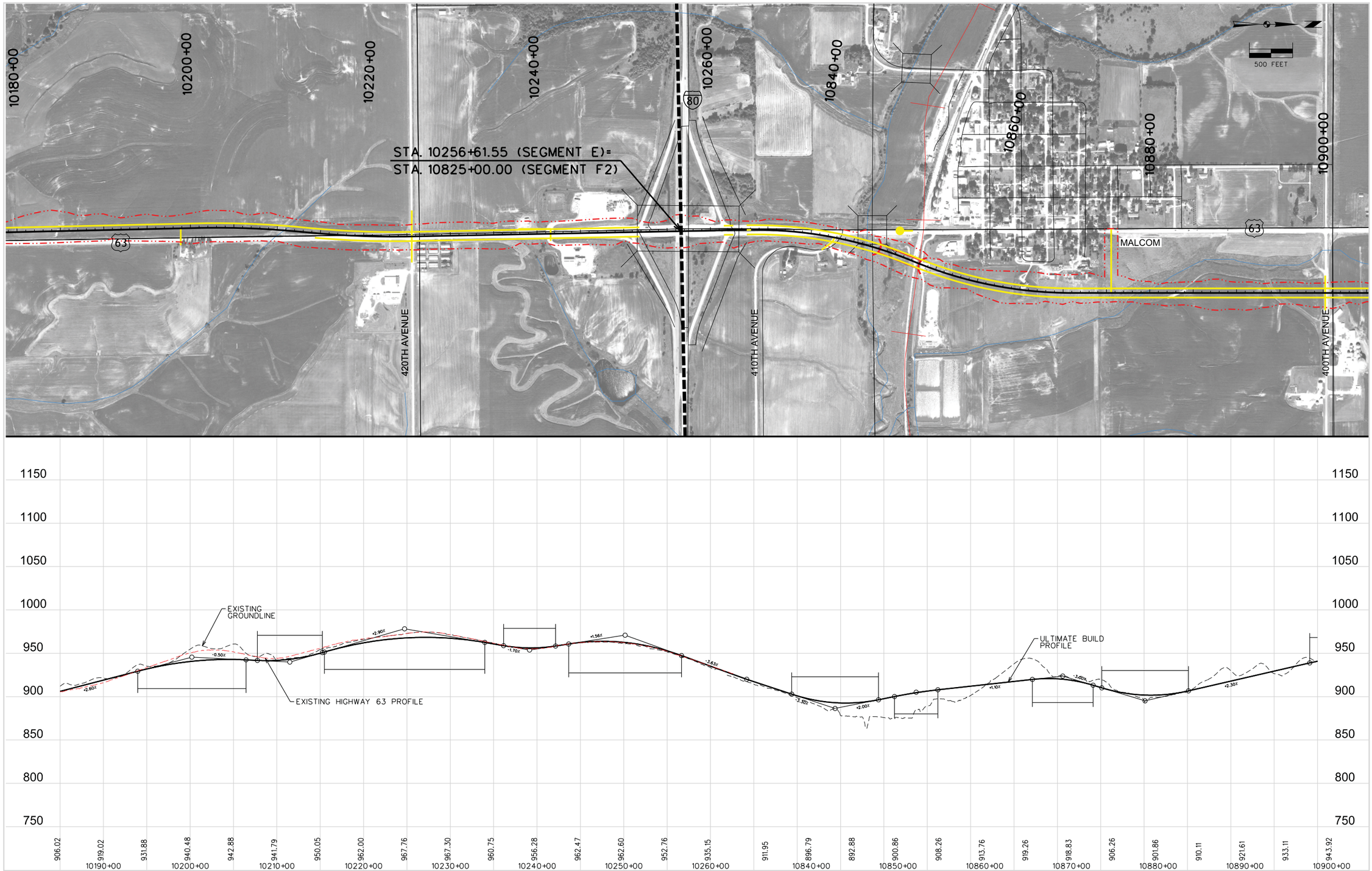

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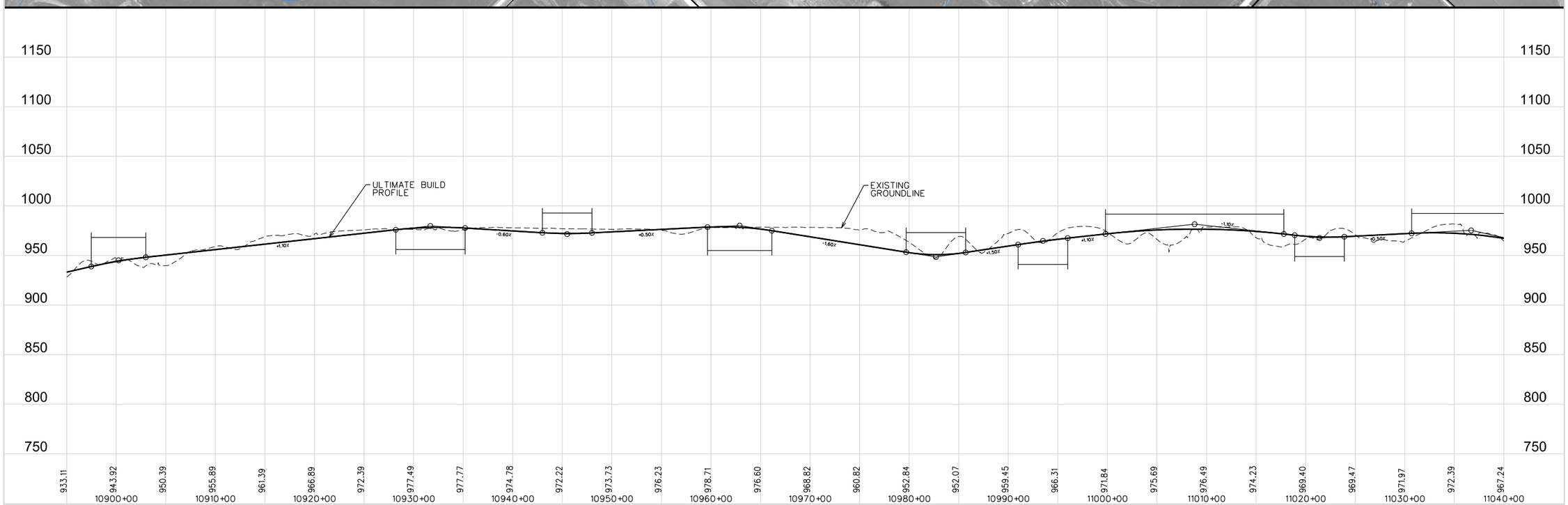

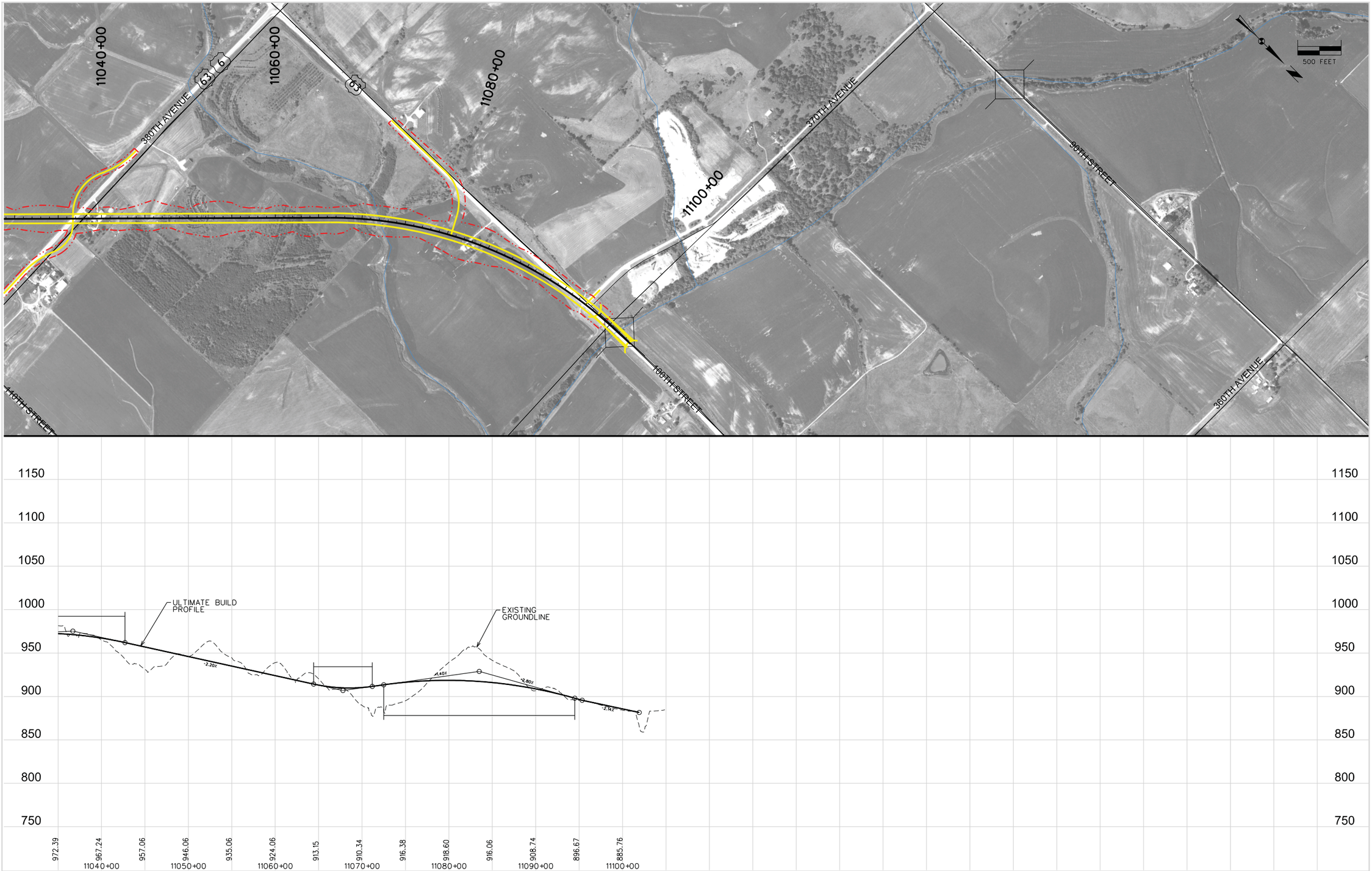

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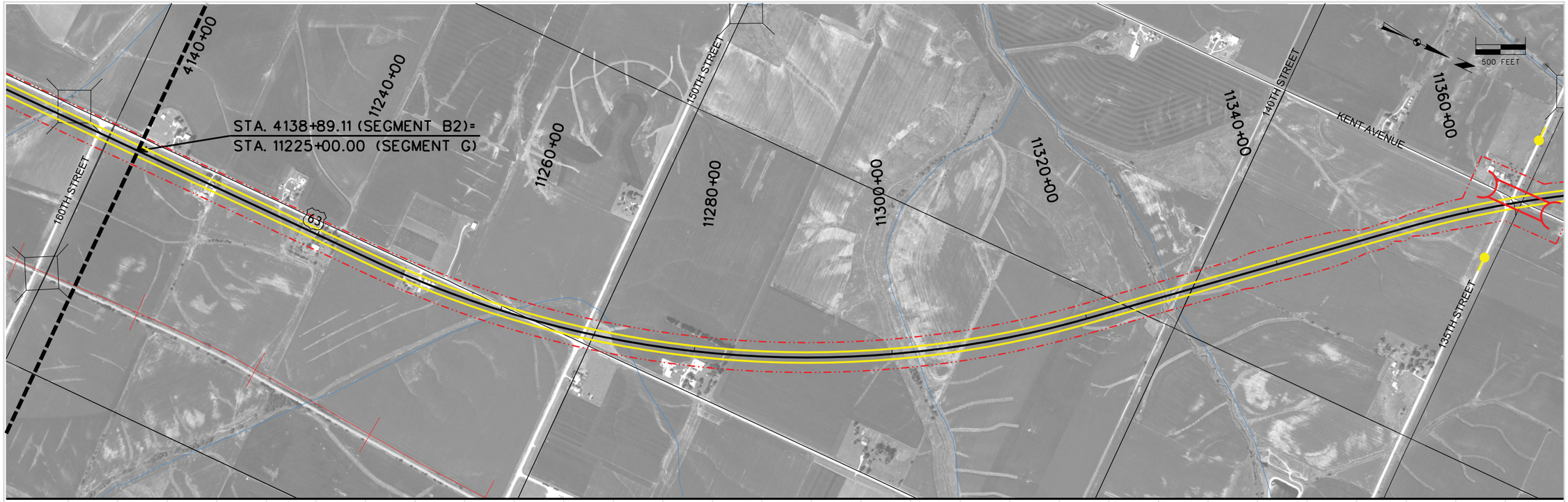

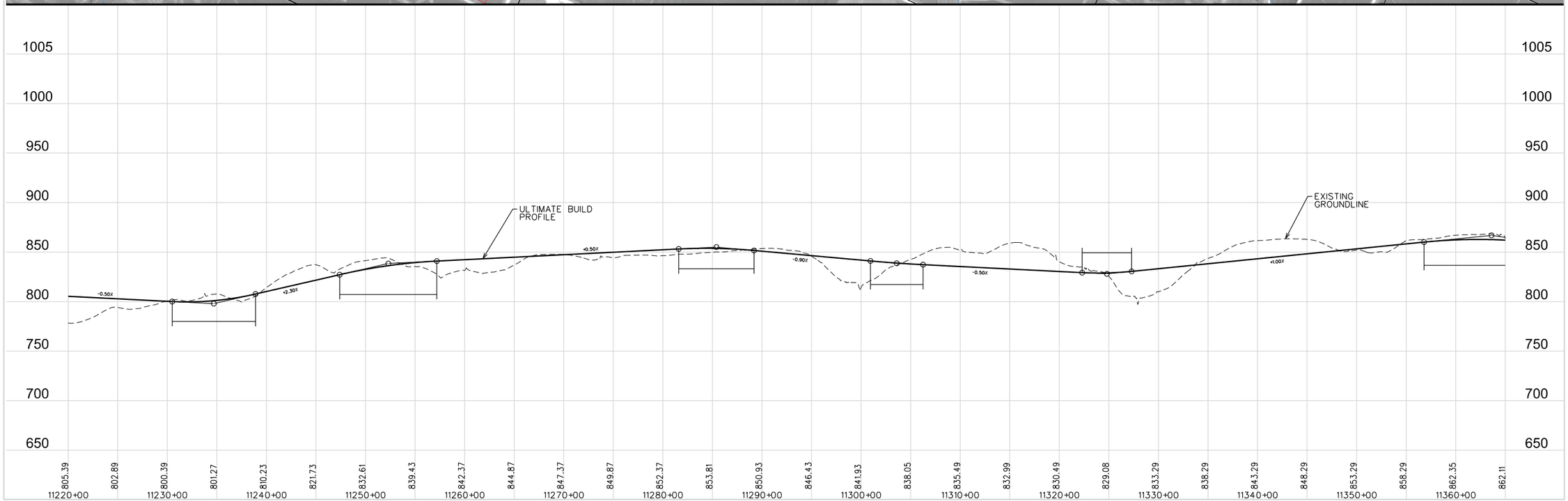

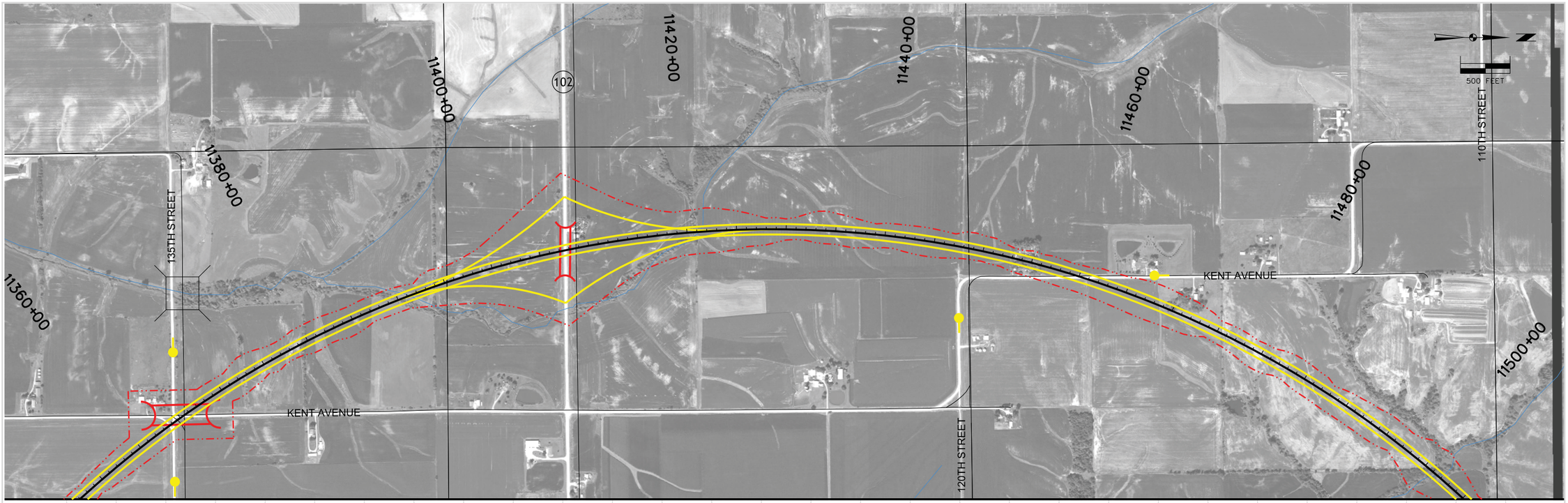

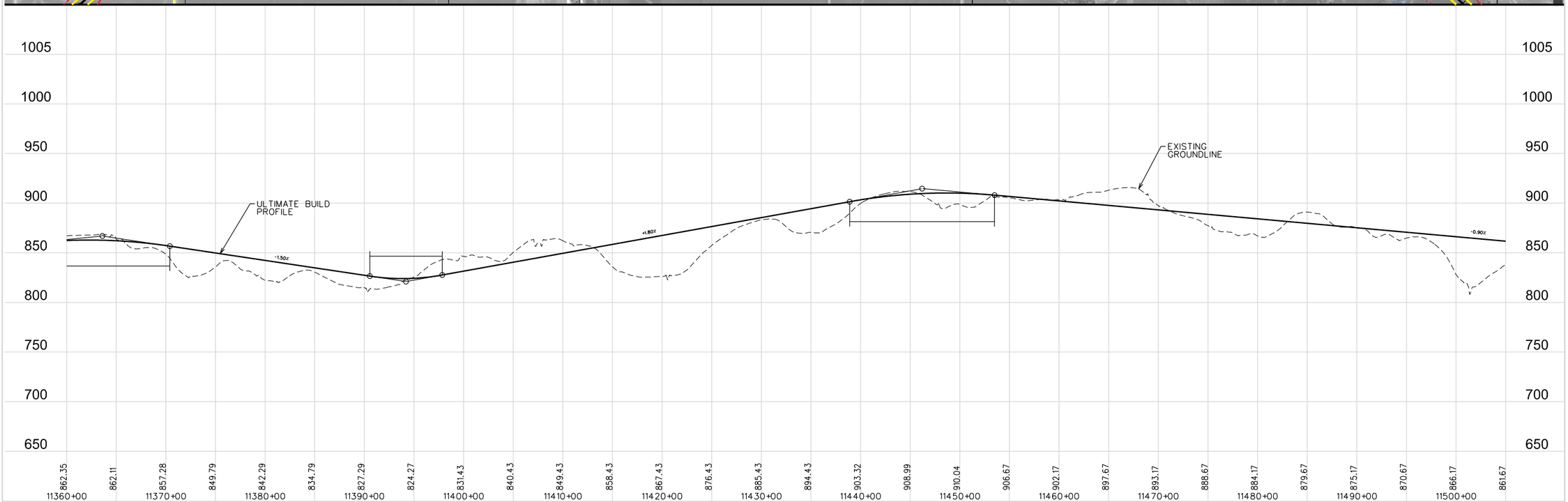

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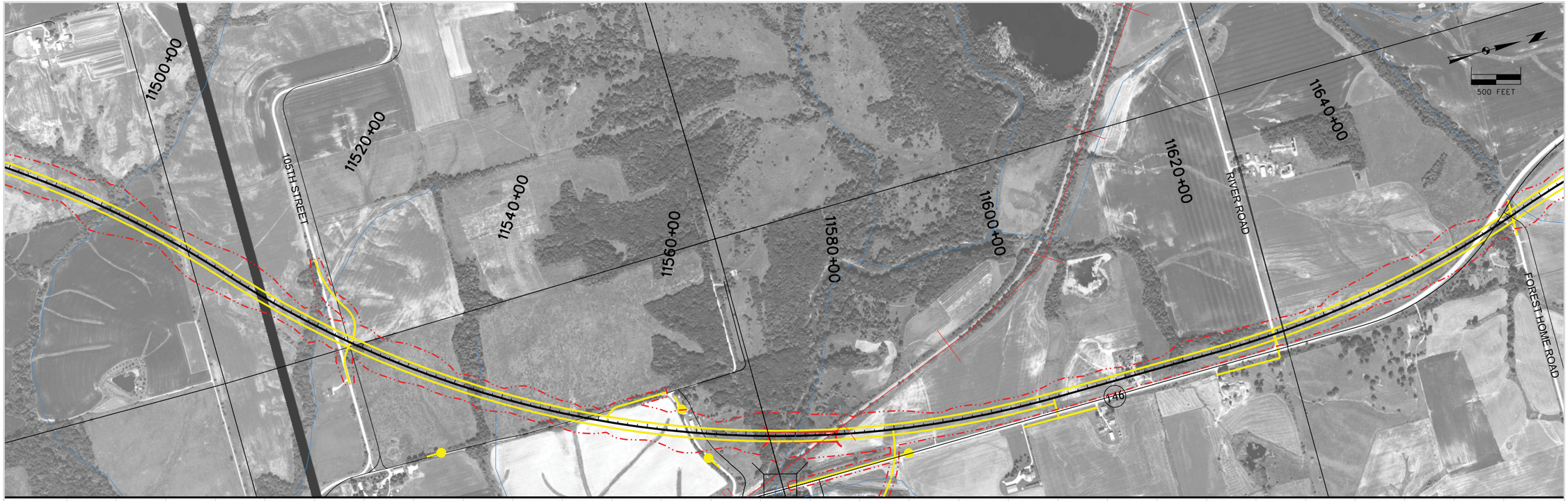

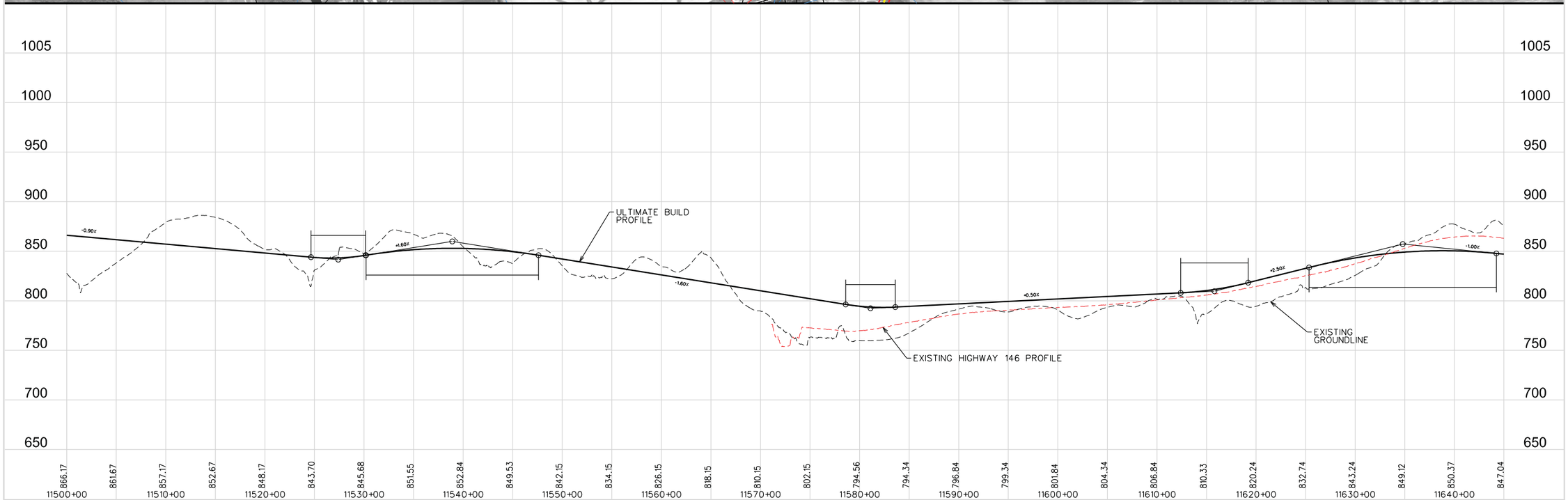

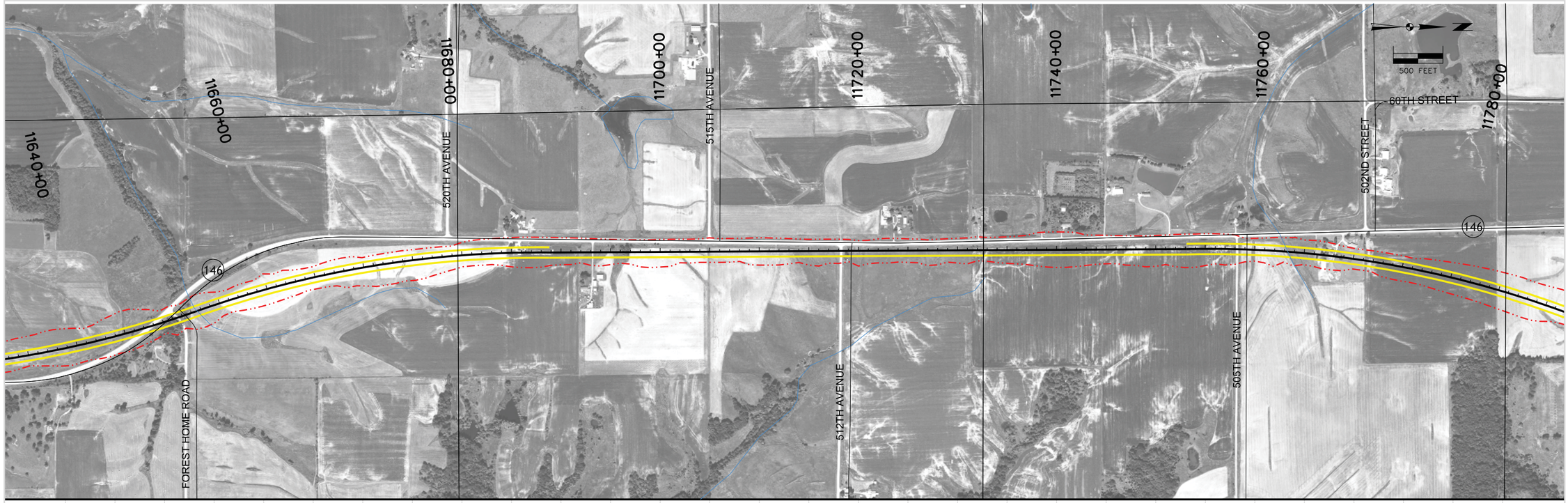

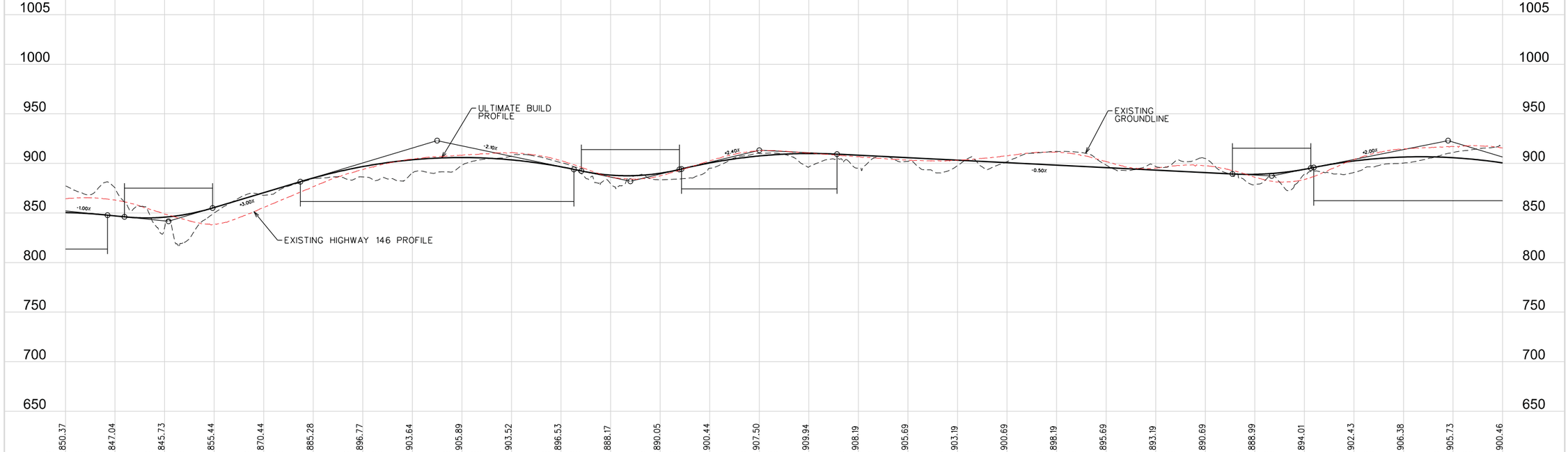

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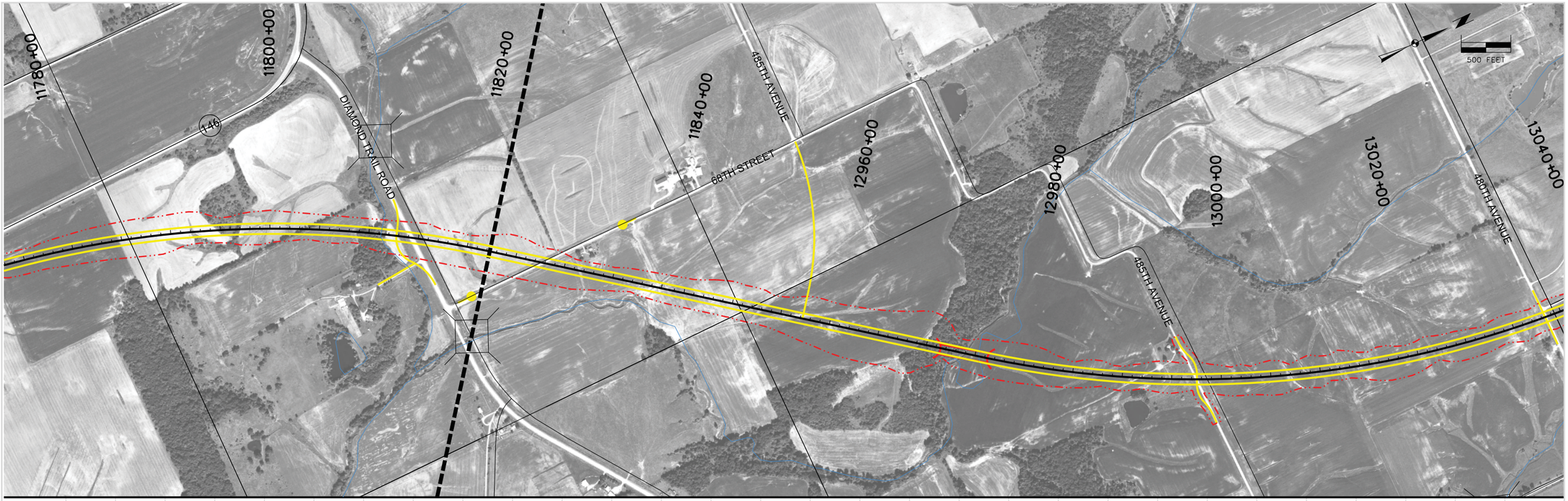

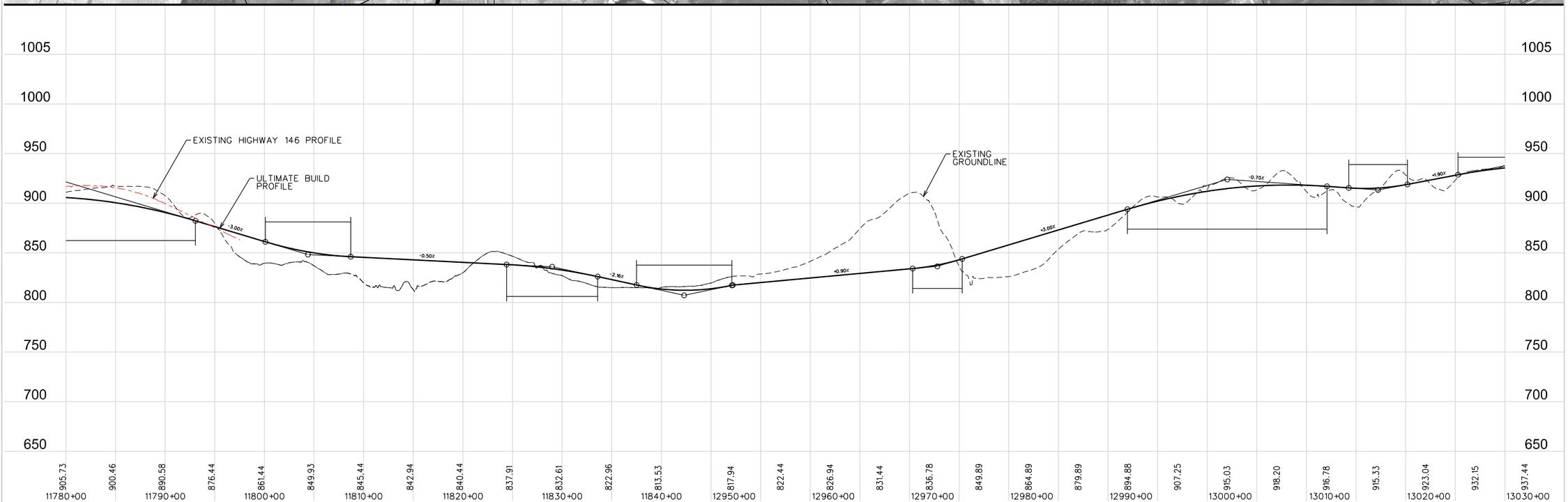

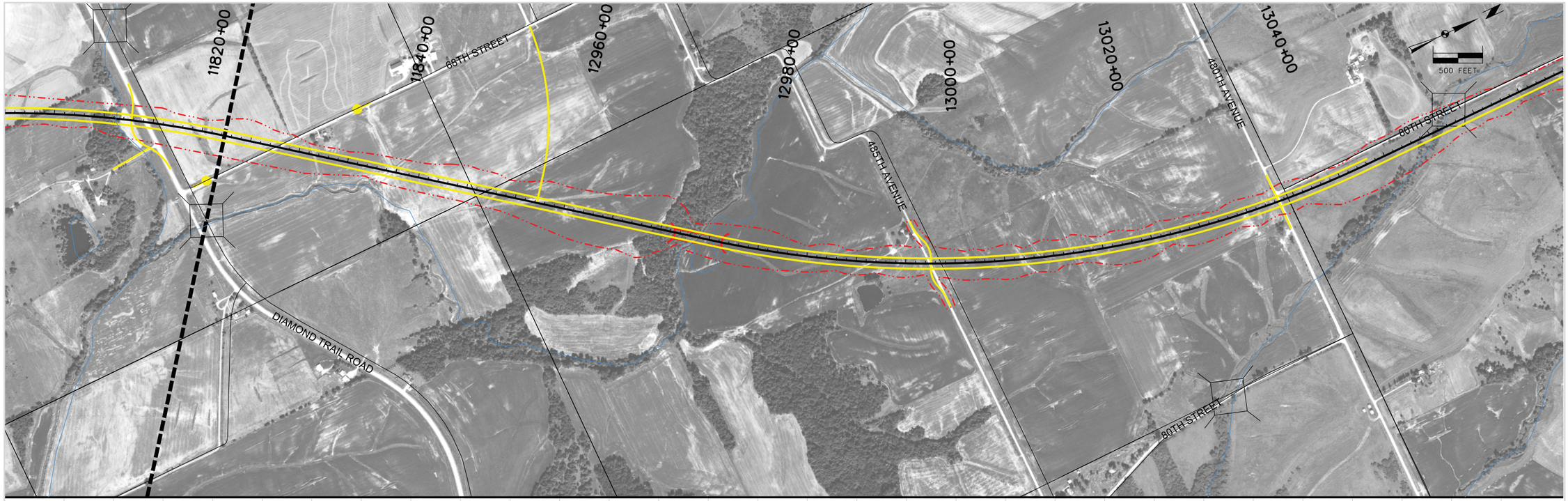

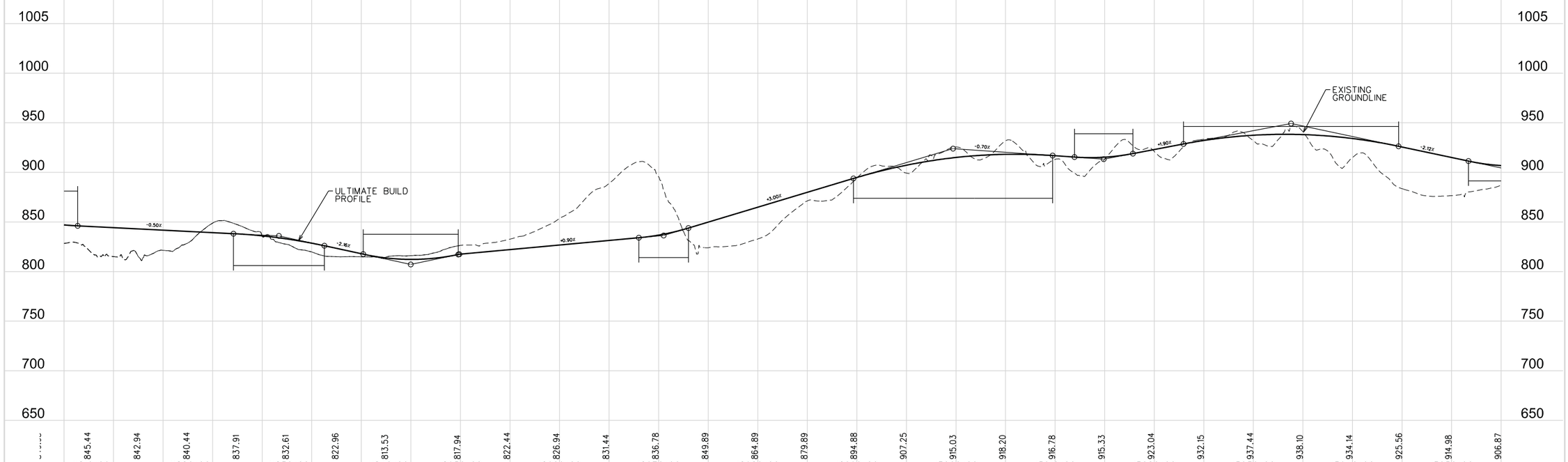

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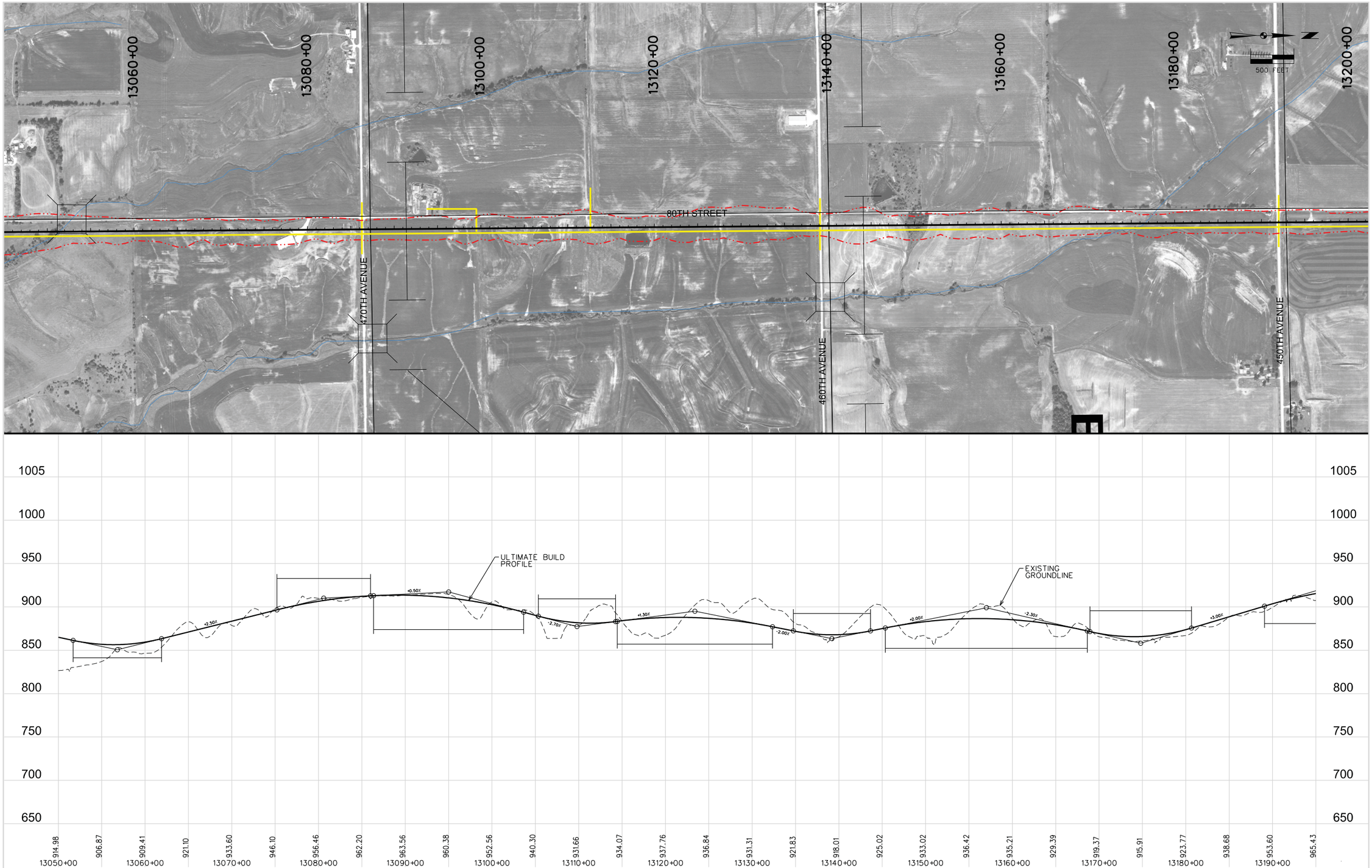

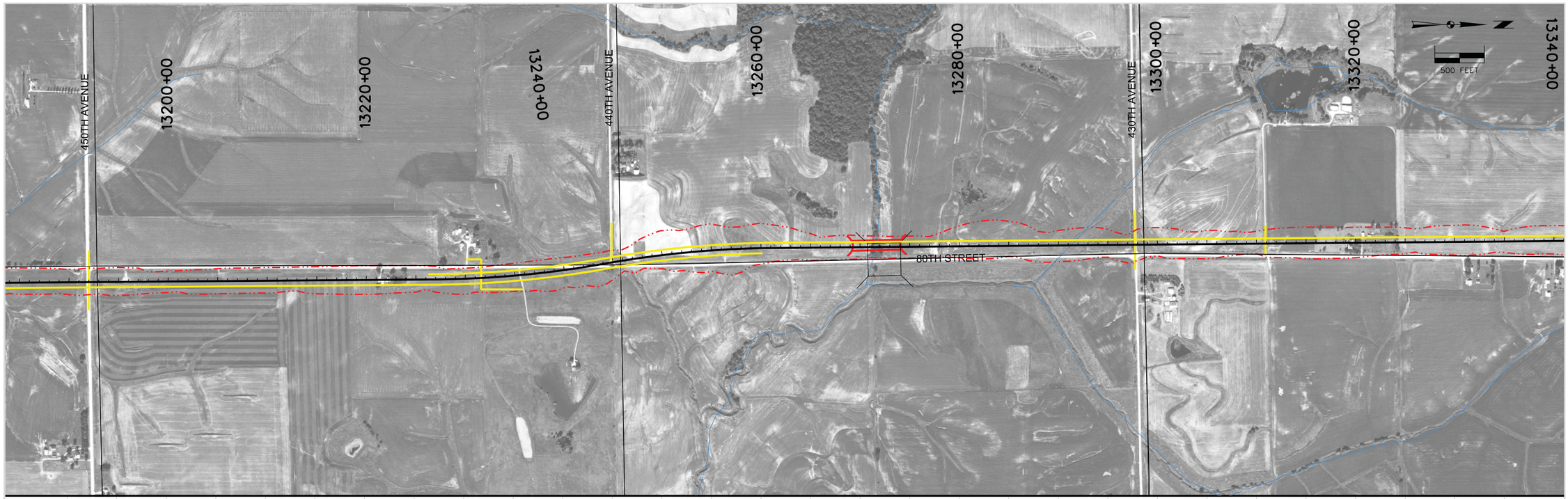

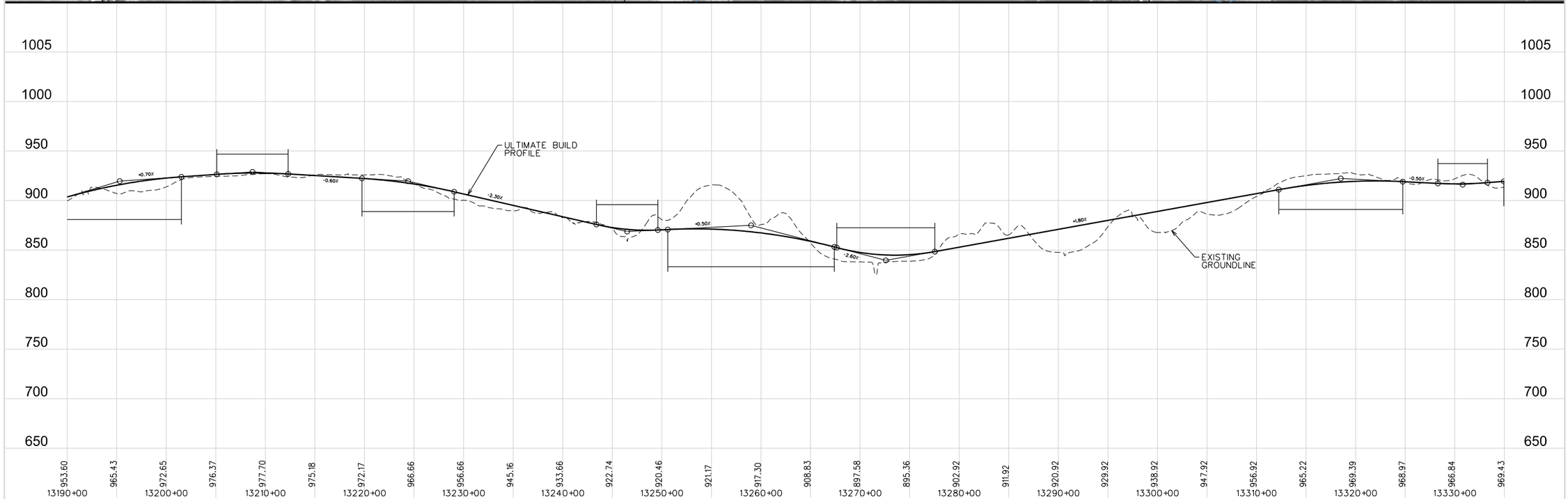

ULTIMATE BUILD PROFILE (WEST OPTION)

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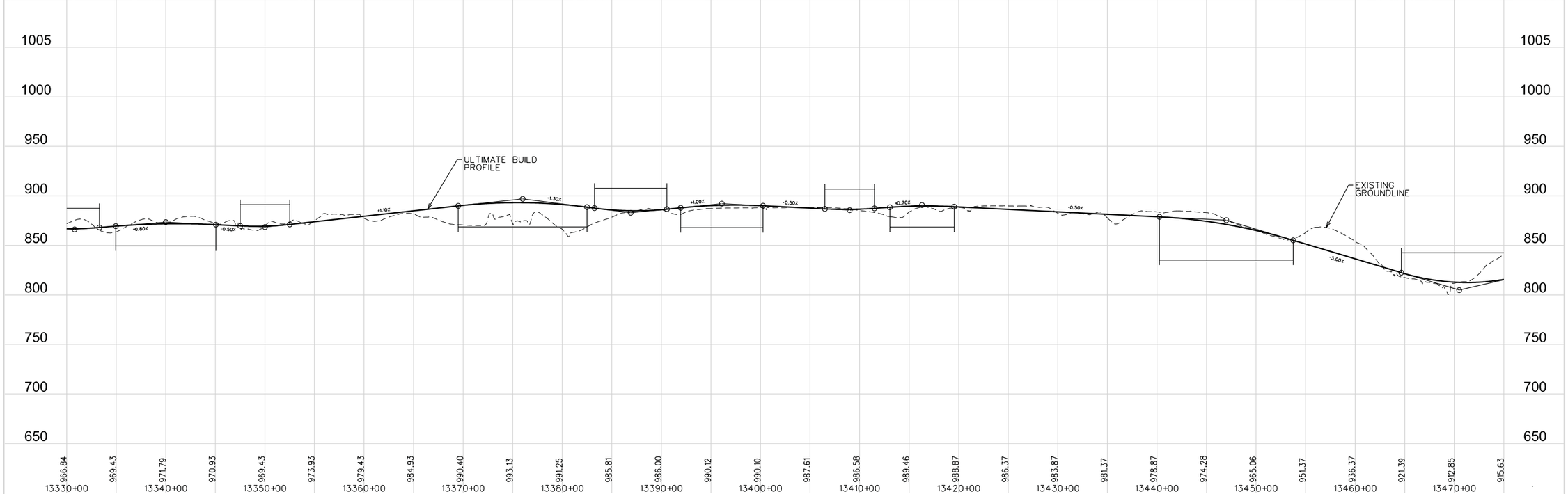
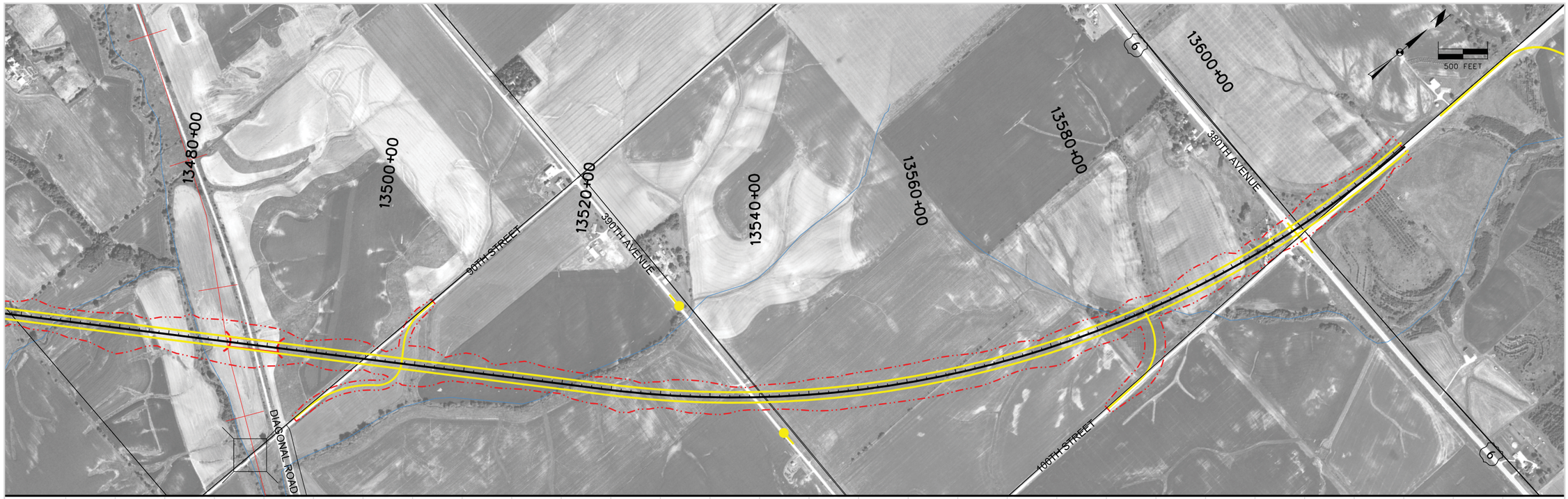
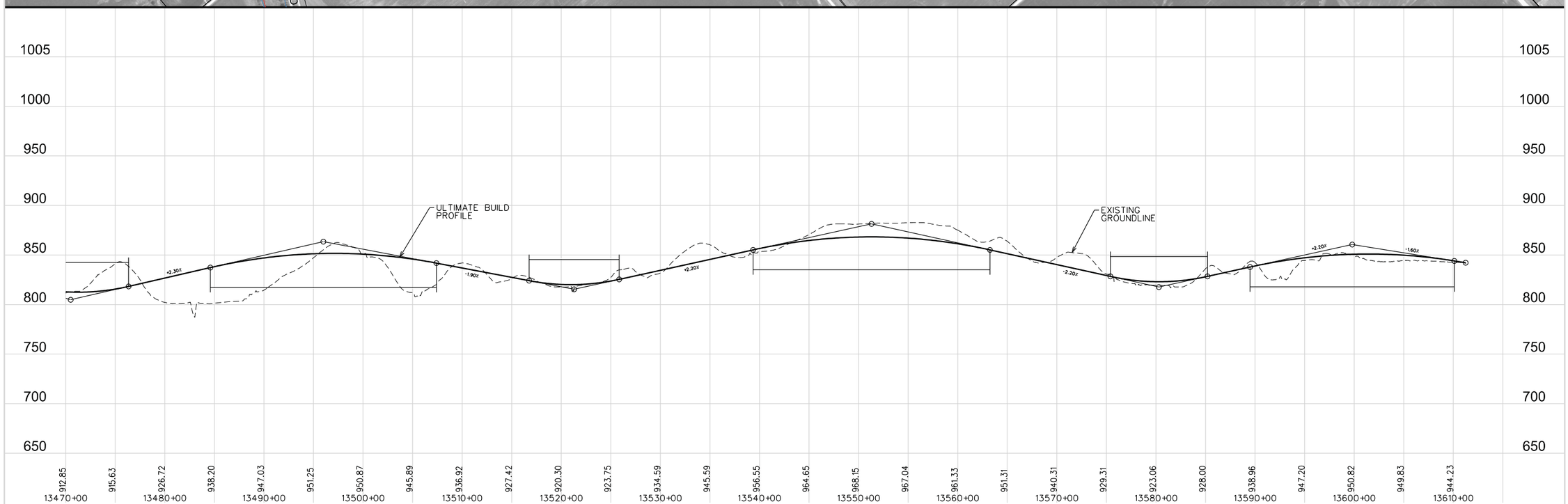
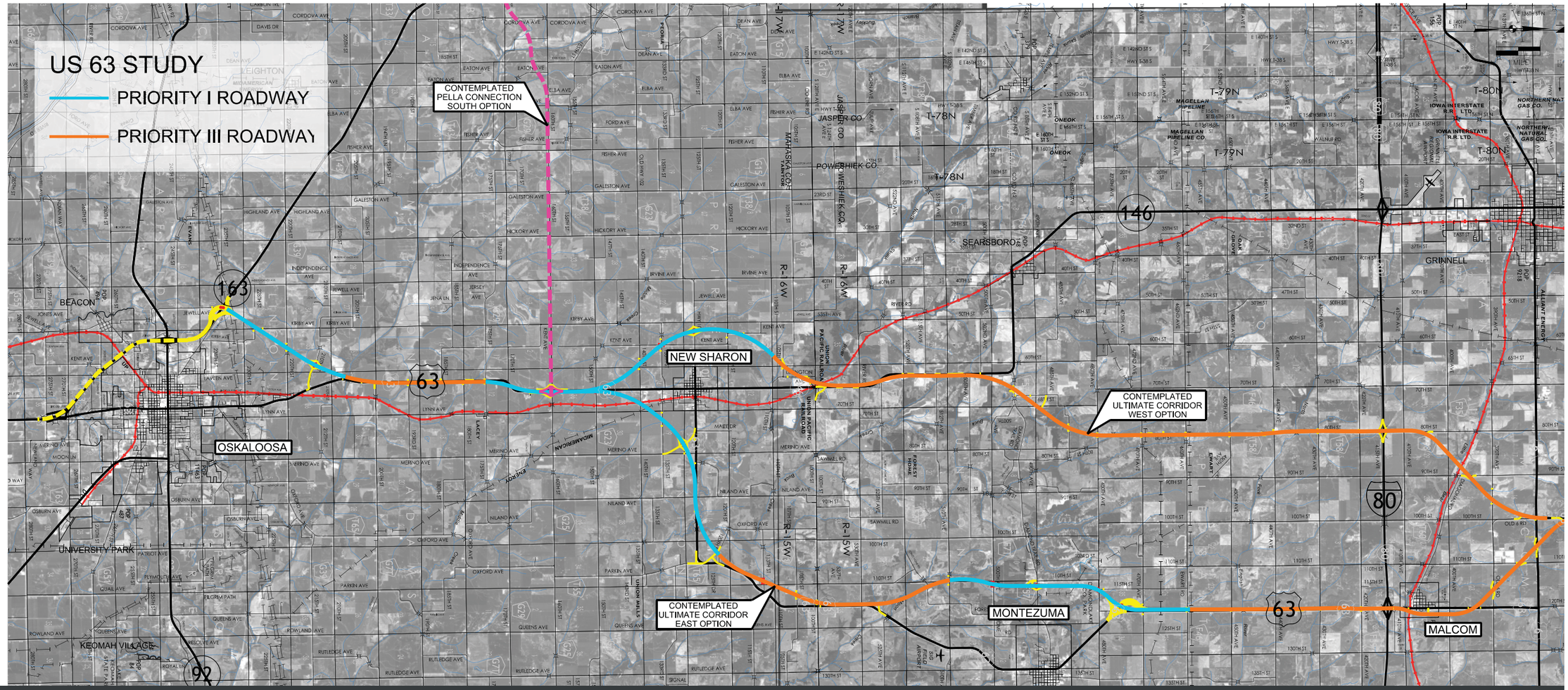






ULTIMATE BUILD PROFILE ESTIMATE (WEST OPTION)

ULTIMATE BUILD PROJECTED PRIORITY ACCESS CONTROL



Local Road Connections

With the proposed Ultimate Corridor options laid out, one of the first impacts felt within the corridor will be to the Local Road Network Connections. It was determined for the Ultimate Corridor that both Priority I and III access will be assigned to the proposed highway improvements. Priority I highway has fully controlled access. This only allows access to the facility at interchanges that are spaced at least one mile apart. Priority III highway allows access to the facility for both interchanges and at-grade intersections. It is preferred that a distance of one-quarter mile is used between access locations for Priority III. The locations of the proposed improvement options that are designated either as Priority I or III highway can be seen in this map. It was decided for the U.S. Highway 63 Corridor Loccation Study that locations along the proposed highway with interchanges near Oskaloosa, New Sharon, and Montezuma would be established with Priority I access. The local road network connections in Priority I areas had three alternatives: an interchange would be established with the new U.S. Highway 63, a bridge would be constructed over the roadway with no access, or the road would be closed with a cul-de-sac. The remaining roadway was designated as Priority III access. The local road network connections in Priority III area also had three possible alternatives: an interchange or an at-grade intersection would be established with the new U.S. Highway 63, a bridge would be constructed over the roadway with no access, or the road would be closed with a cul-de-sac. With these criteria, the local road network in the U.S. Highway 63 corridor study limits was evaluated. The results are displayed the segment maps, which also show a visual representation of these impacts.

SCORING EAST VS. WEST

Evaluation Criteria		Alignment Options							
ROUTE PERFORMANCE	Weight	West				East			
		Metrics	Value	Rankings	Score	Metrics	Value	Rankings	Score
Time of Travel	5	Time (min)	38.21	1.5	7.5	Time (min)	40.11	1.5	7.5
Highway Speed Maintained	4	Time (speed)	60	1.5	6	Time (speed)	60	1.5	6
Out of Distance Travel	5	Distance (miles)	3.32	2	10	Distance (miles)	5.22	1	5
Annual User Cost for Out-of-Distance Travel	4	Time (min)	3.32	2	8	Time (min)	5.22	1	4
Average Weight	4.5								
Total					31.5				22.5
Average					7.9				5.6

Evaluation Criteria		Alignment Options							
ECONOMIC CONSEQUENCES	Weight	West				East			
		Metrics	Value	Rankings	Score	Metrics	Value	Rankings	Score
Diagonal Severance	3	Distance (miles)	14.18	2	6	Distance (miles)	16.84	1	3
Pre-NEPA Considerations*									
Land Use Impact	2	H/M/L	L	1	2	H/M/L	M	2	4
Relocations (Residential & Commercial)	2	# of Relocations	23	2	4	# of Relocations	34	1	2
Energy Consumption	3	Distance (miles)	38.21	1.5	4.5	Distance (miles)	40.11	1.5	4.5
Agriculture	2	Acres	930	1	2	Acres	784	2	4
Average Weight	2.4								
Total					18.5				17.5
Average					3.7				3.5

Evaluation Criteria		Alignment Options							
ECONOMIC VITALITY	Weight	West				East			
		Metrics	Value	Rankings	Score	Metrics	Value	Rankings	Score
Economic Development	5	H/M/L	M	1	5	H/M/L	H	2	10
Local Road Network Impact	4	# of Impacts	15	2	8	# of Impacts	17	1	4
Regional Connectivity	5	H/M/L	M	1	5	H/M/L	H	2	10
Intermodal Opportunities	5	H/M/L	H	1.5	7.5	H/M/L	H	1.5	7.5
Average Weight	4.75								
Total					25.5				31.5
Average					6.4				7.9

Evaluation Criteria		Alignment Options							
SOCIETAL IMPACT	Weight	West				East			
		Metrics	Value	Rankings	Score	Metrics	Value	Rankings	Score
Proximity to US 63	5	H/M/L	M	1	5	H/M/L	H	2	10
Avoidance of Century Farms	1	#	1	2	2	#	3	1	1
Conflict Points/Predicted Safety	3	# of Accidents/Severity	34	1.5	4.5	# of Accidents/Severity	36	1.5	4.5
Pre-NEPA Considerations*									
Community Impacts	3	# of separations	0	2	6	# of separations	1	1	3
Environmental Justice	2	H/M/L	L	1.5	3	H/M/L	L	1.5	3
Visual Impacts	2	# of Receptors	17	1	2	# of Receptors	3	2	4
Air Quality	1	Distance (miles)	38.21	1.5	1.5	Distance (miles)	40.11	1.5	1.5
Noise	2	# of Receptors	24	2	4	# of Receptors	33	1	2
Regulated Material	1	**Preliminary study indicates that no Regulated Material Sites will be impacted by roadway improvements**							
Cultural Resources	2	#	7	2	4	#	8	1	2
Average Weight	2.2								
Total					32				31
Average					3.2				3.1

Evaluation Criteria		Alignment Options							
FUNDABILITY	Weight	West				East			
		Metrics	Value	Rankings	Score	Metrics	Value	Rankings	Score
Construction Cost	4	$ (Millions)	264	1.5	6	$ (Millions)	293	1.5	6
Phased Improvement Opportunities	5	H/M/L	M	1	5	H/M/L	H	2	10
Connectivity to Existing ROW	4	Distance (miles)	12.42	1	4	Distance (miles)	15.4	2	8
Average Weight	4.3								
Total					15				24
Average					5.0				8.0

Evaluation Criteria		Alignment Options							
NATURAL ENVIRO. IMPACTS	Weight	West				East			
		Metrics	Value	Rankings	Score	Metrics	Value	Rankings	Score
Pre-NEPA Considerations*									
Surface Water/Water Quality	1	# of Crossings	24	1	1	# of Crossings	19	2	2
Special River Designations	1	**Not Applicable - No Special River Designations in Iowa.**							
Wetlands	1	Acres	9.17	2	2	Acres	17.22	1	1
Floodplains/Hydraulics	1	Acres/# of Crossings	52.2/14	1.5	1.5	Acres/# of Crossings	59.1/11	1.5	1.5
Threatened & Endangered Species	2	Habitat Acres	26.5	2	4	Habitat Acres	95.55	1	2
Section 4(f) Property	3	Acres	0	2	6	Acres	5.21	1	3
Average Weight	1.5								
Total					14.5				9.5
Average					2.4				1.6

*Factors identified for Pre-NEPA consideration are resources protected by Federal Legislation. For purposes of this study, preliminary field surveys and literature searches have provided information toward the potential presence of these resources in the study corridor. Exact impacts will be addressed by future NEPA studies on standalone projects within the corridor. Efforts have been made to avoid these resources during the layout of the alignment options. However, the potential for impacts should be considered in the selection process.

FINAL COMPARISON	West	East
Alignment Total Score	**137**	**136**
Alignment Average Score	**28.6**	**29.7**

Recommendations

6.1 Ultimate Build and the Context of Budgetary Constraints & System Demands

The scoring comparison of the overall east and west alignment alternatives does not provide a compelling difference for choosing one over the other. Either would be a significant improvement over current accommodations, and each has only slightly different impacts.

To determine a preferred ultimate corridor we must review the more intangible factors.

Proximity to existing U.S. Highway 63 was identified early as an important criteria. From a service standpoint, it would maintain the proximity of the route to the same communities it now serves. However, there are two other major benefits to this consideration. First, construction of phased, priority improvements is more straightforward and understandable by the general public. For example, reconstruction of a sharp existing curve to a longer radius curve would be an obvious improvement, easy for the public to understand why the change is being made. Contrast that with rerouting the highway designation to a completely different route, or extending cross country for a long distance.

Second, there is the principle of managing existing assets. Utilizing, perserving, and enhancing portions of the existing roadway investment, is often the most responsible course of action.

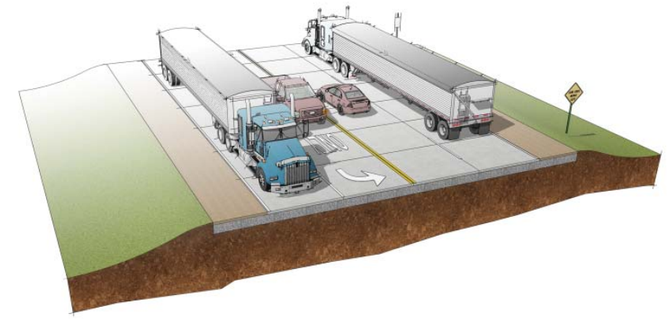
With these factors taken into consideration, it is recommended that the east option be utilized as the improvement route for U.S. Highway 63.

The west alignment can be redefined as a potential alignment for development if the east alignment becomes precluded for some reason. Per the foregoing analysis, it is recommended that the ultimate build configuration of U.S. Highway 63 be considered a four-lane divided facility with Priority III access control and potentially Priority I access control as noted.

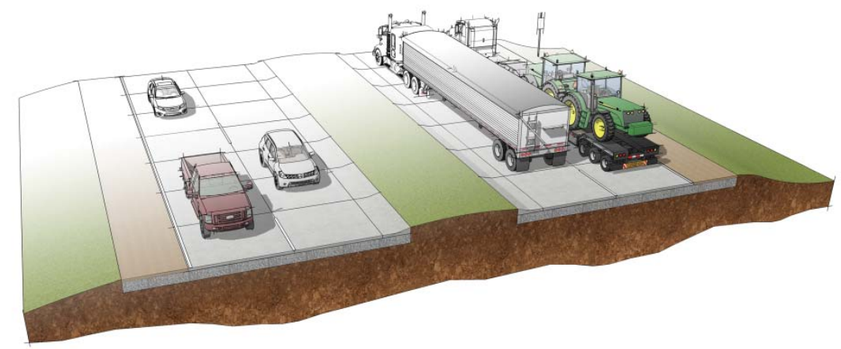
Further, recognizing the limitations of funding and the overall demands of the State's transportation system, interim and priority improvements should be considered to provide more immediate improvements to alleviate the most significant problem areas.

The interim and priority improvements are identified in Section 6.3. As the list of improvements was developed, three potential roadway cross sections were considered. The graphic at the right illustrates the varying roadway types that would meet the purpose and need of proposed improvements on U.S. Highway 63.

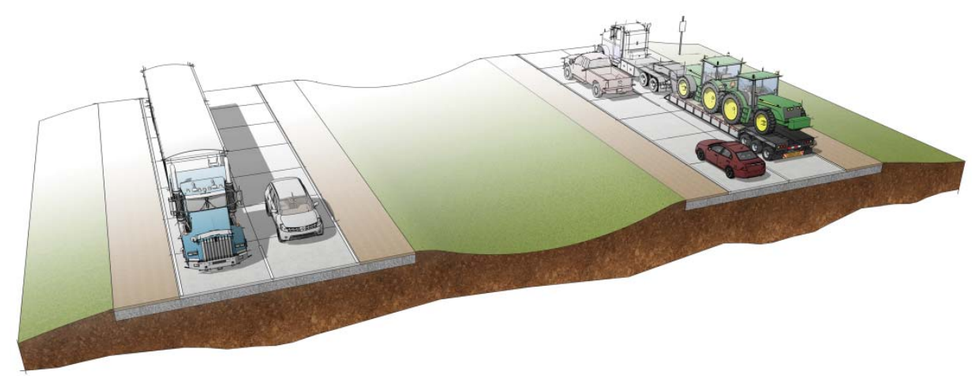
Lane Configuration Alternatives



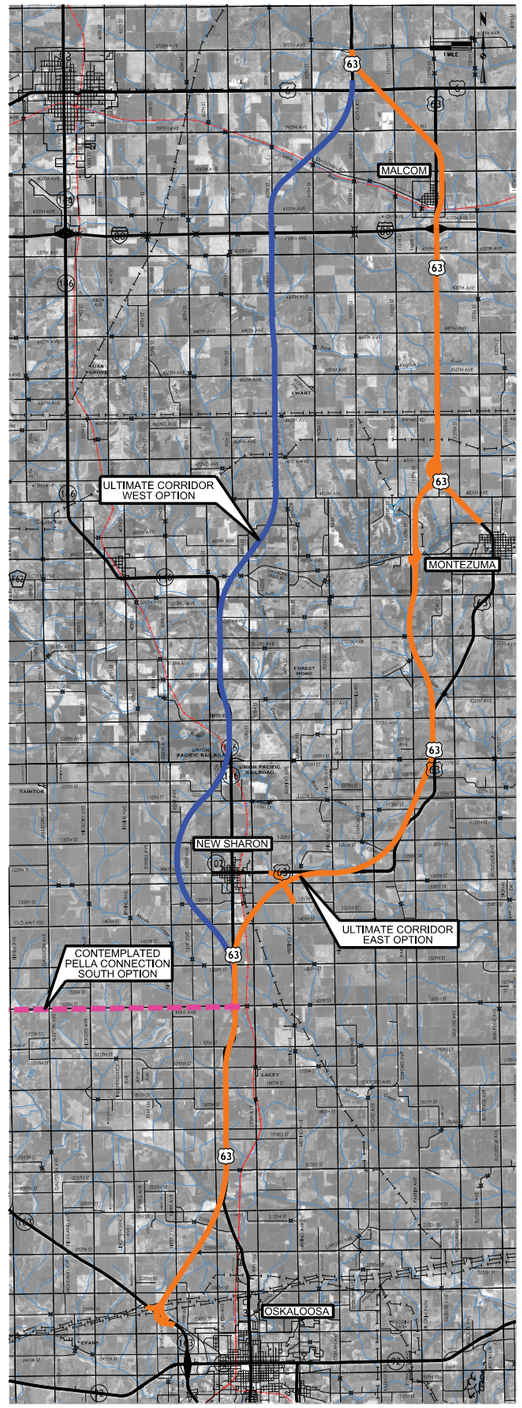
2-LANE RURAL ROADWAY WITH TURN LANE & CLIMBING LANE



4-LANE RURAL ARTERIAL



4-LANE RURAL EXPRESSWAY



6.2 Asset Management

Since the United States committed to building the interstate highway system in the late 1950's, the primary focus has been to continually expand the roadway system. America was not only flourishing economically, but the population was also increasing rapidly. This in turn led to more Americans purchasing more than one vehicle per household, and Americans were starting to take road trips around the country. With the ever increasing traffic volume on the roadway system, this led to the design and construction of more roadway systems. From the 1960's and onward this pattern continued without the full realization of the massive long-term commitment of maintenance this system would require. Starting in the early 1990's, the increasing highway maintenance cost was starting to become a burden and available resources were sometimes no longer effective. This led to the development of asset management programs.

The Transportation Curriculum Coordination Council defines asset management as the "strategic and systematic process of managing physical assets effectively throughout their lifecycle. It focuses on business and engineering practices for resource allocation and utilization, with the objective of better decision-making based upon quality information and well-defined objectives". In-short, the goal of asset management is to maintain the desired level of service of an asset at the lowest life cycle cost. The life cycle cost includes suitable measures for operating, sustaining, upgrading, and expanding the asset.

MAP-21 now requires all states to develop an asset management plan. The emphasis of funding has been shifted to managing and maintaining existing roadways. There are five key principles to follow when executing asset management: policy goals and objectives, planning and programming options, program delivery, system monitoring and performance results, and quality information analysis. Setting or defining policies and goals to be followed is the first step in asset management. This has already been or is being accomplished at the State and Federal level, and defines what other parties' role or responsibility is in achieving the set goals. Once the policy of asset management has been established, the long term planning and programming of an asset needs to be thought out. The details need to be analyzed to be able to reach a decision on what is the best option on the studied assets. Good business practices also need to be organized for asset management to be effective. Once the best course of action has been determined for an asset, the plan can be constructed in the field. When the project has been completed system monitoring and performance results will be studied. This includes the physical condition, the transportation level of service provided, and the effects of the asset to the connecting roadways and environment. This information will impact the transportation asset with decisions involving maintenance, improvements, and operations. This gathering of information leads to the last principle of asset management, which is quality information analysis. This principle provides a guideline for monitoring the transportation asset during and after construction. It ensures that there are routine inspections scheduled so quality data can be collected.

With the completion of the evaluation process of the U.S. Highway 63 Corridor Location Study for developing improvements for the existing U.S. Highway 63 corridor, two Ultimate Build options were identified for a final comparison. This comparison determined the east option was the best alternative in providing improvements to the U.S. Highway 63 Corridor.

6.3 Priority Improvements

Priority 1 – U.S. Highway 63 Oskaloosa NW Bypass

The largest inhibitor to the use and effectiveness of U.S. Highway 63 in the study area is the portion of the route through the City of Oskaloosa. U.S. Highway 63 maintains its original route through the City's historic downtown square, through a tight, downtown intersection with Iowa Highway 92. Accommodation of freight traffic, in particular, is troublesome in this area.

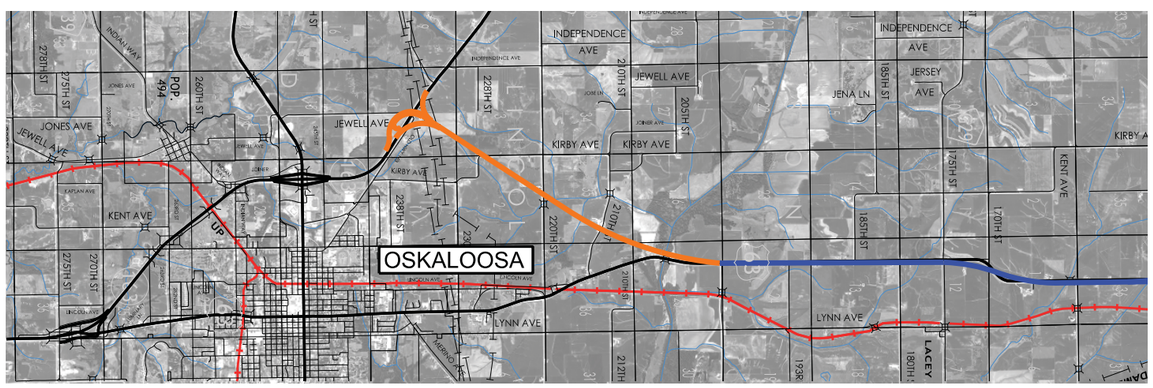
The envisioned U.S. Highway 63 Bypass will utilize much of existing Iowa Highway 163 (part of the Des Moines to Burlington expressway corridor) to bypass Oskaloosa to the west. North of the existing Iowa Highway 163 and Iowa Highway 92 interchange, a new interchange is proposed to divert U.S. Highway 63 traffic on a new alignment roadway to reconnect to existing U.S. Highway 63 north of Oskaloosa.

Proposed Construction: Construct full interchange at U.S. Highway 63 and Iowa Highway 163. Configure interchange to accommodate ultimate 4-lane section. The cross section must reduce to 2-lanes at existing U.S. Highway 63 north of Oskaloosa. The constructed mainline capacity through the length of the bypass should be determined based on design level traffic projections during the NEPA or preliminary design process. Oskaloosa anticipates development pressure in that quadrant of the City, particularly given proximity of U.S. Highway 63, Iowa Highway 163 and the proposed regional airport.

Proposed Right of Way: Acquire right of way width suitable for a 4-lane expressway.

Order of Magnitude Total Project Cost

$25,100,000



Priority 2 – Functional and structural improvements of U.S. Highway 63 from Montezuma to Interstate 80, and corridor preservation activities for a future U.S. Highway 63 Montezuma Bypass.

The analysis toward a preferred "Ultimate Build" improvement of U.S. Highway 63 yielded two viable alternative alignments, an east alignment using much of the existing U.S. Highway 63 general route, and a west alignment following a portion of Iowa Highway 146, then new alignment north to Interstate 80 and U.S. Highway 6.

The key factor which makes the east alignment along existing U.S. Highway 63 viable is the future consideration of an available bypass corridor around Montezuma. If no corridor is available, the west alignment option following Iowa Highway 146 is preferred. Additional study of the bypass route with significant public input is proposed, along with corridor preservation activities of the desired location.

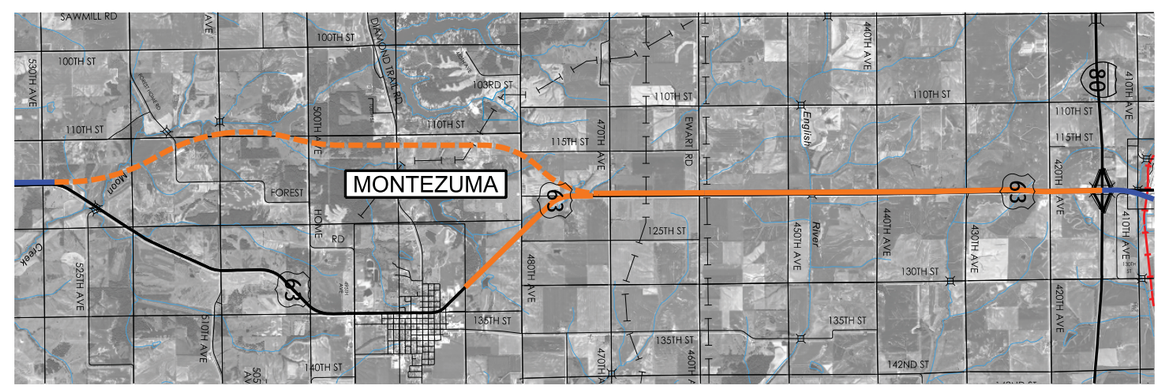
The segment of existing U.S. Highway 63 from Montezuma to Interstate 80 exhibits the most severe pavement distress remaining in the corridor. In addition, the segment has been studied for other functional and safety concerns. Near term structural improvements to this segment are needed, and consideration should be given to functional and safety improvements. Consideration of improvements toward a "super two" facility would be long lasting toward an appropriate level of service for the future.

Proposed Construction: Overlay or replacement of existing pavement. Strong consideration should be given to Super-2 improvements to correct geometric and sight distance deficiencies. New construction required at the reverse curves per current design standards.

Proposed Right of Way: Corridor preservation activities are proposed for a future Montezuma bypass. This can include acquisitions of opportunity but, moreover, requires a diligence in zoning and development as it occurs, to preserve the available corridor. For the segment from Montezuma to Interstate 80, consideration should be given to acquire right of way for a future 4-lane expressway as right of way for the current construction is explored.

Order of Magnitude Total Project Cost

$21,980,000



Priority 3 – U.S. Highway 63 New Sharon Bypass

Another significant functional constriction on existing U.S. Highway 63 is the right angle turn intersection with Iowa Highway 146 in New Sharon. Freight traffic attempting to make the turn in downtown New Sharon is restricted by available space, particularly with other traffic, pedestrians, and on-street parking in proximity. With the potential for a future Montezuma Bypass secured as noted in Priority 2, the bypass alignment can occur southeast of New Sharon between portions of the existing U.S. Highway 63 corridor.

It is anticipated that the removal of the southern constriction on U.S. Highway 63 at Oskaloosa by the proposed U.S. Highway 63 Oskaloosa NW Bypass may create a more urgent need in New Sharon if traffic volume increases as predicted.

Proposed Construction: New highway on new alignment is proposed. Design capacity of the New Sharon bypass should be determined during the NEPA process and preliminary design phase.

Proposed Right of Way: Acquire right of way for a 4-lane expressway.

Order of Magnitude Total Project Cost

$14,180,000

Priority 4 - U.S. Highway 63 Improvements from Oskaloosa to New Sharon

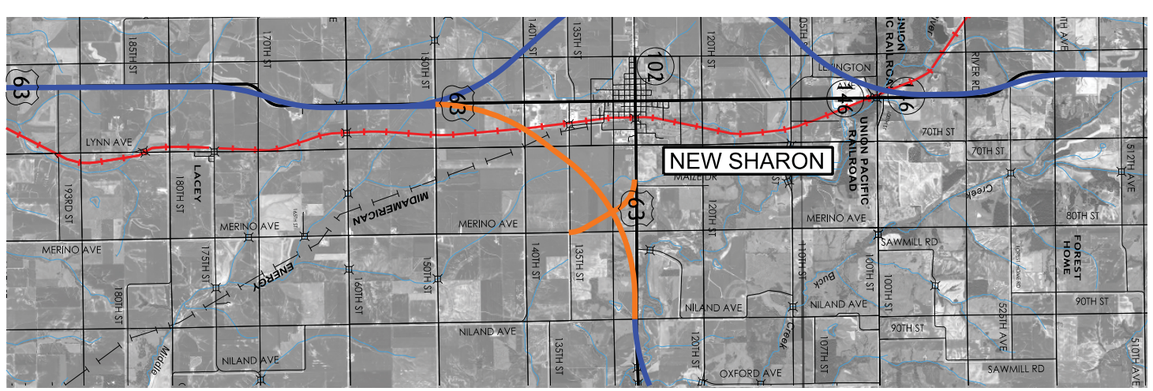
U.S Highway 63 north of Oskaloosa has the highest existing traffic counts of any portion of U.S. Highway 63 in the study area. This is partially due to the tendency of traffic to split between Iowa Highway 146 and U.S. Highway 63 at New Sharon, depending on destination. This trend would likely continue until U.S. Highway 63 is improved as a through route as part of the Commercial and Industrial Network, and National Highway System. As such, the traffic and safety needs are greater on this segment from Oskaloosa to New Sharon.

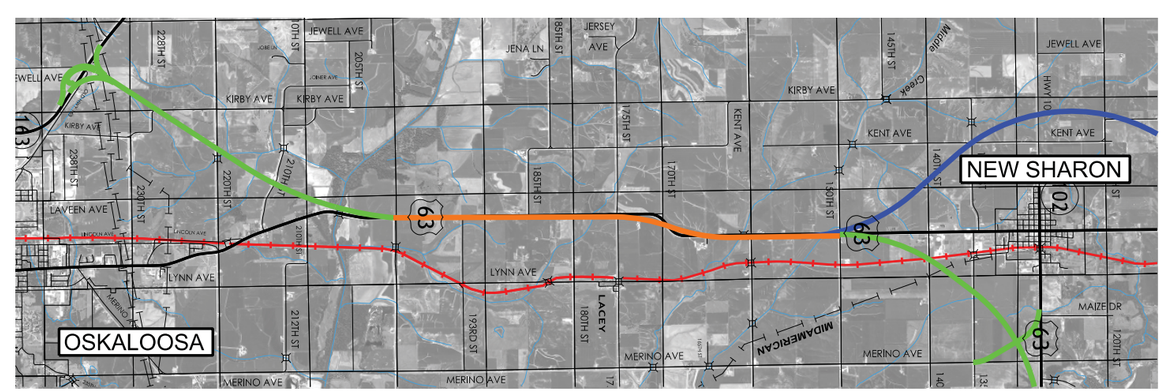
Proposed Construction: Opportunities include improvements to a Super-2 configuration, "have two, add two" construction for a 4-lane expressway or full 4-lane reconstruction based on the design level traffic projection at the time of project development.

Proposed Right of Way: As any of the above improvement requires right of way acquisition, acquire width suitable for a 4-lane expressway.

Order of Magnitude Total Project Cost

$17,310,000





Priority 5 – U.S. Highway 63 Improvements from New Sharon to Montezuma

This segment features the most antiquated geometry and vertical profile in the study area. Single vehicle accidents are predominant. Only 27% of this section meets current preferred design criteria. This section also has the least availability of passing zones. Increasing freight traffic would benefit significantly from geometric and capacity improvements.

Proposed Construction: New road on new alignment is required to accommodate current primary highway design standards. Super-2 or 4-lane expressway construction can be determined by traffic projection at the time of project development. Consider interim improvements from the proposed bypass into Montezuma, depending on the anticipated timing of the bypass construction.

Proposed Right of Way: Acquire right of way suitable for a 4-lane expressway.

Order of Magnitude Total Project Cost

$26,790,000

Priority 6 – U.S. Highway 63 Improvements from Malcom (Interstate 80) to U.S. Highway 6

The improvement of route performance on U.S. Highway 63 does not end at Interstate 80 if the overall goal is to make U.S. Highway 63 a significant north-south transportation corridor consistent with the Commercial and Industrial Network and National Highway System designations. Improvements would include alignment adjustments to eliminate right angle intersection turns at U.S. Highway 6. An improved, through-movement corridor would enhance the ability of U.S. Highway 63 north of the study area to continue as an important freight corridor to Waterloo.

Proposed Construction: The slight, east bypass of Malcom shown on the map is problematic and without corridor preservation activities may be precluded in the future. Consideration should be given to capacity improvements from the interchange through the developed part of Malcom. New alignment is proposed north to existing U.S. Highway 63 at U.S. Highway 6.

Proposed Right of Way: Consider corridor preservation activities east of Malcom. Acquire right of way for a 4-lane expressway north of Malcom.

Order of Magnitude Total Project Cost

$20,990,000

Priority 7 – U.S. Highway 63 Montezuma Bypass Construction

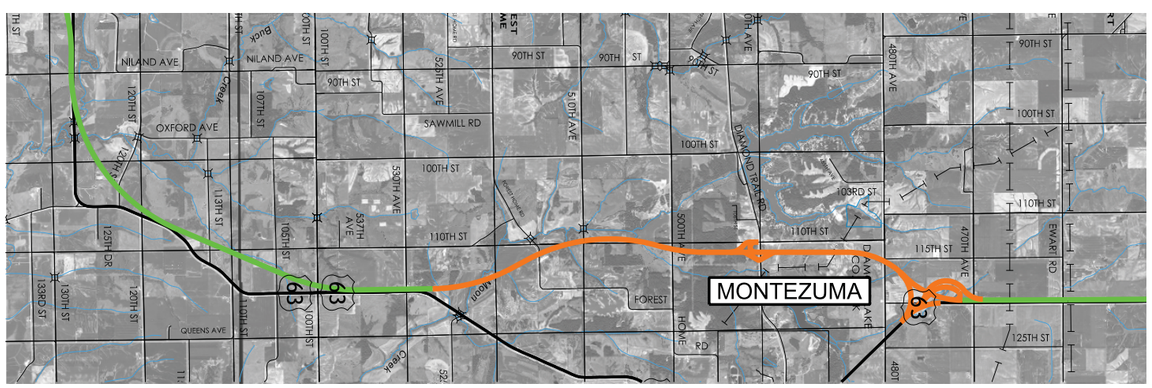
Existing U.S. Highway 63 is not required to stop in Montezuma, currently, although travel speed is reduced appropriately. As the rest of U.S. Highway 63 is improved, and traffic increases, associated issues may arise that may require additional intersection controls. Ultimately, a bypass of Montezuma is envisioned to the immediate west, to follow a major utility corridor between Diamond Lake and Lake Ponderosa.

Proposed Construction: It is reasonable to assume that by the time the Montezuma bypass is warranted and programmed, new 4-lane construction is recommended.

Proposed Right of Way: Acquire remaining right of way needed for 4-lane expressway.

Order of Magnitude Total Project Cost

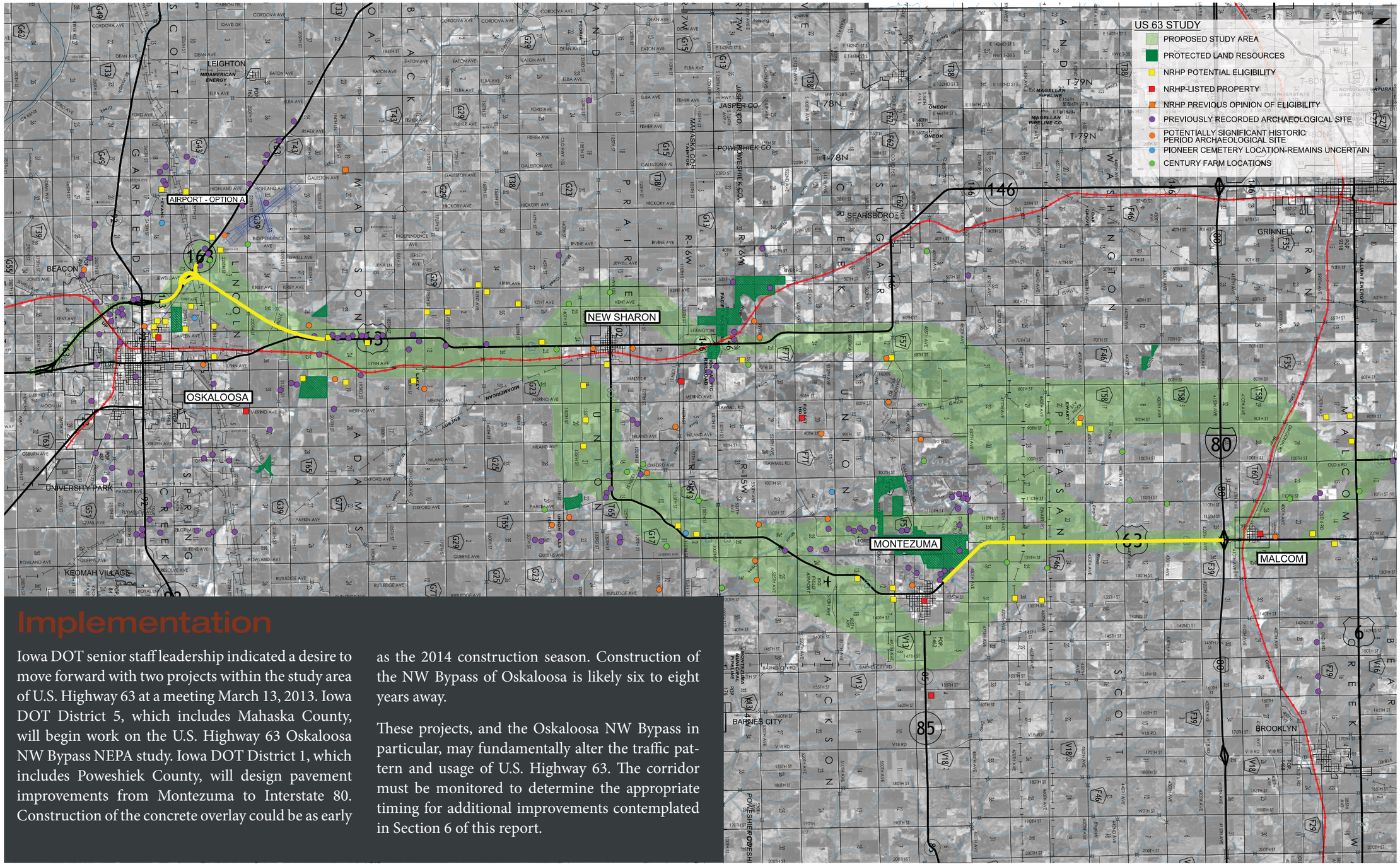
$60,750,000



Priority 8 – Improvement of all sections of U.S. Highway 63 to an "Ultimate Build" four-lane expressway, access controlled corridor.

For the construction of each of the Priority projects mentioned above, it is assumed that design level traffic projections will be made to appropriately determine the capacity needs of the corridor, whether they be a "Super-2" configuration, or a full, four lane divided roadway. The traffic projections in this study indicate that the ultimate configuration of four lanes should be a consideration, such that if a Super-2 facility is specified, that consideration is given to right of way purchase to not preclude an ultimate, future four lane section.

U.S. HIGHWAY 63 INITIAL PLANNED IMPROVEMENTS



Implementation

Iowa DOT senior staff leadership indicated a desire to move forward with two projects within the study area of U.S. Highway 63 at a meeting March 13, 2013. Iowa DOT District 5, which includes Mahaska County, will begin work on the U.S. Highway 63 Oskaloosa NW Bypass NEPA study. Iowa DOT District 1, which includes Poweshiek County, will design pavement improvements from Montezuma to Interstate 80. Construction of the concrete overlay could be as early as the 2014 construction season. Construction of the NW Bypass of Oskaloosa is likely six to eight years away.

These projects, and the Oskaloosa NW Bypass in particular, may fundamentally alter the traffic pattern and usage of U.S. Highway 63. The corridor must be monitored to determine the appropriate timing for additional improvements contemplated in Section 6 of this report.

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Iowa Department of Transportation

Major Cause Summary

US 63 (through Oskaloosa)

Report Version 1.1 Jan 2005

Analysis Years: 2007 [50], 2008 [48], 2009 [30], 2010 [38], 2011 [26]

Crash Summary:

Fatal	1
Major Injury	3
Minor Injury	24
Possible/Unknown	28
PDO	136
Total Crashes	192

Injury Summary:

Fatal	1
Major Injury	4
Minor Injury	27
Possible	45
Unknown	2
Total Injuries	79

Surface Condition Summary:

Dry	135
Wet	34
Ice	5
Snow	12
Slush	3
Sand/Dirt/Oil/Gravel	1
Water	-
Other	-
Unknown	1
Not Reported	1
Total Crashes	192

TOT Property Damage: $771,825

AVG Property Damage: $4,020

Major Cause Summary:

3	Animal
16	Ran Traffic Signal
5	Ran Stop Sign
3	Crossed Centerline
3	FTYROW: At Uncontrolled Intersection
1	FTYROW: Making Right Turn on Red Signal
37	FTYROW: From Stop Sign
	FTYROW: From Yield Sign
28	FTYROW: Making Left Turn
3	FTYROW: From Driveway
5	FTYROW: From Parked Position
	FTYROW: To Pedestrian
7	FTYROW: Other (explain in narrative)
1	Traveling Wrong Way or on Wrong Side of Rd
10	Driving Too Fast for Conditions
	Exceeded Authorized Speed
8	Made Improper Turn
	Improper Lane Change
16	Followed Too Close
	Disregarded Railroad Signal
	Disregarded Warning Sign
	Operating Vehicle in Reckless/Aggressive Manner
	Improper Backing
	Illegally Parked/Unattended
3	Swerving/Evasive Action
	Over-Correcting/Over-Steering
	Downhill Runaway
	Equipment Failure
	Separation of Units
1	Ran Off Road - Right
1	Ran Off Road - Straight
2	Ran Off Road - Left
1	Lost Control
	Inattentive/Distracted By: Passenger
2	Inattentive/Distracted By: Use of Phone or Other
	Inattentive/Distracted By: Fallen Object
	Inattentive/Distracted By: Fatigued/Asleep
3	Other: Vision Obstructed
	Oversized Load/ Oversized Vehicle
	Cargo/Equipment Loss or Shift
22	Other: Other Improper Action
5	Unknown
6	Other: No Improper Action
	None Indicated

Selection Filter:

((YEAR = 2007 or YEAR = 2008 or YEAR = 2009 or YEAR = 2010 or YEAR = 2011))

Analyst: GEK

Notes: 2007-2011

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Iowa Department of Transportation

Major Cause Summary

US 63 (Oskaloosa to New Sharon)

Report Version 1.1 Jan 2005

Analysis Years: 2007 [23], 2008 [15], 2009 [9], 2010 [12], 2011 [5]

Crash Summary:

Fatal	1
Major Injury	6
Minor Injury	11
Possible/Unknown	13
PDO	33
Total Crashes	64

Injury Summary:

Fatal	1
Major Injury	13
Minor Injury	15
Possible	19
Unknown	1
Total Injuries	49

Surface Condition Summary:

Dry	32
Wet	7
Ice	8
Snow	13
Slush	3
Sand/Dirt/Oil/Gravel	-
Water	-
Other	-
Unknown	-
Not Reported	1
Total Crashes	64

TOT Property Damage: $584,370

AVG Property Damage: $9,131

Major Cause Summary:

2	Animal
	Ran Traffic Signal
	Ran Stop Sign
6	Crossed Centerline
	FTYROW: At Uncontrolled Intersection
	FTYROW: Making Right Turn on Red Signal
4	FTYROW: From Stop Sign
	FTYROW: From Yield Sign
2	FTYROW: Making Left Turn
	FTYROW: From Driveway
	FTYROW: From Parked Position
	FTYROW: To Pedestrian
3	FTYROW: Other (explain in narrative)
	Traveling Wrong Way or on Wrong Side of Rd
11	Driving Too Fast for Conditions
1	Exceeded Authorized Speed
	Made Improper Turn
	Improper Lane Change
5	Followed Too Close
	Disregarded Railroad Signal
	Disregarded Warning Sign
1	Operating Vehicle in Reckless/Aggressive Manner
	Improper Backing
	Illegally Parked/Unattended
8	Swerving/Evasive Action
	Over-Correcting/Over-Steering
	Downhill Runaway
	Equipment Failure
	Separation of Units
8	Ran Off Road - Right
	Ran Off Road - Straight
5	Ran Off Road - Left
2	Lost Control
	Inattentive/Distracted By: Passenger
	Inattentive/Distracted By: Use of Phone or Other
	Inattentive/Distracted By: Fallen Object
1	Inattentive/Distracted By: Fatigued/Asleep
	Other: Vision Obstructed
	Oversized Load/ Oversized Vehicle
	Cargo/Equipment Loss or Shift
2	Other: Other Improper Action
1	Unknown
2	Other: No Improper Action
	None Indicated

Selection Filter:

((YEAR = 2007 or YEAR = 2008 or YEAR = 2009 or YEAR = 2010 or YEAR = 2011))

Analyst: GEK

Notes: 2007-2011

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Iowa Department of Transportation

Major Cause Summary

US 63 (through New Sharon)

Report Version 1.1 Jan 2005

Analysis Years: 2007 [3], 2008 [2], 2009 [2], 2010 [4], 2011 [3]

Crash Summary:

Fatal	-
Major Injury	1
Minor Injury	1
Possible/Unknown	1
PDO	11
Total Crashes	14

Injury Summary:

Fatal	-
Major Injury	1
Minor Injury	1
Possible	2
Unknown	-
Total Injuries	4

Surface Condition Summary:

Dry	12
Wet	1
Ice	1
Snow	-
Slush	-
Sand/Dirt/Oil/Gravel	-
Water	-
Other	-
Unknown	-
Not Reported	-
Total Crashes	14

TOT Property Damage: $44,300

AVG Property Damage: $3,164

Major Cause Summary:

	Animal
1	Ran Traffic Signal
	Ran Stop Sign
1	Crossed Centerline
	FTYROW: At Uncontrolled Intersection
	FTYROW: Making Right Turn on Red Signal
1	FTYROW: From Stop Sign
	FTYROW: From Yield Sign
	FTYROW: Making Left Turn
	FTYROW: From Driveway
	FTYROW: From Parked Position
	FTYROW: To Pedestrian
1	FTYROW: Other (explain in narrative)
	Traveling Wrong Way or on Wrong Side of Rd
	Driving Too Fast for Conditions
	Exceeded Authorized Speed
	Made Improper Turn
	Improper Lane Change
2	Followed Too Close
	Disregarded Railroad Signal
	Disregarded Warning Sign
1	Operating Vehicle in Reckless/Aggressive Manner
	Improper Backing
	Illegally Parked/Unattended
	Swerving/Evasive Action
	Over-Correcting/Over-Steering
	Downhill Runaway
	Equipment Failure
	Separation of Units
2	Ran Off Road - Right
	Ran Off Road - Straight
	Ran Off Road - Left
1	Lost Control
	Inattentive/Distracted By: Passenger
	Inattentive/Distracted By: Use of Phone or Other
	Inattentive/Distracted By: Fallen Object
	Inattentive/Distracted By: Fatigued/Asleep
	Other: Vision Obstructed
	Oversized Load/ Oversized Vehicle
	Cargo/Equipment Loss or Shift
3	Other: Other Improper Action
1	Unknown
	Other: No Improper Action
	None Indicated

Selection Filter:

((YEAR = 2007 or YEAR = 2008 or YEAR = 2009 or YEAR = 2010 or YEAR = 2011))

Analyst: GEK

Notes: 2007-2011

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Iowa Department of Transportation

Major Cause Summary

US 63 (New Sharon to Montezuma)

Report Version 1.1 Jan 2005

Analysis Years: 2007 [5], 2008 [4], 2009 [6], 2010 [8], 2011 [10]

Crash Summary:

Fatal	-
Major Injury	1
Minor Injury	3
Possible/Unknown	9
PDO	20
Total Crashes	33

Injury Summary:

Fatal	-
Major Injury	1
Minor Injury	5
Possible	10
Unknown	-
Total Injuries	16

Surface Condition Summary:

Dry	20
Wet	4
Ice	1
Snow	1
Slush	1
Sand/Dirt/Oil/Gravel	-
Water	-
Other	-
Unknown	3
Not Reported	3
Total Crashes	33

TOT Property Damage: $270,814

AVG Property Damage: $8,206

Major Cause Summary:

4	Animal
	Ran Traffic Signal
1	Ran Stop Sign
3	Crossed Centerline
	FTYROW: At Uncontrolled Intersection
	FTYROW: Making Right Turn on Red Signal
	FTYROW: From Stop Sign
	FTYROW: From Yield Sign
	FTYROW: Making Left Turn
	FTYROW: From Driveway
	FTYROW: From Parked Position
	FTYROW: To Pedestrian
	FTYROW: Other (explain in narrative)
	Traveling Wrong Way or on Wrong Side of Rd
1	Driving Too Fast for Conditions
	Exceeded Authorized Speed
	Made Improper Turn
	Improper Lane Change
1	Followed Too Close
	Disregarded Railroad Signal
	Disregarded Warning Sign
	Operating Vehicle in Reckless/Aggressive Manner
	Improper Backing
	Illegally Parked/Unattended
9	Swerving/Evasive Action
	Over-Correcting/Over-Steering
	Downhill Runaway
1	Equipment Failure
	Separation of Units
3	Ran Off Road - Right
	Ran Off Road - Straight
4	Ran Off Road - Left
1	Lost Control
1	Inattentive/Distracted By: Passenger
	Inattentive/Distracted By: Use of Phone or Other
	Inattentive/Distracted By: Fallen Object
	Inattentive/Distracted By: Fatigued/Asleep
	Other: Vision Obstructed
	Oversized Load/ Oversized Vehicle
	Cargo/Equipment Loss or Shift
1	Other: Other Improper Action
1	Unknown
2	Other: No Improper Action
	None Indicated

Selection Filter:

((YEAR = 2007 or YEAR = 2008 or YEAR = 2009 or YEAR = 2010 or YEAR = 2011))

Analyst: GEK

Notes: 2007-2011

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Iowa Department of Transportation

Major Cause Summary

US 63 (through Montezuma)

Report Version 1.1 Jan 2005

Analysis Years: 2007 [2], 2008 [3], 2009 [3], 2010 [6], 2011 [5]

Crash Summary:

Fatal	-
Major Injury	-
Minor Injury	2
Possible/Unknown	4
PDO	13
Total Crashes	19

Injury Summary:

Fatal	-
Major Injury	-
Minor Injury	2
Possible	5
Unknown	-
Total Injuries	7

Surface Condition Summary:

Dry	13
Wet	4
Ice	-
Snow	2
Slush	-
Sand/Dirt/Oil/Gravel	-
Water	-
Other	-
Unknown	-
Not Reported	-
Total Crashes	19

TOT Property Damage: $98,300

AVG Property Damage: $5,174

Major Cause Summary:

	Animal
	Ran Traffic Signal
4	Ran Stop Sign
1	Crossed Centerline
	FTYROW: At Uncontrolled Intersection
	FTYROW: Making Right Turn on Red Signal
6	FTYROW: From Stop Sign
	FTYROW: From Yield Sign
2	FTYROW: Making Left Turn
	FTYROW: From Driveway
	FTYROW: From Parked Position
	FTYROW: To Pedestrian
	FTYROW: Other (explain in narrative)
	Traveling Wrong Way or on Wrong Side of Rd
	Driving Too Fast for Conditions
	Exceeded Authorized Speed
2	Made Improper Turn
	Improper Lane Change
	Followed Too Close
	Disregarded Railroad Signal
	Disregarded Warning Sign
1	Operating Vehicle in Reckless/Aggressive Manner
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	Equipment Failure
	Separation of Units
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	Ran Off Road - Straight
	Ran Off Road - Left
	Lost Control
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	Inattentive/Distracted By: Use of Phone or Other
	Inattentive/Distracted By: Fallen Object
	Inattentive/Distracted By: Fatigued/Asleep
	Other: Vision Obstructed
	Oversized Load/ Oversized Vehicle
	Cargo/Equipment Loss or Shift
1	Other: Other Improper Action
	Unknown
	Other: No Improper Action
	None Indicated

Selection Filter:

((YEAR = 2007 or YEAR = 2008 or YEAR = 2009 or YEAR = 2010 or YEAR = 2011))

Analyst: GEK

Notes: 2007-2011

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Iowa Department of Transportation

Major Cause Summary

US 63 (Montezuma to I-80)

Report Version 1.1 Jan 2005

Analysis Years: 2007 [17], 2008 [9], 2009 [4], 2010 [7], 2011 [4]

Crash Summary:

Fatal	2
Major Injury	-
Minor Injury	2
Possible/Unknown	4
PDO	33
Total Crashes	41

Injury Summary:

Fatal	3
Major Injury	3
Minor Injury	3
Possible	5
Unknown	-
Total Injuries	14

Surface Condition Summary:

Dry	23
Wet	2
Ice	2
Snow	3
Slush	1
Sand/Dirt/Oil/Gravel	-
Water	-
Other	-
Unknown	-
Not Reported	10
Total Crashes	41

TOT Property Damage: $262,275

AVG Property Damage: $6,397

Major Cause Summary:

16	Animal
	Ran Traffic Signal
3	Ran Stop Sign
4	Crossed Centerline
	FTYROW: At Uncontrolled Intersection
	FTYROW: Making Right Turn on Red Signal
	FTYROW: From Stop Sign
	FTYROW: From Yield Sign
	FTYROW: Making Left Turn
	FTYROW: From Driveway
	FTYROW: From Parked Position
	FTYROW: To Pedestrian
	FTYROW: Other (explain in narrative)
	Traveling Wrong Way or on Wrong Side of Rd
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	Exceeded Authorized Speed
1	Made Improper Turn
	Improper Lane Change
2	Followed Too Close
	Disregarded Railroad Signal
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	Downhill Runaway
	Equipment Failure
	Separation of Units
5	Ran Off Road - Right
	Ran Off Road - Straight
2	Ran Off Road - Left
1	Lost Control
	Inattentive/Distracted By: Passenger
	Inattentive/Distracted By: Use of Phone or Other
	Inattentive/Distracted By: Fallen Object
	Inattentive/Distracted By: Fatigued/Asleep
1	Other: Vision Obstructed
	Oversized Load/ Oversized Vehicle
	Cargo/Equipment Loss or Shift
	Other: Other Improper Action
	Unknown
	Other: No Improper Action
	None Indicated

Selection Filter:

((YEAR = 2007 or YEAR = 2008 or YEAR = 2009 or YEAR = 2010 or YEAR = 2011))

Analyst: GEK

Notes: 2007-2011

11/8/2012 **Crash Mapping Analysis Tool 3.6.0** **Page:** 1 of 1

Iowa Department of Transportation

Major Cause Summary

US 63 (I-80 - US 6 north of Malcom)

Report Version 1.1 Jan 2005

Analysis Years: 2007 [5], 2008 [8], 2009 [5], 2010 [3], 2011 [6]

Crash Summary:

Fatal	1
Major Injury	-
Minor Injury	1
Possible/Unknown	8
PDO	17
Total Crashes	27

Injury Summary:

Fatal	1
Major Injury	-
Minor Injury	1
Possible	11
Unknown	2
Total Injuries	15

TOT Property Damage: $271,500

AVG Property Damage: $10,056

Surface Condition Summary:

Dry	15
Wet	2
Ice	1
Snow	1
Slush	1
Sand/Dirt/Oil/Gravel	-
Water	-
Other	-
Unknown	-
Not Reported	7
Total Crashes	27

Major Cause Summary:

9	Animal
	Ran Traffic Signal
4	Ran Stop Sign
	Crossed Centerline
	FTYROW: At Uncontrolled Intersection
	FTYROW: Making Right Turn on Red Signal
7	FTYROW: From Stop Sign
	FTYROW: From Yield Sign
	FTYROW: Making Left Turn
	FTYROW: From Driveway
	FTYROW: From Parked Position
	FTYROW: To Pedestrian
1	FTYROW: Other (explain in narrative)
1	Traveling Wrong Way or on Wrong Side of Rd
	Driving Too Fast for Conditions
	Exceeded Authorized Speed
	Made Improper Turn
	Improper Lane Change
	Followed Too Close
	Disregarded Railroad Signal
	Disregarded Warning Sign
	Operating Vehicle in Reckless/Aggressive Manner
	Improper Backing
	Illegally Parked/Unattended
1	Swerving/Evasive Action
	Over-Correcting/Over-Steering
	Downhill Runaway
	Equipment Failure
	Separation of Units
	Ran Off Road - Right
	Ran Off Road - Straight
2	Ran Off Road - Left
1	Lost Control
	Inattentive/Distracted By: Passenger
	Inattentive/Distracted By: Use of Phone or Other
	Inattentive/Distracted By: Fallen Object
	Inattentive/Distracted By: Fatigued/Asleep
	Other: Vision Obstructed
	Oversized Load/ Oversized Vehicle
	Cargo/Equipment Loss or Shift
1	Other: Other Improper Action
	Unknown
	Other: No Improper Action
	None Indicated

Selection Filter:

((YEAR = 2007 or YEAR = 2008 or YEAR = 2009 or YEAR = 2010 or YEAR = 2011))

Analyst: GEK

Notes: 2007-2011

4/12/2013 **Crash Mapping Analysis Tool 3.6.0** **Page:** 1 of 1

Memorandum

To: Project File; Corridor Study Appendix **Date:** 5/15/2013

From: Greg Karssen, Mark Perington

CC: Rich Voelker; Dale Harrington; Brenna Fall

RE: Highway Safety Manual – Predictive Crash Methodology
US 63 Corridor Study
S&A Proj. No.: 111.0979.01-TS

Methodology
The *Highway Safety Manual* (HSM) is a new publication and tool developed by AASHTO to provide a quantitative safety analysis method. Similar to the *Highway Capacity Manual*, the method provides base equations for crash frequency for specific types of corridors based on exposure variables of traffic volume and segment length. This base crash frequency value is then modified by Crash Modification Factors (CMFs) that have been determined through summary of safety research to increase or decrease crash frequency. Finally, the method provides a total summary of predicted annual Crash Frequency and breakdown of predicted Crash Severity between Property Damage Only (PDO) crashes and Fatal or Injury crashes.

Design Criteria and HSM Inputs – Relationship to "Method Defaults"
The HSM provides separate chapters, methodology and input needs for Urban and Suburban Roadways, Rural 2-lane Roadways and Rural Multi-lane Roadways. The Rural Multilane Roadways require the criteria listed below. Also displayed are the HSM default values indicating where the proposed US 63 would be below, meet or exceed those values.

Table 1 – HSM Model and US 63 Roadway Criteria

Variable	Unit	Default	Proposed US 63
Area Type	--	--	Rural
Traffic volume (AADT)	Vpd	--	Varies
Length of Segment	Miles	--	Varies
# Through Lanes	#	--	4
Lane Width	ft	12 ft	12 ft
Shoulder Width (Right)	ft	30 ft	Paved
Shoulder Type	--	Paved	Composite - 2' Paved + 6' Gravel
Presence of Median	--	Yes	Yes
Median Width	ft	30 ft	82 ft (Use 80 ft)
Presence of Median Barrier	--	No	No
Roadside Slope	--	1:7	1:6

Segmentation
The segmentation selected for the corridor was based on logical major changes in corridor volume. These locations are also proposed as full access interchanges, typically at City bypasses. They were:

1. Oskaloosa to New Sharon
2. New Sharon to Montezuma
3. Montezuma to I-80
4. I-80 to US 6 connection north of Malcom

There are a number of low volume intersections that could be included throughout the corridor as HSM "Intersection" locations to calculate crash frequencies. However, as nearly all of the at grade intersections are (a) of such low conflicting volumes that the HSM predicts them to have fewer than one crash per and (b) expected to cross both the west and east alternatives. Therefore, these intersection would result in no to little net 'difference' between two corridor alternatives, and therefore are not included.

Similarly, the higher volume intersections are projected to be interchanges on the Alternative US 63 Corridors. Interchanges are not yet included in the HSM Methodology, but a method is under research for future inclusion.[1] Even if that method were available, the similarity of interchanges between alternatives would – as with the minor intersections described above – result in little difference between alternatives, and therefore are not included in crash comparisons.

Predictive Crash Results
Based on the criteria and methodology described above, the HSM Chapter 11 Rural Multilane Roadways analysis results in a predictive crash rate of 36 cr/year at 2040 traffic volumes for the west alternative, and 35 cr/year at 2040 traffic volumes for the east alternative. A more detailed breakdown is provided in Table 2.

Table 2 – Year 2040 Predictive Crash Alternatives

US 63 Corridor – IA 163 to US 6	Crash Frequency – (Crashes/Year)	Crash Severity	
		Property Damage Only (PDO)	Fatal or Injury
West Alternative	36	20	16
East Alternative	35	19	16

According to the HSM Chapter 11, for a rural multilane highway the predominant crash types would be single vehicle (run off road, etc – 76%) and rear end (11%), with rare occurrences of head-on, sideswipe or angle crashes.

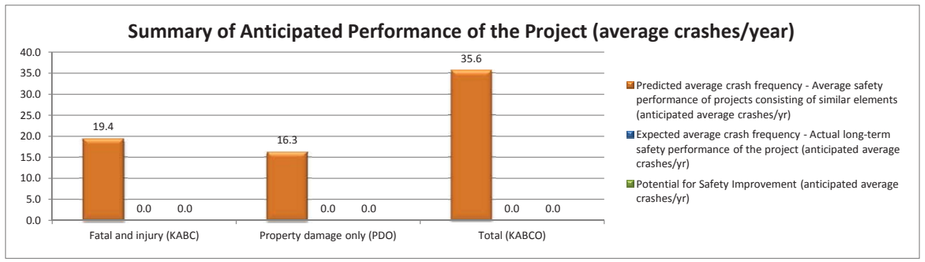
The conclusion drawn from the analysis is that the two improved bypass alternatives will have little difference in predictive safety. Both alternatives will vary in little besides distance, otherwise sharing design criteria and access control. However, both alternatives will have a superior safety record compared to the "no build" existing roadway, primarily due to the bypass of Oskaloosa. As discussed in the report, the current Oskaloosa corridor experiences approximately 40 crashes per year, with a crash rate of 348 cr/HMVM crashes, higher than statewide average crash rate for Municipal Primary highways of 290 cr/HMVM.

[1] http://apps.trb.org/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=2512

PROJECT SAFETY PERFORMANCE SUMMARY REPORT

General Information	
Project Name	US 63 Corridor Study
Project Description	US 63 West Alignment
Reference Number	111.0979
Analyst	GEK
Agency/Company	Snyder & Associates, Inc
Contact Email	0
Contact Phone	-
Date Completed	04/05/13

PROJECT SUMMARY



Project Element	Total Crashes/yr (KABCO)			Fatal and Injury Crashes/yr (KABC)			Property Damage Only Crashes/yr (PDO)		
	Predicted average crash frequency $N_{predicted\ (KABCO)}$	Expected average crash frequency $N_{expected\ (KABCO)}$	Potential for Improvement	Predicted average crash frequency $N_{predicted\ (KABC)}$	Expected average crash frequency $N_{expected\ (KABC)}$	Potential for Improvement	Predicted average crash frequency $N_{predicted\ (O)}$	Expected average crash frequency $N_{expected\ (O)}$	Potential for Improvement
INDIVIDUAL SEGMENTS									
Segment 1	10.4	0.0	0.0	5.7	0.0	0.0	4.7	0.0	0.0
Segment 2	8.4	0.0	0.0	4.7	0.0	0.0	3.8	0.0	0.0
Segment 3	10.7	0.0	0.0	5.8	0.0	0.0	4.9	0.0	0.0
Segment 4	5.3	0.0	0.0	2.9	0.0	0.0	2.4	0.0	0.0
INDIVIDUAL INTERSECTIONS									
Intersection 1	0.8	0.0	0.0	0.3	0.0	0.0	0.5	0.0	0.0
COMBINED (sum of column)	35.6	0.0	0.0	19.4	0.0	0.0	16.3	0.0	0.0

PROJECT SUMMARY -- Site-Specific EB Method Summary Results for Rural Multilane Roads

Crash severity level	$N_{predicted(PROJECT)}$ Predicted average crash frequency - Average safety performance of projects consisting of similar elements (anticipated average crashes/yr)	$N_{expected\ (PROJECT)}$ Expected average crash frequency - Actual long-term safety performance of the project (anticipated average crashes/yr)	$N_{potential\ for\ improvement\ (PROJECT)}$ Potential for Safety Improvement (anticipated average crashes/yr)
Fatal and injury (KABC)	19.4	0.0	N/A
Property damage only (PDO)	16.3	0.0	N/A
Total (KABCO)	35.6	0.0	N/A

Discussion of Results

Given the potential effects of project characteristics on safety performance, results indicate that:

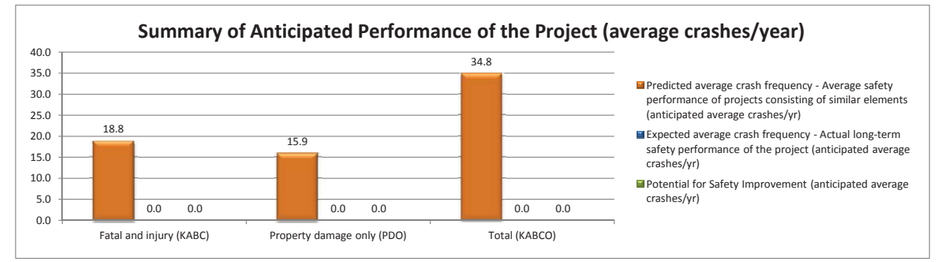
1. It is anticipated that the project will, on average, experience 0 crashes per year (0 fatal and injury crashes per year; and 0 property damage only crashes per year).

2. A similar project is anticipated, on average, to experience 35.6 crashes per year (19.4 fatal and injury crashes per year; and 16.3 property damage only crashes per year).

PROJECT SAFETY PERFORMANCE SUMMARY REPORT

General Information	
Project Name	US 63 Corridor Study
Project Description	US 63 East Alignment
Reference Number	111.0979
Analyst	GEK
Agency/Company	Snyder & Associates, Inc
Contact Email	0
Contact Phone	-
Date Completed	04/05/13

PROJECT SUMMARY



Project Element	Total Crashes/yr (KABCO)			Fatal and Injury Crashes/yr (KABC)			Property Damage Only Crashes/yr (PDO)		
	Predicted average crash frequency $N_{predicted\ (KABCO)}$	Expected average crash frequency $N_{expected\ (KABCO)}$	Potential for Improvement	Predicted average crash frequency $N_{predicted\ (KABC)}$	Expected average crash frequency $N_{expected\ (KABC)}$	Potential for Improvement	Predicted average crash frequency $N_{predicted\ (O)}$	Expected average crash frequency $N_{expected\ (O)}$	Potential for Improvement
INDIVIDUAL SEGMENTS									
Segment 1	10.8	0.0	0.0	5.9	0.0	0.0	4.9	0.0	0.0
Segment 2	7.6	0.0	0.0	4.2	0.0	0.0	3.4	0.0	0.0
Segment 3	10.3	0.0	0.0	5.5	0.0	0.0	4.7	0.0	0.0
Segment 4	5.3	0.0	0.0	2.9	0.0	0.0	2.4	0.0	0.0
INDIVIDUAL INTERSECTIONS									
Intersection 1	0.8	0.0	0.0	0.3	0.0	0.0	0.5	0.0	0.0
COMBINED (sum of column)	34.8	0.0	0.0	18.8	0.0	0.0	15.9	0.0	0.0

PROJECT SUMMARY -- Site-Specific EB Method Summary Results for Rural Multilane Roads

Crash severity level	$N_{predicted(PROJECT)}$ Predicted average crash frequency - Average safety performance of projects consisting of similar elements (anticipated average crashes/yr)	$N_{expected\ (PROJECT)}$ Expected average crash frequency - Actual long-term safety performance of the project (anticipated average crashes/yr)	$N_{potential\ for\ improvement\ (PROJECT)}$ Potential for Safety Improvement (anticipated average crashes/yr)
Fatal and injury (KABC)	18.8	0.0	N/A
Property damage only (PDO)	15.9	0.0	N/A
Total (KABCO)	34.8	0.0	N/A

Discussion of Results

Given the potential effects of project characteristics on safety performance, results indicate that:

1. It is anticipated that the project will, on average, experience 0 crashes per year (0 fatal and injury crashes per year; and 0 property damage only crashes per year).

2. A similar project is anticipated, on average, to experience 34.8 crashes per year (18.8 fatal and injury crashes per year; and 15.9 property damage only crashes per year).

U.S. HIGHWAY 63 CORRIDOR STUDY, MAHASKA AND POWESHIEK COUNTIES, IOWA:
Historical/Architectural Reconnaissance Study

IDOT Project No. STP-S-CO62(78)--5E-62

Snyder & Associates Project No. 111.0979.01

Tallgrass Historians Report No. TH12-556--2

HADB No. 00-273

Submitted to

Snyder and Associates, Inc.
2727 SW Snyder Blvd.
P.O. Box 1159
Ankeny, IA 50023

Submitted by

Tallgrass Historians L.C.
Leah D. Rogers, Principal Investigator and
Jennifer A. Price, Research Associate
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Iowa City, Iowa 52246

November 2012

Abstract

The architectural/historical reconnaissance study for the proposed U.S. Highway 63 Corridor Study in Mahaska and Poweshiek Counties, Iowa examined a study area that encompasses approximately 124,538 ac (50,438 ha). This area includes three potential road corridors and buffer areas around and in-between those corridors for planning purposes. The study area extends from the west side of Oskaloosa in Mahaska County to around U.S. Highway 6 just north of Malcom in Poweshiek County. Other towns within the overall study area include Montezuma and New Sharon.

The study identified six properties within the study area that had been previously listed in the National Register of Historic Places. These include the following:

North Skunk River Bridge	Co. Rd. G13 over North Skunk River	New Sharon vicinity
Stock Judging Pavilion	Southern Iowa Fairgrounds	Oskaloosa
McDowell Bridge	River Rd. over North Skunk River	Montezuma vicinity
New Carroll House Hotel	E. Main and 5th Sts.	Montezuma
Poweshiek County Courthouse	Town Square	Montezuma
Raymond P.P. House	4th Street	Malcom

In addition, the study noted two properties in the Poweshiek County portion of the study area and vicinity that had been previously identified as eligible for the National Register as well as 16 properties that appear to be potentially eligible for their architectural and/or historical significance. These include rural farm properties (farmsteads, houses, and/or barns), a telephone relay station, the townsites of Ewart and Forest Home, and at least one rural church.

In Mahaska County, the study noted 24 properties that appear to be potentially eligible for their architectural and/or historical significance within or very near the current study area. In addition, two properties just outside of the current study area had been previously determined eligible for the National Register. The noted properties include rural farm properties (farmsteads, houses, and/or barns), a bridge, a rural school, and the townsites of Lacey and Evans (the latter is just outside of current study area).

Also, within the city limits of Oskaloosa in the current study area there are five potentially eligible properties identified. These consist of a house, a farmstead, two barns, and a possible fairgrounds building.

The already-determined eligible properties and the properties already listed in the National Register of Historic Places would be recommended for avoidance from impacts by the proposed highway construction project. The potentially eligible properties would require intensive survey and evaluation in order to make a final determination of eligibility. If found eligible, they would also be recommended for avoidance.

It should be noted that the selected project corridors will require Intensive Survey and Evaluation for historical/architectural properties of all properties 50 years of age or older and may result in additional properties (not identified in the current study) being found eligible for the National Register of Historic Places for historical and/or architectural significance.

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Appendix B: List of Previously Inventoried Architectural/Historical Properties in U.S. 63 Corridor Study Area & Vicinity. . 37

Introduction

This architectural/historical reconnaissance study was undertaken for the proposed U.S. Highway 63 Corridor Study in Mahaska and Poweshiek Counties, Iowa (Figures 1-3). It was conducted for Snyder and Associates, Inc, of Ankeny, Iowa, by Tallgrass Historians L.C. of Iowa City. The study area encompasses approximately 124,538 ac (50,438 ha), an area that includes three potential road corridors and buffer areas around and in-between those corridors for planning purposes (see Figures 2-3). The study area extends from the west side of Oskaloosa in Mahaska County to around U.S. Highway 6 just north of Malcom in Poweshiek County (see Figures 2-3). Other towns within the overall study area include Montezuma and New Sharon. A Phase IA Archaeological Assessment was also undertaken for this project, with the results of that study reported in Rogers et al. (2012).

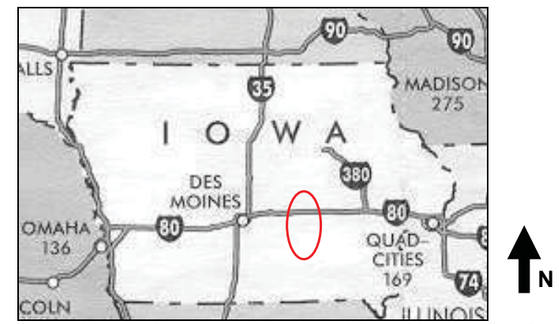


Figure 1. General Project Location—Mahaska and Poweshiek Counties, Iowa
(taken from Iowa Transportation Map *roadmap, 2002)*

Reconnaissance studies are conducted as early planning tools and are intended to inform about the architectural resources and history of the study area. Reconnaissance studies can identify properties with obvious architectural significance under National Register of Historic Places guidelines. Properties can also be identified as having some potential for architectural and/or historical significance at the reconnaissance level but would require intensive survey and evaluation in order to make a determination of eligibility. Additionally, properties with likely historical significance sometimes can be identified based on the knowledge and experience of the investigator. Historical significance must be confirmed through additional research at the intensive level of investigation.

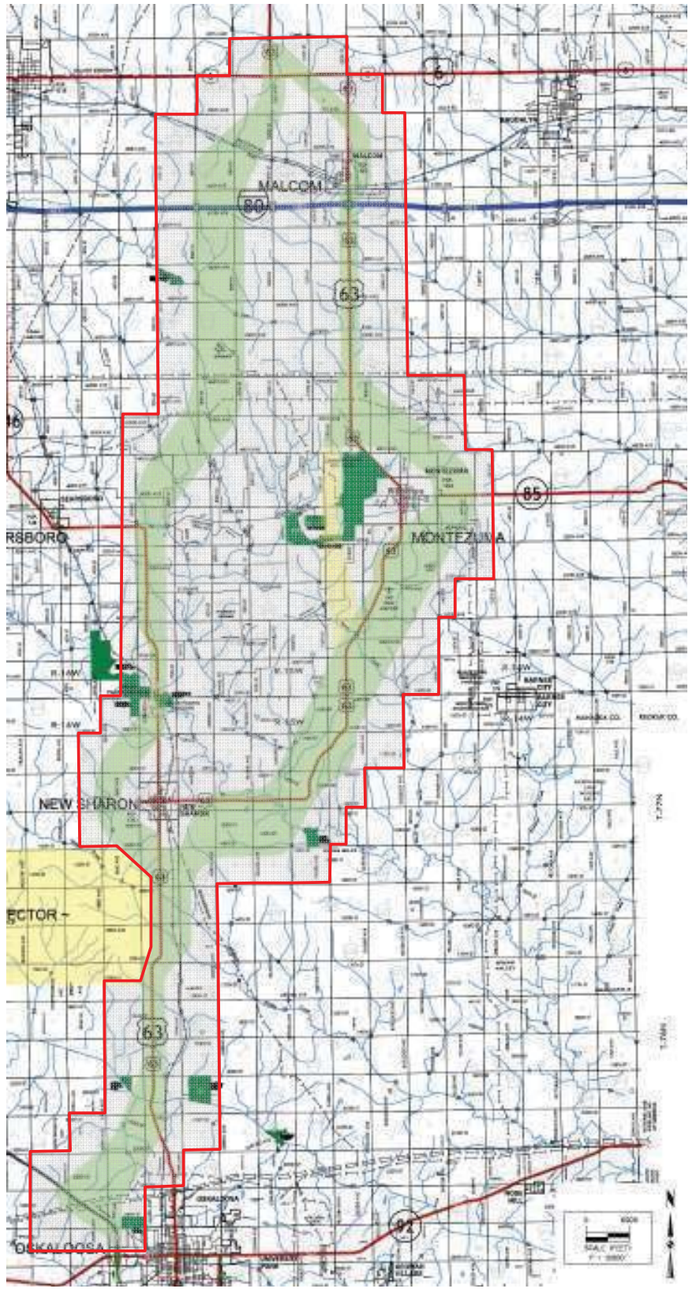


Figure 2. Current study area (red outline) for U.S. Highway 63 Corridor Study
(base map provided by Snyder & Associates, Inc., Ankeny, Iowa,
with study area overlay added by Tallgrass Historians L.C., Iowa City)

2

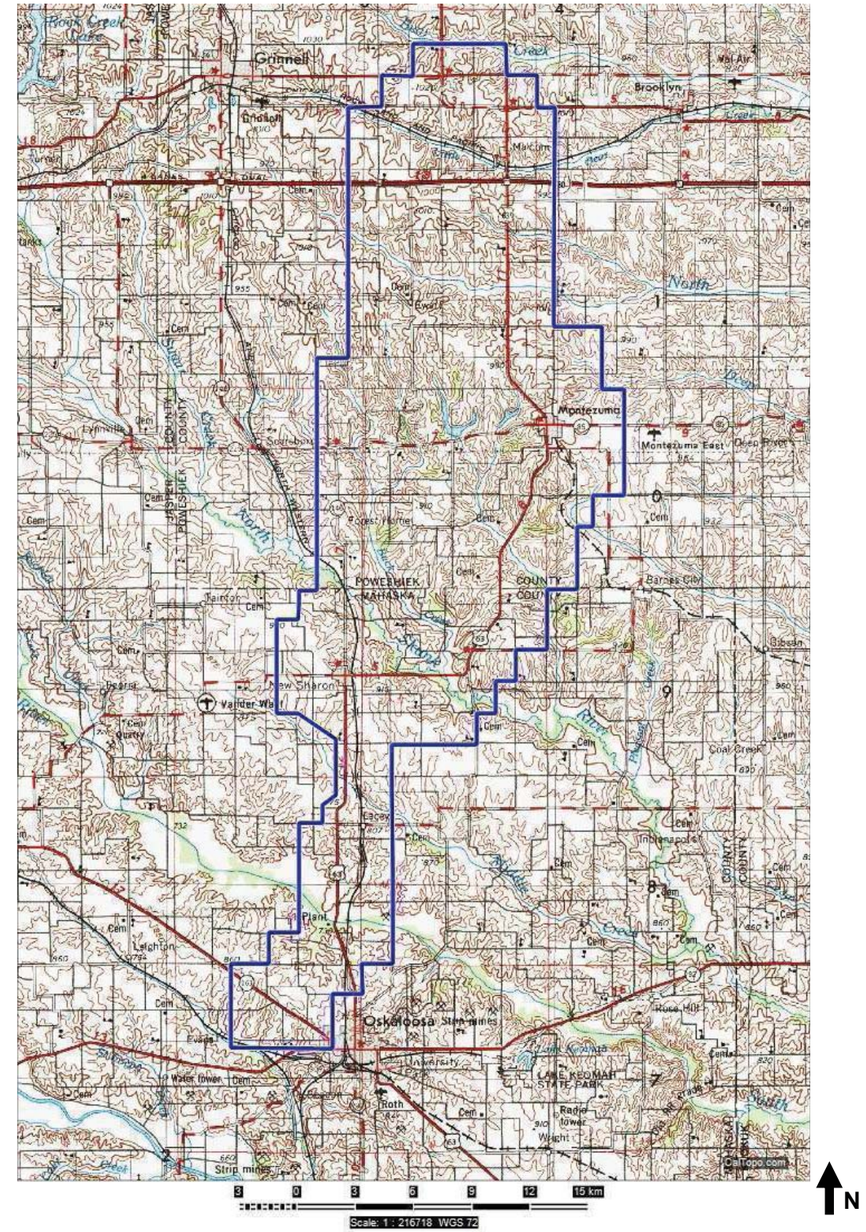


Figure 3. Topographic location of current study area (blue outline)
for U.S. Highway 63 Corridor Study. *(Map obtained from* ExpertGPS mapping software, 2012)

3

Methods and Sources

The reconnaissance study included research into the overall history of the study area as it relates to the architectural/historical properties of this area. Archival resources examined were primarily secondary sources obtained from online historical databases and State Historical Society of Iowa and National Register of Historic Places databases. Historical themes pertinent to the development of the study area were identified. These themes will require more intensive research in order to compile the applicable historic contexts in which to evaluate National Register eligibility of architectural/historical properties in the intensive survey and evaluation stage of the project.

The available Mahaska and Poweshiek county Assessor's real estate records were then examined online in order to initially identify properties having some potential architectural significance within the study area. To further examine potential properties, a windshield survey was conducted of the study area by Research Associate, Jennifer A. Price, to identify additional properties and to check on properties identified through the Assessor's records.

Based on these data, initial tables and maps of known or potential National Register-eligible properties were compiled. The project summary report was compiled by the Principal Investigator, Leah D. Rogers, of Tallgrass Historians L.C., Iowa City, and the Research Associate, Jennifer A. Price. A HADB form was completed for this report and is included in Appendix A.

Historical Themes

Historical themes that may figure in the evaluation of historic resources in Poweshiek and Mahaska counties include: Political Organization, Settlement, and Community Development; Agriculture; Transportation; Coal Mining; and Religious and Ethnic Settlement.

Political Organization, Settlement, and Community Development

The history of the Political Organization, Settlement, and Community Development of both Poweshiek and Mahaska counties will figure in the evaluation of historic resources in the U.S. Highway 63 study area. The two counties share similar histories, with the territory of Poweshiek County having once been part of a larger Mahaska County (Parker 1911:84). Settlement of the area began in the early 1840s, and both counties were established and organized into townships by 1848. The study area includes land in six townships in south-central Poweshiek County and six townships in north-central Mahaska County. Both of these counties are mainly rural with economies centered on agriculture. Townships within the study area in Poweshiek County include: Malcolm, Pleasant, Union, Jackson, Sugar Creek, and Scott. Townships within the study area in Mahaska County include: Lincoln, Garfield, Madison, Prairie, Adams, and Union.

Each county contains one urban center (i.e., Grinnell in Poweshiek and Oskaloosa in Mahaska), several smaller market and banking towns, and a number of extant or former post or railroad villages. The study area excludes Grinnell, but skirts the northwestern corporate limits of Oskaloosa (the county seat), an area just west and south of the Southern Iowa Fairgrounds.

Resources in this area include a possible former fairgrounds building, early 20th-century suburban houses, a full farmstead, and at least two historic barns, all of which are now part of the expanding Oskaloosa metro area. This area's proximity to the fairgrounds will make the history of Oskaloosa's planning and development important in evaluating extant historic resources. The smaller towns like Malcolm and Montezuma (the county seat) in Poweshiek, and New Sharon in Mahaska, functioned as market and banking centers as well as political and social centers for surrounding farmers, and will likely be important in evaluating surrounding historic resources.

Older post villages situated on once important county and township roads within the study area include: Forest Home and Brownsville in Poweshiek County, and Farmersville and Union Mills in Mahaska County. Besides cemeteries, however, these pre-railroad townsites appear to contain very little in standing historic architectural resources. In contrast, the formerly important railroad shipping points of Ewart in Poweshiek County and Lacey in Mahaska County, both of which are in the study area, appear to contain extant historic resources (DeWitt 1950). Ewart was laid out in 1875 on the line of the Grinnell and Montezuma Railroad (later the Central Iowa Railway) by the Ewart Bros., successful livestock farmers of Pleasant Township (Union Historical 1880:632). The town of Lacey was organized in 1878 around the depot of the Central Iowa Railway. John Lacey, the eight-term Congressman from Oskaloosa, gave the land for the railroad and, with Jerry Everett, laid out the town. Both Ewart and Lacey were important shipping points before the development of highways and the rise of the trucking industry (DeWitt 1950; Ewart Story 2012).

Extant historic resources that reflect the historic themes of Settlement and Community Planning and Development remain part of the rural landscape of these two counties. Property types associated with these themes include several examples of rural one-room schoolhouses, a number of which have been relocated; others have been converted to residences. One example, the East Center Schoolhouse, was moved to the Nelson Pioneer Farmstead (NRHP-Listed), northeast of Oskaloosa and just outside of the current study area. The study area also includes two examples of rural churches and more than 20 rural cemeteries, all reflecting the history of the surrounding farming communities.

Figure 4. Schoolhouse, 2358 Kirby, Mahaska County, view NE. Photo by Tallgrass Historians L.C., July 2012

Figure 5. 1867 West Liberty Church of Christ, Diamond Trail Rd and 500th Ave, Sugar Creek Twp, Poweshiek County, view SW. Photo by Tallgrass Historians L.C., July 2012

Agriculture in South-Central Iowa

Both Poweshiek and Mahaska counties are located in the Eastern Livestock Region, one of three areas in the state in which farmers specialized in raising livestock (i.e., cattle and hogs) for meat production. Unlike farms in the north-central cash-grain region, farms in the eastern livestock region have larger amounts of untillable pastureland best suited for raising hay and forage crops. Livestock farmsteads involve more complex activities than grain or dairy farming, and thus tend to be larger and have more buildings (Soike 1989:157-8).

Figure 6. Historic gambrel-roof barn on otherwise modern farmstead, 3914 Hwy 63, just north of Malcolm, view SW. Photo by Tallgrass Historians L.C., September 2012

Figure 7. Farmstead, 1436 Hwy 63, just south of New Sharon, Mahaska County, with Craftsman farmhouse and Three-Portal Barn. View NW. Photo by Tallgrass Historians L.C., September 2012

Farmsteads in the study area reflect the history of agricultural development, from the diversified general farms of the latter half of the nineteenth century to the more specialized livestock farms of the early to mid-twentieth century. Farmhouses built in simple folk forms are scattered throughout the study area, and include: L-shaped, Front-Gabled, Side-gabled, and Four-Square houses, some with stylish architectural details. Others display a wide range of stylish architectural trends, such as Greek Revival, Italianate, Queen Anne, Neoclassical-style, Colonial Revival, Craftsman, and Prairie style. The variety of domestic architecture extends throughout the study area encompassing both the rural and the more urbanized areas. Barns vary in style throughout the study area as well, reflecting older general farming activities as well as newer specializations. Barns within the study area include: older examples of side-gabled and banked barns, three-portal livestock barns, gambrel roof barns with tile-block foundations, monitor-roof barns, and even one octagon barn.

A number of full farmsteads containing historic houses with historic barns are within the study area, although the numbers of these full farmsteads appear to be dwindling rapidly. Consolidation of farmland into large-scale corporate farming operations over the past half-century has left the rural landscape of both Poweshiek and Mahaska counties dotted with many remnants of formerly self-sufficient family-owned farmsteads. This trend is most apparent near the Interstate 80 highway corridor near Malcolm in Poweshiek County. These remnant farmsteads may contain historic farmhouses with no barns or other supporting farm buildings, or farmhouses surrounded with modern prefabricated metal storage buildings. Other remnant farmsteads feature historic barns paired with modern suburban houses or manufactured homes.

Some farmsteads established decades ago on the periphery of larger towns like Oskaloosa, New Sharon, and Montezuma, are now within the limits of expanding urban fringes. These once rural properties are somewhat at odds with new development. At least two historic barns on the northwestern edge of Oskaloosa have been converted to commercial use.

Figure 8. Farmstead, 3845 Hwy 63, Malcolm, with settlement-era farmhouse (left) and newer, updated barn. View NE. Photo by Tallgrass Historians L.C., September 2012

Figure 9. Farmstead with octagon barn, 1574 Hwy 85, Montezuma, view SW.
Photo by Tallgrass Historians L.C., September 2012

Figure 10. View west of farmstead at 4956 Hwy 63, on the southern fringe of Montezuma. The photo was taken from the parking lot of the new Montezuma Police Station. Photo by Tallgrass Historians L.C., September 2012

Transportation

Railroads

Several railroads played major roles in the settlement, growth, and development of Poweshiek and Mahaska counties. Railroads that operated within the study area included the Chicago, Rock Island & Pacific Railroad and the Iowa Central Railway, which operated from Grinnell to Montezuma to Oskaloosa. Today, the BNSF Railway is the only railroad operating within the study area.[1] Older post villages thrived as social and market centers in township-based farming communities but they slowly died when the railroads channeled most economic activities into the towns and urban centers along their routes. At the same time, railroads created opportunities for new towns to thrive. The remnants of two such railroad-born towns are located within the study area: the Town of Ewart in Pleasant Township, Poweshiek County, and the Town of Lacey on the Madison-Adams Township line in Mahaska County. Both of these railroad towns were established by prominent individuals in each county's history.

Ewart was laid out by the Ewart Brothers (successful livestock farmers in Pleasant Township) along the line of the Grinnell and Montezuma Railroad (later the Iowa Central Railway) in 1875. Lacey was platted by John F. Lacey, the eight-term U.S. Representative from Oskaloosa (Ewart Story 2012; DeWitt 1950). Evans, another railroad-born town is located just west of Oskaloosa in Garfield Township on the now abandoned line of the Chicago Rock Island & Pacific Railroad (see Coal Mining section).[2]

Highways

The rising importance of motor vehicles, which parallels the decline of railroads, became apparent during the first decades of the twentieth century, promoted by Good Roads Associations and early efforts of the new State Highway Commission (SHC) to build better roads. Registered routes by private associations and SHC designated county and state primary road systems continued to improve Iowa's road system (IDOT 2012). Two notable registered routes that bisected the study area were the Great White Way (registered in 1914) and the Whiteway-7-Highway (registered in 1922). The Great White Way extended from Davenport to Council Bluffs by way of Oskaloosa in Mahaska County via what are now Iowa Highways 92 and 163. The Whiteway-7-Highway extended from Chicago to Omaha, with the route extending through Malcom in Poweshiek County along what is now U.S. Highway 6 (IDOT 1986).

U.S. Highway 63 was designated on October 16, 1926, from segments of Iowa Highways 2, 24, and 13. The section from U.S. Highway 6 to the Mahaska/Poweshiek county line was not paved until 1938 (Hancock 2011). Historically in the project area, the route of U.S. 63 between Oskaloosa and New Sharon was part of the Glacier Trail, which was registered in 1921 and extended from St. Louis to Glacier National Park (IDOT 1986). U.S. 63 has been an agent of modernization for the rural communities through which it passes, although the changes wrought

[1] The modern BNSF Railway "is the product of nearly 400 different railroad lines that merged or were acquired over the course of 160 years" (http://www.bnsf.com/about-bnsf/our-railroad/, accessed October 2012). Historically, BNSF stood for the Burlington, Northern and Santa Fe Railroad.
[2] Evans is located just outside of the current study area.

by this two-lane highway appear to have been gradual. In contrast, the construction of Interstate 80 through the northern part of the study area seems to be accelerating the modernization of the agricultural landscape around Malcolm, replacing individual farmsteads with agribusiness developments, such as large-scale grain elevators, hog confinements, and poultry operations.

Coal Mining in Mahaska County

From the time of settlement until the early 1900s, coal mining operations directed a large part of the development of Mahaska County. Coal not only attracted capital, but also railroads, which needed reliable coal supplies to run their steam engines. Numerous coal companies and towns came and went. In terms of wealth, population growth, and railroad access, Oskaloosa benefitted most from the Mahaska County coal mining boom. By 1890, the city was served directly by three railroads: the Iowa Central; the Chicago, Rock Island & Pacific (Oskaloosa Branch); and the Burlington & Western. By 1896, the Wabash Railroad became the fourth (Hedge 1906).

Near, but outside of, the study area is the unincorporated Town of Evans, located in section 17 on Muchakinock Creek. In addition to having been a railroad town, Evans was also a coal company town established around 1879 at the junction of the Des Moines Valley and Knoxville Branches of the Chicago Rock Island & Pacific Railroad. The town was first called Knoxville Junction. It was then platted with the name Elida, after the Elida Coal Company, which was the first to begin operations there. When the post office was established the name was changed to Evans, in honor of D.J. Evans, a prominent citizen whose land was among the first to be mined. T.J. Evans was the first postmaster. After the Elida Coal Company, Evans became the center of the operations of the American Coal Company (*Oskaloosa Daily Herald*, 7/3/1950; Hedge 1906; Savage 2007:82).

Religious and Ethnic Settlement

Notable Religious Settlement in Mahaska and Poweshiek Counties

While a number of religious groups settled in the Mahaska/Poweshiek counties study area, two notable groups are worthy of mention as they may be relate to potentially significant cultural resources. Specifically, these groups are the Congregationalists, who concentrated in the Grinnell vicinity, and the Quakers (Society of Friends), who made more dispersed settlements in this area in the mid-nineteenth century. Both groups "were especially active in the abolitionist crusade and in supporting the underground railroad" (Schwieder 2008:8). Their participation in the Underground Railroad in the two-county area may be associated with historic sites (archaeological and/or architectural) yet to be identified in the study area.

The State Historical Society of Iowa (SHSI) has been conducting a historical study of the Underground Railroad (UGRR) in Iowa's history including an inventory of known or potential sites and persons associated with anti-slavery activities in the state. The following is a preliminary list of the inventories from Mahaska and Poweshiek counties provided by Douglas Jones of the SHSI:

Mahaska County Abolitionists
Baugh, George (Oskaloosa)

Howard, Henry (Oskaloosa)
Hunter, William A. (Oskaloosa Township)
McAyael, Rev. Robert A. (Oskaloosa, Presbyterian)
Morgan, David ? (Oskaloosa Township)
Rogers, Alexander M. (Oskaloosa, Presbyterian)
Scott, Silas (Oskaloosa Township)
Williams, Andrew C. (Oskaloosa Township)
Williams, John C. (Oskaloosa)
Young, J. E. (Oskaloosa)

Mahaska County UGRR Conductors/Station Agents
Boyd, James (Oskaloosa)
Dennis, Rev. L. D, (?)
English, Alpha (Fremont)
Gruwell, Dr. J. P. (Oskaloosa)
Hoag, Joseph D. (Oskaloosa)
Hockett, I. (Fremont)
Jones, Joseph (Oskaloosa)
Kimberly, Rev. William (Indianapolis, Adams Township)
McCormick, Matthew (Fremont Vicinity)
Montgomery, William. (Fremont)
Sopher, William Kenworthy (Oskaloosa Vicinity, Spring Creek Township)
Stanton, Borden (New Sharon)
Stanton, James ? (New Sharon)
Thompson, Judge Samuel (Oskaloosa)

Poweshiek County UGRR Places
S. N. Bartlett House
Brooklyn
Congregational Church (Grinnell)
Grinnell College (Grinnell)
The Reed House (Grinnell)

Poweshiek County Abolitionists
Bixby, Sarah H. (Grinnell)
Conaway, Dr. John (Brooklyn)

Poweshiek County Anti-Abolitionists
Clark, Capt. Nathaniel Winslow (Grinnell)
Cooper, Samuel "Scotch" (Grinnell)

Poweshiek County Freedom Seekers
"Four Black Men" (names unknown)
Craig, George
Overton, Frances
Thompson, Clark
Thompson, Dennis

Poweshiek County UGRR Conductors/Station Agents
Bailey, James F. (Grinnell)
Bixby, Amos (Grinnell)
Bliss, Harvey (Grinnell)
Brande, Elder T. (Grinnell)
Cooper, Samuel F. (Grinnell)
Grinnell, Josiah B. (Grinnell)
Griffith, Isaac Newton (Montezuma)
Hamlin, Rev. Homer (Grinnell)
Harris family (Grinnell)
Hill, Gershem H. (Grinnell)
Newkirk, Shipman (Brooklyn)
Parker, Prof. Leonard Fletcher (Grinnell)
Parks, Philo (Grinnell)

The homes, farmsteads, businesses, churches/meetinghouses, schools, and other properties associated with these persons could be significant if the properties or sites retain good integrity or at least good integrity of association with UGRR and other anti-slavery activities. These properties could be archaeological or architectural in nature.

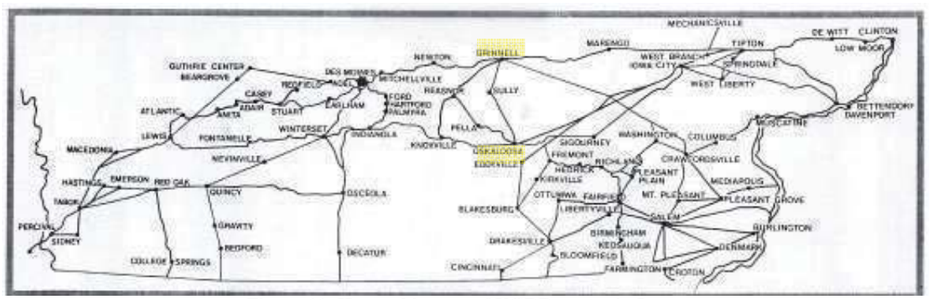


Figure 11. Harnack's map of UGRR routes in Iowa.
Source: Harnack 1956; areas highlighted in yellow in general study area and vicinity.

Figure 12. Siebert's map of UGRR routes in Iowa.
Source: Siebert 1968:113; areas highlighted in yellow in general study area and vicinity.

Ethnic Settlements in Mahaska and Poweshiek Counties

The majority of settlers in the two-county area were American-born and migrated to this area in the mid- to late nineteenth century as part of the general westward movement of population during this period. Most of the earliest settlers hailed from Ohio, Indiana, Pennsylvania, Kentucky, Tennessee, Virginia, New York, Illinois, and various New England states (BRW, Inc. 1990; Parker 1911).

There were some notable ethnic groups represented in the study area vicinity. Some of the large Dutch immigrant settlement in neighboring Marion County (centered on the town of Pella) extended into northwestern Mahaska County in the nineteenth century. The coal mines in Mahaska County also employed foreign immigrants, most notably Welsh miners. Additionally, some of the coal mines in the county employed African Americans (BRW, Inc. 1990). The mining town of Muchakinock in Harrison Township in southern Mahaska County was populated by African American miners in the late nineteenth century. Southwest of Oskaloosa just over the county line in Monroe County was the coal mining town of Buxton, which was largely an African American mining town in the early twentieth century (Gradwohl and Osborn 1990).[3]

Many of the region's underground coal mines were surface or strip mined in the twentieth century. However, some historic features such as shaft openings and surface structures and/or features once associated with the historic mining operations could remain.

[3] In fact, the mine at Buxton was established by the same company that founded Muchakinock and represented the moving of that company from one mine to the next after the first (at Muchakinock) had played out (BRW, Inc. 1990).

Findings

Properties Already Listed in the National Register of Historic Places

The following is a list of those properties, buildings and structures, in Poweshiek and Mahaska counties (in their totality) that have been listed in the National Register of Historic Places:[4]

Poweshiek County

Property	Address	City	Date Listed
Bowers and McDonald Office Building	816 Commercial Street	Grinnell	12/20/1990
Brooklyn Hotel	154 Front Street	Brooklyn	10/01/1979
Chicago Rock Island and Pacific Railroad-Grinnell Passenger Station	Park and State Sts.	Grinnell	12/12/1976
Goodnow Hall	Grinnell College campus	Grinnell	04/26/1979
Grinnell Herald Building	813 5th Ave.	Grinnell	01/17/1991
Grinnell Historic Commercial District	Roughly bounded by Main Broad and Commercial Sts. and 5th Ave.	Grinnell	04/09/1991
Grinnell Levi P. House	1002 Park Street	Grinnell	10/01/1979
Interior Telephone Company Building	815 5th Ave.	Grinnell	12/20/1990
Kent Union Chapel and Cemetery	3386 V18 Rd.	Brooklyn vicinity	09/16/2009
Manatt William House	306 Jackson Street	Brooklyn	10/30/1997
Marsh E.A. and Rebecca (Johnson) House	833 East St.	Grinnell	4/15/1999
McDowell Bridge	River Rd. over North Skunk River	Montezuma vicinity	5/15/1998
Mears Hall	Grinnell College campus	Grinnell	04/26/1979
Merchants' National Bank	NW corner 4th Ave. and Broad Street	Grinnell	01/07/1976
New Carroll House Hotel	E. Main and 5th Sts.	Montezuma	10/01/1979
North Grinnell Historic District	Park to W., 6th Ave. to 11th Ave.	Grinnell	12/10/2008
Poweshiek County Courthouse	Town Square	Montezuma	07/02/1981
Raymond P.P. House	4th Street	Malcom	04/24/1985
Ricker B.J. House	1510 Broad Street	Grinnell	12/25/1979
Spaulding Manufacturing Company 500--610 4th Ave.	827--829 Spring Street	Grinnell	12/21/1978
Spencer Charles H. House	611 6th Ave.	Grinnell	01/25/1980
Stewart Library	926 Broad Street	Grinnell	11/21/1976

Mahaska County

Property	Address	City	Date Listed
Bellefountain Bridge	Ashland Ave. over Des Moines River	Tracy vicinity	5/15/1998
Eveland Bridge	Fulton Ave. over Des Moines River	Oskaloosa vicinity	5/15/1998
North Skunk River Bridge	Co. Rd. G13 over North Skunk River	New Sharon vicinity	5/15/1998
Alsop Carroll House	1907 A Avenue East	Oskaloosa	11/09/1988
Dr. William E. and Ethel Rosenberger House	116 Rosenberger Ave.	Oskaloosa	03/29/1996
Conover Thomas J. House	1010 N. Market Street	Oskaloosa	03/28/1996
Edmundson Park Historic District	Jct. of 11th Ave. W and Edmundson Dr.	Oskaloosa	9/27/2007
Forest Cemetery Entrance	Jct. of N. 9th Street and J Ave. E.	Oskaloosa	12/13/1991

[4] Yellow highlighted properties are within the current study area.

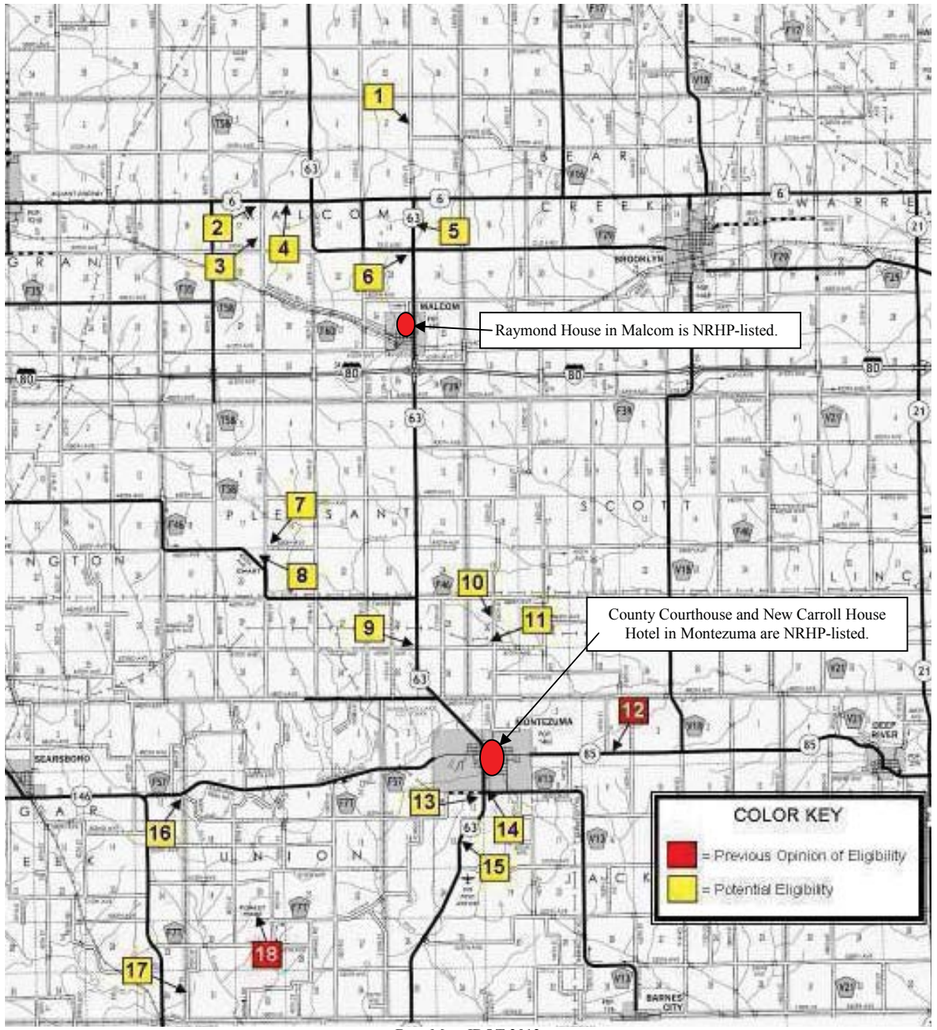
Gibbs E. H. House	William Penn College Campus N. Market Ext.	Oskaloosa	12/13/1991
Hoffman Phil House	807 High Ave. E.	Oskaloosa	12/13/1991
Iowa Yearly Meeting House--College Avenue Friends Church	912 N. C Street	Oskaloosa	03/29/1996
Johnson William A. and Ida C. House	307 College Ave.	Oskaloosa	03/28/1996
Klose Dr. William H. and Mae R. House	1002 Penn Blvd.	Oskaloosa	03/29/1996
Lake Keomah State Park Bathhouse--Lodge Area (Area A)	Off IA 371 S of jct. with IA 92	Oskaloosa	11/15/1990
Lake Keomah State Park Erosion Control Area (Area B)	Off IA 371 S of jct. with IA 92	Oskaloosa	11/15/1990
Lamberson Jack House	511 N. Park Ave.	Oskaloosa	11/09/1988
Lincoln School	911 B Ave. W.	Oskaloosa	12/13/1991
Mahaska County Courthouse	Market Street and 2nd Ave.	Oskaloosa	07/02/1981
McMullin Maj. James W. House	403 1st Ave. E.	Oskaloosa	04/11/1985
McNeill, W.A., House	1282 C Ave. E.	Oskaloosa	10/21/1999
Nelson Daniel House and Barn	SR 1	Oskaloosa	11/20/1974
Oskaloosa City Hall	Jct. S. Market Street and 2nd Ave. E. NE corner	Oskaloosa	12/13/1991
Oskaloosa City Park and Band Stand	City Park	Oskaloosa	07/28/1983
Oskaloosa City Square Commercial Historic District	Roughly bounded by A Ave. E N. and S. Second Street Second Ave. E and N. and S. A Street	Oskaloosa	04/10/1986
Oskaloosa Fire Station	109--111 2nd Ave. E.	Oskaloosa	12/13/1991
Oskaloosa Monthly Meeting of Friends Parsonage	910 N. C Street	Oskaloosa	03/29/1996
Oskaloosa Public Library	Jct. of Market Street and 2nd Ave. W. SW corner	Oskaloosa	12/13/1991
Paradise Block Historic District	High Ave. E.	Oskaloosa	12/13/1991
Penn College Historic District	201 Trueblood Ave.	Oskaloosa	04/04/1996
Pierson--Betts House	815 Penn Blvd.	Oskaloosa	03/28/1996
President's Cottage	425 College Ave.	Oskaloosa	03/28/1996
Rock Island Passenger Depot	Rock Island Ave. between 1st and 2nd Sts.	Oskaloosa	10/30/1989
Seeberger-Loring-Kilburn House	509 High Ave. E.	Oskaloosa	07/14/1983
Shoemake John H. House	116 2nd Ave. W.	Oskaloosa	03/22/1984
Smith-Johnson House	713 High Ave. E.	Oskaloosa	11/09/1977
Spring Creek Friends Cemetery	Jct. of Osburn Ave. and 235th Street	Oskaloosa	03/29/1996
Spring Creek Meeting House	207 N. H Street	Oskaloosa	03/28/1996
Spurgin Residence	313 College Ave.	Oskaloosa	03/28/1996
St. James Episcopal Church	Jct. of 1st Ave. and S. 3rd Street SW corner	Oskaloosa	12/13/199
Stock Judging Pavilion Southern	Iowa Fairgrounds	Oskaloosa	04/12/1984
Stokes Dr. Ella House	416 W. College Hill Ave.	Oskaloosa	03/29/1996
Stranahan Prof. Edgar H. and Irene D. House	1001 Gurney Street	Oskaloosa	03/28/1996
Ulysses Simpson Grant Elementary School	715 B Ave. E.	Oskaloosa	12/10/2008
Vandfer Wilt Farmstead Historic District	1345 IA 163, Black Oak Twp, Sec 22, T26N, R17W, SW of NE quarter	Leighton	01/08/2004
Voorhees John K. House	NW of Oskaloosa on IA 163	Oskaloosa	03/05/1982

Of these properties, two located in rural Mahaska County, are within or very near the current study area boundaries and include the North Skunk River Bridge and the Daniel Nelson House and Barn (now the Nelson Pioneer Farm Museum).[5] The other properties listed in the National Register within the current study area include those located in the town limits of Malcom and

[5] The latter is actually located just outside of the current study area but is noted because of its proximity to the study area.

Montezuma. One listed property within the city limits of Oskaloosa is within the current study area. This property is the Stock Judging Pavilion at the fairgrounds.

POWESHIEK COUNTY FINDINGS MAP



Base Map: IDOT 2012

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KEY TO POWESHIEK COUNTY FINDINGS MAP

MAP NO.	PHOTO	PROPERTY NAME/TYPE	LOCATION	DESCRIPTION	FINDING
1		Farmstead	3648 120th St Malcolm Twp 80-15 Sec 2 SE NE & NE SE	1-story Neo-Classical cottage with barn. E.C. Heischman owner on 1896 County Atlas.	Potentially eligible
2		Farmstead	886 Hwy 6 Malcolm Twp 80-15 Sec 17 NE NE	1948 asymmetrical Prairie-style house with 1900 barn. This house is not visible from road.	Potentially eligible
3		Farmstead	879 390th Ave Malcolm Twp 80-15 Sec 17 SE	1901 Stuccoed 2-story house with barn.	Potentially eligible
4		Farmstead	924 Hwy 6 Malcolm Twp 80-15 Sec 16	Italianate farmhouse with barn C.C. Shultz owner on 1875 Andreas Map of County; also Shultz bio in 1880 Co History.	Potentially eligible

APPENDICES

MAP NO.	PHOTO	PROPERTY NAME/TYPE	LOCATION	DESCRIPTION	FINDING
5		Farmstead	3845 Hwy 63 Malcolm Twp 80-15 Sec 13 SW NW	2-story side-gabled house with barn. Charles Eisele owner on 1896 County Atlas.	Potentially eligible
6		Barn	3914 Hwy 63 Malcolm Twp 80-15 Sec 23 NE NE	Gambrel-roof barn with tile block foundation at prominent corner - Hwy 63 & Old Hwy 6; a similar barn is at 3988 Hwy 63 Sec 23 SE SE, but in lesser condition.	Potentially eligible
7		AT&T Telephone Relay Station	901 450th Ave Pleasant Twp 79-15 Sec 16 SW SW	This is a former AT&T Relay Station, built in 1929 just north of Ewart to house long distance telephone equipment. Today it is a residence. Station shown on Iowa Insurance Service Bureau Map of Ewart, Iowa, 1932.	Potentially eligible
8		Town of Ewart	Railroad & North Sts. Pleasant Twp 79-15 Sec 20 NE NE1/4	Extant buildings and structures in the Town of Ewart include the Ewart Cemetery and Mausoleum, the Ewart Presbyterian Church, built in 1922, and residences.	Potentially eligible

MAP NO.	PHOTO	PROPERTY NAME/TYPE	LOCATION	DESCRIPTION	FINDING
9		Farmstead	1191 470th Ave Pleasant Twp 79-15 Sec 26 SE SE1/4	2-story, L-shaped house with gable-on-hip roof; farmstead includes more than one barn and numerous outbuildings. N.J. Wells is owner on 1914 Atlas.	Potentially eligible
10		Farmstead	4628 135th St Scott Twp 79-14 Sec 30 SE NW1/4	Italianate front-gabled house with barn. Not shown on 1875 Andreas map; Geo A. Webber is owner on 1896 County Atlas.	Potentially eligible
11		Farmstead	4688 135th St Scott Twp 79-14 Sec 30 SE SW1/4	19th-Century 2-story side-gabled house with Barn. Windows look original. Geo. Bradley is owner on 1896 County Atlas.	Potentially eligible
12		Octagon Barn	1574 Hwy 85 Jackson Twp 78-14 Sec 4 SW SE1/4	Octagonal-shaped barn west of Montezuma. F.A. Kilburn owner on 1896 County Atlas. Kilburn bio in 1880 County History.	79-00006 Previous Opinion of Eligibility

MAP NO.	PHOTO	PROPERTY NAME/TYPE	LOCATION	DESCRIPTION	FINDING
13		Farmstead	4956 Hwy 63 Jackson Twp 78-15 Sec 12 NE SE1/4	2-story Side-gabled house with two barns on south edge of Montezuma. S. Johnson is owner on 1875 Andreas Map.	Potentially eligible
14		Farmstead	839 S 3rd St Jackson Twp 78-15 Sec 7 NW NW1/4	2-story Front-gabled house with barn on south edge of Montezuma. David Gordon is owner on 1896 County Atlas. Gordon was an early settler (see bio in 1911 County History page 240).	Potentially eligible
15		Farmstead	5059 Hwy 63 Jackson Twp 78-14 Sec 13 SW NE1/4	Neoclassical house, barns, and other outbuildings. This farmstead straddles U.S. 63. George Harner is owner on 1896 County Atlas.	Potentially eligible
16		West Liberty Church of Christ	Diamond Trl Rd and 500th Ave Sugar Creek Twp 78-16 Sec 12 NE SE1/4	West Liberty Church of Christ located next to West Liberty Cemetery. The church, built in 1867, was constructed using hand hewn native timber on land belonging to Richard Rivers (from West Liberty Church of Christ website)	Potentially eligible

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MAP NO.	PHOTO	PROPERTY NAME/TYPE	LOCATION	DESCRIPTION	FINDING
17		Forest Home Townsite	6 mi S of Montezuma Union Twp 78-15 Sec 29 NE NE1/4	Former townsite (also known as Williamsburg); includes a cemetery, modern park, and at least one historic residence (photograph at left).	79-00009 – Previous Opinion of Eligibility -Consultant 1994
18		Farmstead	5366 70th St Sugar Creek Twp 78-16 Sec 36 NE SE1/4	Four-Square house with Prairie-style details plus historic barn.	Potentially eligible

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MAHASKA COUNTY FINDINGS MAP

Base Map: IDOT 2012

KEY TO MAHASKA COUNTY FINDINGS MAP

MAP NO.	PHOTO	PROPERTY NAME/TYPE	LOCATION	DESCRIPTION	FINDINGS
19		North Skunk River Bridge	1.8 mi NE of New Sharon Union Twp 77-15 Sec 7 NE NW	1920 Pinned Parker Truss (Iowa Site No. 62-00175)	NRHP – Listed 5/15/1998
20		House	1063 Hwy 63 Union Twp 77-15-Sec 2 NE SW	Circa 1852 Greek Revival style house with broken-pediment door surround and side bay window. J.K. Gorsuch is owner on 1875 Andreas map. (1852 is Assessor date).	Potentially eligible
21		Farmstead	1115 Hwy 63 Union Twp 77-15 Sec 11 N ½ NW	1907 Neoclassical style house with barn, called "Vander Linden Farms."	Potentially eligible
22		House	808 Market St Prairie Twp New Sharon	Gothic Revival-style cottage, east edge of New Sharon on south side of US 63.	Potentially eligible
23		House	2275 135th Union Twp 77-15-Sec 19 SW NE	Center gable Folk Victorian house. W.A. Atherton is owner on 1905 County Atlas.	Potentially eligible

MAP NO.	PHOTO	PROPERTY NAME/TYPE	LOCATION	DESCRIPTION	FINDINGS
24		House	2349 135th Union Twp 77-15-Sec 20 SE NW & SW NE	c.1875 House. J.A. McMains owner on 1905 County Atlas.	Potentially eligible
25		Farmstead	2380 135th Union Twp 77-15-Sec 21 SW NW	Circa 1920 Prairie-style house with 1892 barn.	Potentially eligible
26		Farmstead	1436 Hwy 63 Prairie Twp 77-16 Sec 25 SE NW	Circa 1920 Craftsman house with c.1900 barn.	Potentially eligible
27		Farmstead	1513 Kent Prairie Twp 77-16 Sec 35 NE NW	1910 Gambrel roof Colonial Revival house with 1935 barn and silos	Potentially eligible
28		House	1493 Kirby Prairie Twp 77-16 Sec 27 NE SE	1910 Queen Anne/Colonial Revival house	Potentially eligible

MAP NO.	PHOTO	PROPERTY NAME/TYPE	LOCATION	DESCRIPTION	FINDINGS
29		Farmstead	1607 Kirby Madison Twp 76-16 Sec 3 NE NE	Circa 1919 gambrel-roof Colonial Revival house with 1900 barn. Could be a kit house.	Potentially eligible
30		Farmstead	2075 170th Madison Twp 76-16 Sec 2 SW SE	Circa 1914 Prairie-style house with 1960 barn.	Potentially eligible
31		House	2079 175th Madison Twp 76-16 Sec 11 SW NE	1917 Prairie-style house.	Potentially eligible
32		Town of Lacey	Adams-Madison Twps	Lacey was surveyed in 1981 and every building was determined to be not eligible (Iowa Site Nos. 62-00598 through 62-00615).	The extant houses should be re-evaluated given the age of the prior survey.
33		Farmstead - **just outside of current study area**	2602 170th Adams Twp 76-15 Sec 11 NW NW	Gideon Daugherty House, 1872, with livestock barn. The house currently is clad in steel siding, which may affect eligibility, although rarity of type and likely historical significance could outweigh integrity issues.	62-00137 Opinion of Eligibility, 1984

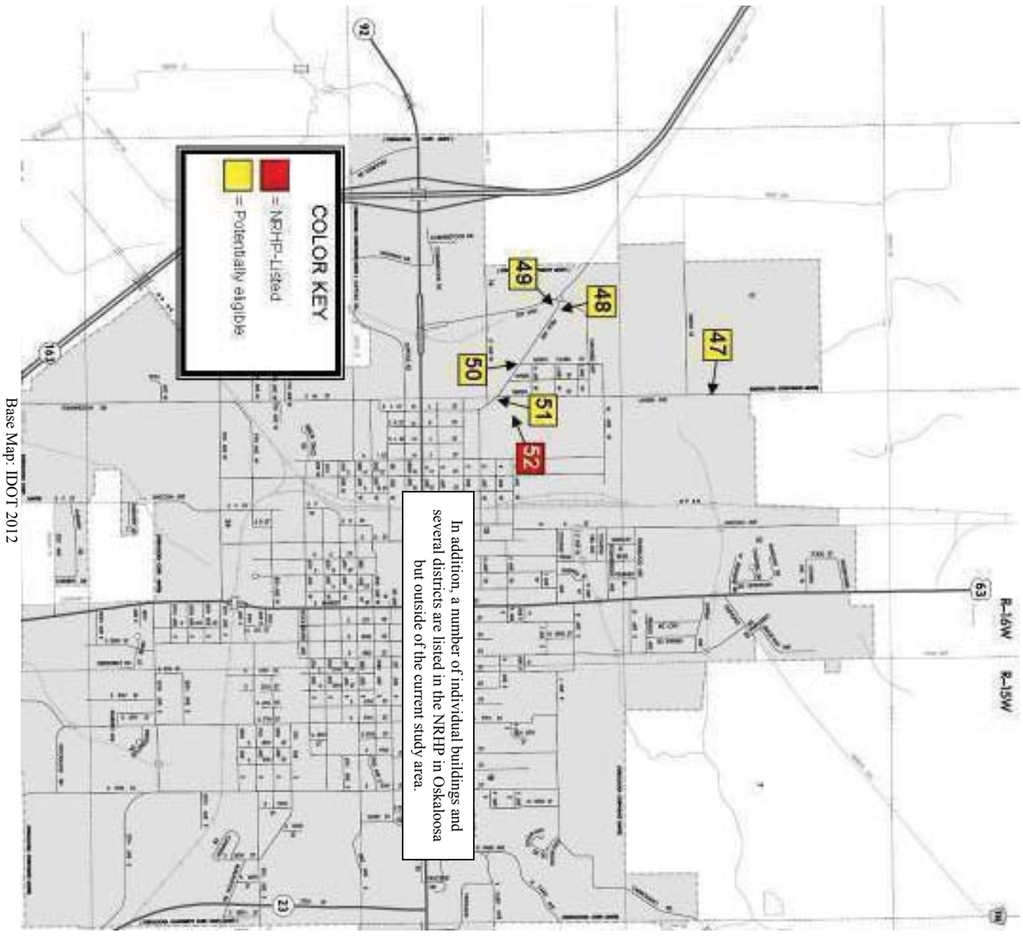
APPENDICES

MAP NO.	PHOTO	PROPERTY NAME/TYPE	LOCATION	DESCRIPTION	FINDINGS
34		House	1894 Hwy 63 Madison Twp, 76-16 Sec 13 SE SW	1914 Prairie-style house. One of several in the immediate vicinity.	Potentially eligible
35		Galeton Avenue Bridge - **just outside of current study area**	6.9 mi N of Oskaloosa Madison Twp 76-16 Secs 19 & 20 NW SW	Circa 1900 Pipe Kingpost Pony Truss Bridge by Seevers Manufacturing Co., Oskaloosa, Iowa. Never actually listed in the NRHP.	62-00147 Opinion of Eligibility (SHPO/SNRC 1996)
36		Farmstead	2020 Hwy 63 Madison Twp, 76-16 Sec 25 SE NW	c.1875 Italianate house with c.1880 barn. T.W. Dye is owner on 1875 Andreas map. This house is not listed on the assessor record, only a photo.	Potentially eligible
37		House	2102 Kirby Madison Twp, 76-16 Sec 26 SW SW	c1900 Queen Anne house. J.F. Whitehead owner on 1905 County Atlas.	Potentially eligible
38		House	2104 210th Madison Twp 76-16 Sec 36 W ½ SW	1916 Cross-gambrel roof house	Potentially eligible

MAP NO.	PHOTO	PROPERTY NAME/TYPE	LOCATION	DESCRIPTION	FINDINGS
39		Farmstead	2265 Independence Garfield 75-16 Sec 4 NE SE	1904 Gable-front-and-wing Queen Anne house with 1900 barn.	Potentially eligible
40		Barn	1865 Hwy 163 Garfield Twp 75-16 Sec 4 SW SE	Grandview Farm barn was built in 1861 by Miles Prine. The beams of this basement barn are oak and pine. Hand-hewn pegs can be seen in several areas (from Iowa Barn Foundation website). Also notable is the gable-end ramp entry.	Potentially eligible
41		Farmstead	2093 230th Lincoln Twp 75-16 Sec 2 SE SE	1850 Greek Revival style house (with some later modifications including steel siding) with 1900 barn.	Potentially eligible
42		House	2161 230th Lincoln Twp 75-16 Sec 1 Lot 4 Gerhardts Sub	1915 Craftsman house.	Potentially eligible
43		Nelson, Daniel, House and Barn - **just outside of current study area**	2 mi N of Oskaloosa RR #1 Spring Creek Twp 75-15 Sec 5 NW NW	Today the house and barn are part of the Nelson Pioneer Farm, an outdoor museum. Iowa Site No. 62-00079.	NRHP-Listed 11/20/1974

MAP NO.	PHOTO	PROPERTY NAME/TYPE	LOCATION	DESCRIPTION	FINDINGS
44		Farmstead - **just outside of current study area**	1722 235th Garfield Twp 75-16 Sec 8 NE SW	Circa 1910 Prairie-style house with c.1910 barn.	Potentially eligible
45		Rural School	2358 Kirby Lincoln Twp 75-16 Sec 11 NE SW	Possibly the former Union School on 1905 County Atlas. Barn on property.	Potentially eligible
46		Town of Evans - **just outside of current study area**	Garfield Twp 75-16 Sec 17	Coal mining town and shipping point for the American Coal Co. African American workers/residents were a high percentage of the population with separate facilities. A public school building and a few potential examples of worker housing are extant.	This townsite is disappearing quickly. Potentially eligible.

OSKALOOSA FINDINGS MAP



Base Map: IDOT 2012

KEY TO CITY OF OSKALOOSA FINDINGS MAP

MAP NO.	PHOTO	PROPERTY NAME/TYPE	LOCATION	DESCRIPTION	FINDINGS
47		House	2395 Laveen Lincoln Twp 75-16 Sec 11 SE SE Oskaloosa	1904 Cross-gable house. Dillon Stalker is owner on 1905 County Atlas.	Potentially eligible
48		Farmstead	1721 Pella Ave Lincoln Twp 75-16 Sec 14 Oskaloosa	Prairie-style house with barn now in city limits. Vanderwilt is owner on 1905 County Atlas.	Potentially eligible
49		Barn	1718 Pella Ave Lincoln Twp 75-16 Sec 14 Oskaloosa	Historic basement barn converted to store.	Potentially eligible

MAP NO.	PHOTO	PROPERTY NAME/TYPE	LOCATION	DESCRIPTION	FINDINGS
50		Monitor Roof Barn	Pella Ave, S side Lincoln Twp 75-16 Sec 14 Oskaloosa	Monitor Roof barn used as warehouse	Potentially eligible
51		Stepped gable building	125 Pella Ave Lincoln Twp 75-16 Sec 13 Oskaloosa	1929 stepped gable building near Southern Iowa Fairgrounds. Perhaps a Fairgrounds building	Potentially eligible
52		Stock Judging Pavilion	G Ave, Southern Iowa Fairgrounds Lincoln Twp Oskaloosa	Oskaloosa building contractor P.W. Sparks built the Stock Judging Pavilion at the fairgrounds in 1919. The pavilion, along with the Iowa State Fair pavilion in Des Moines and the Cattle Congress in Waterloo, are the only ones in the state with a round shape.	NRHP-Listed 4/12/1984 (62-02275)

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APPENDIX A:
HADB Form

Historical Architectural Data Base

Data Entry Form for Studies and Reports

Doc. No.: 00-273

Source of Study: ☐ Certified Local Government Project ☒ Section 106 Review & Compliance Project
☐ Historical Resource Development Program Project ☐ Other

Project Reference #: _____

Authors/Editor/Compiler/Originator:
Rogers, Leah D., and Jennifer A. Price

Author Role: ☒ Consultant ☐ Private Researcher/Writer ☐ Teacher ☐ Student
☐ Project employee/volunteer ☐ Site Administrator ☐ Other: _____

Title of Work:
U.S. Highway 63 Corridor Study, Mahaska and Poweshiek Counties, Iowa:

Architectural/Historical Reconnaissance Survey

Year Issued: 2012

Type of Work Performed:
(*check one only*)

Survey:

☐ Windshield survey minimum level documentation
☒ Reconnaissance survey to make recommendations for intensive survey(s).
☐ Intensive survey
☐ Mixed intensive and reconnaissance survey

Plan:

☐ Planning for Preservation/Survey
☐ Community Preservation Plan

Property Study:

☐ Iowa Historic Property Documentation Study
☐ Historic American Building Survey (HABS)
☐ Historic American Engineering Record (HAER)
☐ Management or Master Plan
☐ Historic Structure Report
☐ Feasibility/Re-use Study
☐ Architectural/Engineering Plans and Specs.

National Register:

☐ Multiple Property Documentation Form

Other (e.g., private research, school project, video): _____

HADB Form
12/1/99

U.S. Highway 63 Corridor Study, Mahaska and Poweshiek Counties, Iowa: Architectural/Historical Reconnaissance Survey 00-273

Kind of Work Produced:
(*fill in one section only: Report or Monograph or Chapter, etc.*)

Report: Published/produced by: Tallgrass Historians L.C.
Place issued: 2460 S. Riverside Drive, Iowa City, IA 52246
Client: Snyder and Associates, Inc., 2727 SW Snyder Blvd., Ankeny, IA 50023
If applicable, include:
Series Title: _____
Volume #: _____ Report #: _____

Monograph: Publisher Name: _____
Place: _____

Chapter: In: _____ First pg. #: _____ Last pg. #: _____

Journal: Name: _____ Vol. _____ No. _____ Pages: _____ to _____

Thesis: Degree (check one): ☐ Ph.D. ☐ LL.D. ☐ M.A. ☐ M.S. ☐ B.A. ☐ B.S.
Name of College/University: _____

Paper: Meeting: _____
Place: _____

Other: _____

Geographic Scope of Study:
☒ City/town ☒ Township(s) ☒ County ☐ Region of Iowa ☐ Statewide ☐ Other: _____

State:	IA	IA	IA	IA
County:	Mahaska	Mahaska	Poweshiek	Poweshiek
Town:	Oskaloosa	New Sharon	Montezuma	Malcom
Township:	75N	77N	78N	80N
Range:	15W	15W	15W	15W

Time Focus: (check any decades that receive particular attention)
☐ before 1830 ☐ 1830s ☒ 1840s ☒ 1850s ☒ 1860s ☒ 1870s ☒ 1880s ☒ 1890s
☒ 1900s ☒ 1910s ☒ 1920s ☒ 1930s ☐ 1940s ☐ 1950s ☐ 1960s ☐ 1970s ☐ 1980/later

Keyword: (Index of any subjects, topics, or people given prominent attention in the report)

U.S. Highway 63	Oskaloosa
Malcom	New Sharon
Montezuma	architecture
history	Underground Railroad
agriculture	early settlement
farmsteads	barns
transportation	coal mining
ethnic settlements	religious settlements

HADB Form
12/1/99

APPENDIX B:
List of Previously Inventoried Architectural/Historical Properties in U.S. 63 Corridor Study Area & Vicinity

PREVIOUSLY INVENTORIED ARCHITECTURAL/HISTORICAL PROPERTIES

Site No	Resource Name	NRHP Listed	Property Type	Str No	Dr	Street Name			Location	City/Twp	Date	Previous Evaluation	Eval Date
POWESHIEK COUNTY													
79-00006	Octagon Barn		Building(s)	1574		Hwy 85			1.5 mi E of Montezuma – 4 SW SE	Montezuma Jackson	0	not evaluated	
79-00007	Farmstead		District	0					1 mi E of Montezuma – 5 SW SE	Montezuma Jackson	0	Not Extant	2012
79-00008	House		Building(s)	0					1 mi E of Montezuma – 5 SW SE	Montezuma Jackson	0	Not Extant	2012
79-00009	Forest Home Townsite		Building(s)	0					6 mi S of Montezuma - old town site - also Williamsburg – 29 NE NE	Montezuma Union	1850	**ELIGIBLE**	1994
79-00010	Bridge # 291580		Structure	0					4.7 mi W of Montezuma	Montezuma Union	1913	not eligible	1990
79-00011	Poweshiek County Farm Home		District	0					3 mi E of Searsboro – 7 NE SW	Searsboro Jackson	1872	not eligible	1975
79-00012	Poweshiek County Farm; House		Building(s)	0					3 mi E of Searsboro – 7 NE SW	Searsboro Jackson	1972	not eligible	1975
79-00013	Bridge # 291610		Structure	0					4.2 mi W of Montezuma – 8 SW NE	Montezuma Union	1918	not eligible	1990
79-00014	Bridge # 45780		Structure	0					3 mi S of Montezuma -	Montezuma Jackson	1938	not eligible	1984
79-00020	Bridge # 292000		Structure	0					3 mi S of Searsboro	Searsboro	1912	not eligible	1983
79-00021	McDowell Bridge	1998 Delisted 2012	Structure	0					vacated county road over N Skunk River – 35 NW NW	Spring Creek		Not Extant	
79-00028	North English River Bridge #292490		Structure	0					3.5 mi NE of Montezuma – 21 NE NW	Montezuma Scott	1913	not eligible	1984
79-00029	Bridge # 292570		Structure	0					2.5 mi N of Montezuma – 34 NE SE	Montezuma Scott		not eligible	1993
79-00031	Buck Creek Bridge # 293030		Structure	0					2.7 mi NE of Searsboro – 35 SW NW	Searsboro Washington	1916	not eligible	1990
79-00040	Little Bear Creek Bridge # 293580		Structure	0					2 mi E of Malcolm – 29 SW SW	Malcolm Bear Creek		not eligible	1990
79-00041	Bear Creek Bridge		Structure	0					5 mi NE of Grinnell – 3 SW SW	Grinnell Malcolm		not eligible	1977
79-00041	Bear Creek Bridge		Structure	0					5 mi NE of Grinnell – 4 SE SE	Grinnell Malcolm		not eligible	1977
79-00078	Poweshiek County Courthouse	7/2/1981	Building(s)	0	E	Main	St		Town Square	Montezuma	1856	**NRHP**	1981
79-00079	New Carroll House Hotel	10/1/1979	Building(s)	0	E	Main	St		E Main & 5th St	Montezuma	1892	**NRHP**	1979
79-00560	City of Montezuma Water Treatment Plant		Building(s)	1185		Diamond Trail	Rd		2 SE	Montezuma Union	1953	not eligible	2010
79-00563	Buck Creek Bridge #291710		Structure	0		512th	St			Montezuma Union	1956	Not Extant	

MAHASKA COUNTY												
62-00076	Nelson Pioneer Farm and Museum / Spring Creek Township Voting House		Building(s)	0				2 miles NE of Oskaloosa	Oskaloosa Sprg Creek	1877	NRHP	1981
62-00077	Nelson Pioneer Farm and Museum / Ronze-Morgan Log House		Building(s)	0				2 miles NE of Oskaloosa	Oskaloosa Sprg Creek	1850	NRHP	1981
62-00078	Bridge		Structure	0				1.5 miles NE of Oskaloosa	Oskaloosa Sprg Creek	0	not evaluated	
62-00079	Nelson, Daniel, House and Barn	11/20/1974	Building(s)	0		Glendale	Rd	2 miles N of Oskaloosa, RR #1	Oskaloosa Sprg Creek	1853	**NRHP**	1974
62-00080	East Center Schoolhouse (moved to Nelson Farmstead)		Building(s)	0				1.5 miles N of Oskaloosa	Oskaloosa Sprg Creek	1873	**ELIGIBLE**	1981
62-00081	Spring Creek Meeting House		Building(s)	0				1 mile NE of Oskaloosa	Oskaloosa Sprg Creek	1853	Not Extant	SHPO
62-00108	West Center Schoolhouse		Building(s)	0				2 miles N of Oskaloosa	Oskaloosa Lincoln	0	Not Extant	2012
62-00109	Prine, Miles K., Farmstead		District	0				3 miles NW of Oskaloosa	Oskaloosa Garfield	0	Not Extant	2012
62-00110	Black Cemetery		District					½ mile W of Evans [on private property?]	Evans Garfield		not evaluated	1981
62-00135	Bridge #237280		Structure	0				7 miles NE of Oskaloosa	Oskaloosa Adams	1961	not eligible	1989
62-00136	Quick, D.C., House		Building(s)	0				7 miles NE of Oskaloosa	Oskaloosa Adams	0	not eligible	1981
62-00137	Daugherty, Gideon, Farmhouse		Building(s)	2602		170th	St	8 miles NE of Oskaloosa	Oskaloosa Adams	1872	**ELIGIBLE**	1984
62-00138	Dodds, John, Farmhouse		Building(s)	0				7 miles NE of Oskaloosa	Oskaloosa Adams	1865	Not Extant	2012
62-00139	Davis, J.D., Farmhouse		Building(s)	0				6 miles NE of Oskaloosa	Oskaloosa Adams	0	Not Extant	2012
62-00140	Bridge #237520		Structure	0					Oskaloosa Madison	1954	not evaluated	n/a
62-00142	The Curve Station		District	0				7 miles N of Oskaloosa	Oskaloosa Madison	1935	not eligible	1995
62-00143	House		Building(s)	0				7 miles N of Oskaloosa	Oskaloosa Madison	0	Not Extant	2012
62-00144	Building		Building(s)	0				7 miles N of Oskaloosa	Oskaloosa Madison	1935	not eligible	1995
62-00145	Machine Shed		Building(s)	0				7 miles N of Oskaloosa	Oskaloosa Madison	1970	not eligible	1995
62-00146	Holliday-Russell Farmstead		Building(s)	0				6 miles N of Oskaloosa	Oskaloosa Madison	1901	not eligible	1995
62-00147	Galeton Avenue Bridge		Structure	0				6.9 miles NW of Oskaloosa	Oskaloosa Madison	1900	**ELIGIBLE**	SNRC 1996
62-00148	Minneapolis & St Louis Railroad Overpass Bridge		Structure	0				2 miles N of Oskaloosa	Oskaloosa Madison	1936	not eligible	1995
62-00149	Bridge		Structure	0				3.5 miles N of Oskaloosa	Oskaloosa Madison	0	not eligible	1977
62-00153	Oskaloosa Water Works		Building(s)	0				3.5 miles N of Oskaloosa	Oskaloosa Madison	0	not eligible	1977, 1981
62-00154	Oskaloosa Water Works Bridge		Structure	0				3.5 miles N of Oskaloosa	Oskaloosa Madison	1881	not eligible	1982
62-00174	Bridge #237960		Structure	0				3.5 miles NE of New Sharon	New Sharon Union	1955	not eligible	1990
62-00175	North Skunk River Bridge	5/15/1998	Structure	0				1.8 miles NE of New Sharon	New Sharon	1920	**NRHP**	1998

								Union			
62-00176	Bridge #238050		Structure	0			3 miles NE of New Sharon	New Sharon Union	0	not eligible	1986
62-00177	Bridge #0034940		Structure	0			2.5 miles E of New Sharon	New Sharon Union	1930	not eligible	1983
62-00178	Bridge #0034930		Structure	0			2.5 miles E of New Sharon	New Sharon Union	1930	not eligible	1983
62-00181	Farmstead		District				½ mile S of New Sharon (Sec 24 SE NW)	New Sharon		not eligible	1995
62-00182	House		Building(s)				½ mile S of New Sharon (Sec 24 SE NW)	Prairie		not eligible	1995
62-00183	Barn		Building(s)				½ mile S of New Sharon (Sec 24 SE NW)	New Sharon		not eligible	1995
62-00184	Barn		Building(s)				½ mile S of New Sharon (Sec 24 SE NW)	Prairie		not eligible	1995
62-00185	Farmstead		District				½ mile S of New Sharon (Sec 24 SE SW)	New Sharon		not eligible	1995
62-00186	Farmstead, House		Building(s)				½ mile S of New Sharon (Sec 24 SE SW)	Prairie		not eligible	1995
62-00187	Farmstead, Barn		Building(s)				½ mile S of New Sharon (Sec 24 SE SW)	New Sharon Prairie		not eligible	1995
62-00188	Farmstead, House		Building(s)				½ mile S of New Sharon (Sec 24 SE SW)	New Sharon Prairie		not eligible	1995
62-00189	Bridge #238350		Structure	0			5 miles SW of New Sharon	New Sharon Prairie	0	not eligible	1987
62-00438	The Evans Hotel		Building(s)	0			Block 9 and W1/2 Block 10, Evans Plat	Evans Garfield	0	not eligible	1981
62-00598	House		Building(s)	0			Located in town of Lacey	Lacey Adams	1920	not eligible	1981
62-00599	Grocery Store		Building(s)	0			Located in Lacey, south of Lacey School	Lacey Adams	1920	not eligible	1981
62-00600	Building		Building(s)	0	Ballinger	St	Located on the South side of Ballinger St	Lacey Adams	1900	Not Extant	1981
62-00601	House		Building(s)	0	Broadway	St	located on the North side of Broadway	Lacey Adams	1925	not eligible	1981
62-00602	House		Building(s)	0	Broadway	St	Located on the North side of Broadway St	Lacey Adams	1900	not eligible	1981
62-00603	House		Building(s)	0	Broadway	St	Located on the North side of Broadway St	Lacey Adams	1900	not eligible	1981
62-00604	Lacey United Methodist Church		Building(s)	0	Broadway	St	Located on the North side of Broadway St	Lacey Adams	1880	not eligible	1981
62-00605	House & Shed		Building(s)	0	Broadway	St	Located on the South side of Broadway East of Sleeper St	Lacey Adams	1900	not eligible	1981
62-00606	House		Building(s)	0	Broadway	St	Located at the NE corner of Broadway & Wilson Sts	Lacey Adams	1920	not eligible	1981
62-00607	House		Building(s)	0	Broadway	St	Located at Southwest corner of Broadway & Wilson Sts	Lacey Adams	1920	not eligible	1981
62-00608	House		Building(s)	0	Miller	St	Located at the NE corner of Miller & Packhurst Sts	Lacey Adams	1890	not eligible	1981
62-00609	House		Building(s)	0	Miller	St	Located on the East side of Miller St	Lacey Adams	1900	Not Extant	1981
62-00610	House & Shed		Building(s)	0	Parkhurst	St	Located at the NE corner of Parkhurst & Wilson Sts	Lacey Adams	1890	not eligible	1981
62-00611	Barn & Garage		Building(s)	0	Sleeper	St	Located at the SE corner of Sleeper & Parkhurst Sts	Lacey Adams	1900	not eligible	1981
62-00612	House		Building(s)	0	Wilson	St	Located on the East side of Wilson St	Lacey Adams	1900	Not Extant	1981

62-00613	Lacey School		Building(s)	0	Wilson	St	Located on the East side of Wilson St	Lacey Adams	1915	More research recommended	1981
62-00614	House		Building(s)	0	Wilson	St	Located at the NW corner of Wilson & Ballinger Sts	Lacey Adams	1920	not eligible	1981
62-00615	House		Building(s)	0	Wilson	St	Located at the SW corner of Wilson & Parkhurst Sts	Lacey Adams	1910	not eligible	1981
62-00993	Nelson Pioneer Farmstead / Coal Creek Friends Meeting House		Building(s)	0			1.8 miles NE of Oskaloosa	Oskaloosa Sprg Creek	1864	not evaluated	1992
62-02275	Stock Judging Pavilion	4/12/1984	Building(s)	0	G	Ave	on Southern Iowa Fairgrounds	Oskaloosa	1920	**NRHP**	1984
62-02833	House (Prairie-style) [and barn]		Building(s)	1721	Pella	Ave	NW edge of Oskaloosa	Oskaloosa	1915	not eligible	1981
62-03115	James Property		District	2189	U.S. 63		Aprox. 2 miles N of Oskaloosa	Oskaloosa Madison	0	not eligible	1999
62-03116	Franklin, Nettie, House		Building(s)	2170	U.S. 63		Aprox. 2 miles N of Oskaloosa	Oskaloosa Madison	0	not eligible	1999
62-03117	Upton House		Building(s)	2164	U.S. 63		Aprox. 2 miles N of Oskaloosa	Oskaloosa Madison	0	not eligible	1999
62-03118	Kentfield Farmstead		District	2163	Hwy 63			Oskaloosa Madison	1940	not eligible	1999
62-03119	Kentfield Farmstead: Octagonal Shed		Building(s)	2163	Hwy 63			Oskaloosa Madison	1920	not eligible	1999
62-03120	Passalia House		Building(s)	2132	210th	St		Oskaloosa Madison	1965	not eligible	1999
62-03121	Springer Farmstead		District	2131	210th	St	Aprox. 3 miles N of Oskaloosa	Oskaloosa Madison	0	not eligible	1998
62-03122	Springer Farmstead - House		Building(s)	2131	210th	St	Aprox. 3 miles N of Oskaloosa	Oskaloosa Madison	0	not eligible	1998
62-03123	Ogle / Hall Farmstead		District	1811	U. S. 63		Aprox. 3 miles N of Oskaloosa	Oskaloosa Madison	0	Not Extant	2012
62-03124	Ogla / Hall Farmstead - House		Building(s)	1811	U. S. 63		Aprox. 3 miles N of Oskaloosa	Oskaloosa Madison	1946	Not Extant	2012
62-03125	Masteller, Elmer, Farmstead		District	1797	U. S. 63		Aprox. 5 miles S of New Sharon	New Sharon Madison	0	Not Extant	2012
62-03126	Masteller, Elmer, Farmstead - House		Building(s)	1797	U. S. 63		Aprox. 5 miles S of New Sharon	New Sharon Madison	1870	Not Extant	2012
62-03127	Vandonselaar, Don, House		Building(s)	1767	U. S. 63		Aprox. 4 miles S of New Sharon	New Sharon Madison	1994	Not Extant	2012
62-03128	Vandonselaar, Suart & Cindy Glazebrook, Farmstead		District	1760	U. S. 63		Aprox. 4 miles S of New Sharon	New Sharon Madison	0	Not Extant	2012
62-03129	Van Donselaar, John, Farm		District	2109	175th	St	Aprox. 4 miles S of New Sharon	New Sharon Madison	0	Not Extant	2012
62-03130	Stone, Delmer, Farmstead [modern house, no barn]		District	1563			U.S. 63	New Sharon Prairie	1890	not eligible	SHPO 1999
62-03133	Johnson, Hanley, Farmstead [no barn]		District	1548			U.S. 63	New Sharon Prairie	1870	not eligible	SHPO 1999
62-03134	Johnson, Hanley Farmstead: House		Building(s)	1548			U.S. 63	New Sharon Prairie	1870	not eligible	SHPO 1999
62-03243	Penn College Historic District	4/4/1996	District	0			Trueblood Ave	Oskaloosa	1917	**NRHP**	1996
62-03301	Penn College Historic District: Southwest Memorial Gate	3/29/1996	Structure	201	Trueblood	Ave		Oskaloosa	1917	**NRHP**	1996
62-03302	Penn College Historic District: Tennis Courts	3/29/1996	Structure	201	Trueblood	Ave		Oskaloosa	0	**NRHP**	1996
62-03308	Bodgaard House		Building(s)	1754	220th		Aprox. 3 miles NW of Oskaloosa	Oskaloosa Garfield	0	not eligible	1991
62-03309	House		Building(s)	1769	Hwy 163		Aprox. 1.5 miles N of Evans	Evans	0	not eligible	1991

								Garfield			
62-03310	Mick, Charles, House		Building(s)	0			Aprox. 2 miles NW of Oskaloosa	Oskaloosa Lincoln	0	Not Extant	2012
62-03311	Bartlett House		Building(s)	1955	Old Hwy 163		Aprox. 2 miles NW of Oskaloosa	Oskaloosa Lincoln	0	not eligible	1991
62-03312	Overbergen House		Building(s)	0			Aprox. 1.5 miles NW of Oskaloosa	Oskaloosa Lincoln	0	Not Extant	2012
62-03314	House – [Big Farmstead]		Building(s)	1983	Old Hwy 163		Aprox. 1.5 miles NW of Oskaloosa	Oskaloosa Lincoln	0	not eligible	1991
62-03315	Brown, Bill, House **[not found on assessor map]**		Building(s)	0			W edge of Oskaloosa	Oskaloosa Lincoln	0	not eligible	1991
62-03316	Benson House		Building(s)	0			Aprox. 1 mile W of Oskaloosa	Oskaloosa Lincoln	0	Not Extant	2012
62-03317	Bridge # 236540		Structure	0			Aprox. 3 miles W of Oskaloosa	Oskaloosa Garfield	0	not eligible	1991
62-03341	House		Building(s)	0			Aprox. 6 miles NW of Oskaloosa	Oskaloosa Lincoln	0	Not Extant	2012
62-03364	Nieuwsma, Daryl, House		Building(s)	0			Approximately 3 1/2 miles NE of New Sharon	New Sharon Union	0	not eligible	1992
62-03365	Bridge		Structure				Section 13 SW NE	New Sharon Prairie		not eligible	1983
62-03452	McConnell-Gosnell Farmstead		District	2173	US Highway 63			Oskaloosa Madison	1890	not eligible	2005
62-03453	McConnell-Gosnell Farmstead - Barn		Building(s)	2173	US Highway 63			Oskaloosa Madison	1890	not eligible	2005
62-03454	Young, Amos T. and Sarah J., Farmstead		Building(s)	2160	US Highway 63			Oskaloosa Madison	1860	not eligible	2005
62-03455	Shroyer-McConnell House		Building(s)	2152	US Highway 63			Oskaloosa Madison	1910	not eligible	2005
62-03456	McConnell, Eugene and Gertrude Farmstead		District	2140	US Highway 63			Oskaloosa Madison	1890	not eligible	2005
62-03458	Williams-Quarton Farmstead		District	2123	210th	St		Oskaloosa Madison	1910	not eligible	2005
62-03459	Williams-Quarton Farmstead - Barn		Building(s)	2123	210th	St	Sec 36 SE NW	Oskaloosa Madison	1915	More research recommended	2005
62-03461	Malloy, Rod and Patty, House		Building(s)	2167	Forrest	Ave		Oskaloosa Madison	1978	not eligible	2005
62-03462	Lowry, Charles and Patricia, House		Building(s)	0				Oskaloosa Madison	1998	not eligible	2005

U.S. HIGHWAY 63 CORRIDOR STUDY, MAHASKA AND POWESHIEK COUNTIES, IOWA:

Phase IA Archaeological Assessment

IDOT Project No. STP-S-CO62(78)--5E-62

Snyder & Associates Project No. 111.0979.01

Tallgrass Historians Report No. TH12-556--1

Submitted to

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ABSTRACT

There are currently no archaeological sites in the two-county study area that have been listed in the National Register of Historic Places. Of the 42 previously recorded sites in the study area portion of Poweshiek County, only 22 have been evaluated as ineligible for the National Register. Seventeen of the sites have no evaluation, with three other sites recommended for additional Phase I in order to determine if potentially eligible. One of the unevaluated sites, 13PH184, is a large multi-component Archaic-Woodland site that is likely potentially eligible for the National Register because of its large size and the density of material collected by the Parker family and others from this site. The site is in the uplands and may have been impacted by erosion and cultivation to the point that it does not possess sufficient integrity to be considered National Register eligible; however, it will require full Phase I and potentially Phase II testing to make a final determination of either eligibility or ineligibility. This site straddles the western boundary of the current study area on the west side of Highway 146 southeast of Searsboro. It is situated along the edge of one of the potential road improvement corridors for the U.S. Highway 63 project.

Of the 70 previously recorded archaeological sites in the study area portion of Mahaska County, 36 sites have been evaluated as ineligible for the National Register. Thirty-one sites have no evaluation (listed either as no evaluation or status undetermined), with three sites evaluated as potentially eligible. Sites 13MK277 (a historic site), 13MK344 (a multi-component historic/prehistoric site including a Late Prehistoric Great Oasis component), 13MK384 (mid-19th century historic site), 13MK385 (an Early Archaic isolated find), 13MK410 (a Woodland open habitation site), 13MK520 (a historic GLO-mapped cabin site), and 13MK533 (also a GLO-mapped cabin site), are highlighted as potentially significant sites that would require additional Phase I and/or Phase II testing in order to make a final determination of eligibility or ineligibility for the National Register.

In general, the previously recorded sites that have received no evaluation could be found to be significant upon further field investigation; however, those sites, which have been investigated sufficiently and determined to be ineligible for the National Register, would warrant no additional archaeological investigation.

Furthermore, it should be considered that the majority of the current study area has not been systematically surveyed for archaeological resources; therefore, new sites will likely be encountered within any of the project corridors selected for intensive Phase I investigation.

Prehistoric site potential of the current study area is generally moderate to high, with the highest potential being within the creek and river valleys and the upland valley margins. Site density typically drops with distance from reliable water sources; however, trail routes along upland divides will likely have camp sites and isolated finds along these early routes.

Sites in upland positions in locations that have been subjected to intensive cultivation in the historic and modern eras will likely have impacted integrity, often to the point that the site deposits are confined to the plow zone of a location. Sites found in such situations are unlikely to qualify for National Register listing because of poor integrity. Site locations that have been in pasture or woodland for most of the historic and modern eras have a much greater potential for good integrity and National Register eligibility.

The alluvial valleys of the study area, where they have not been channelized or otherwise altered, have a high potential for prehistoric sites in a buried context within the terrace landform sediment assemblages. Sites in these locations could be found in a near-surface to deeply buried contexts, with buried sites having a very good potential for National Register eligibility because the integrity of a buried site is often well preserved by the act of burial within alluvial/colluvial deposits.

There is potential for sites dating from the early historic to modern eras within the majority of the study area. Site types will include: early habitation sites, later farmstead sites, mill sites, coal mine sites, cemeteries and pioneer burial grounds, rural church and schools sites, former post offices, stagecoach stops, Underground Railroad sites, crossroads settlement sites, and abandoned or sparsely populated former townsites.

None of the potential project corridors encompassed within the overall study area have been previously surveyed for archaeological resources except for small parcels or narrow corridors along existing roadways. As such, most of the selected preferred corridor or corridors will require Phase I investigation of the Area of Potential Effect, likely resulting in the identification of previously unrecorded prehistoric and historic sites. Any identified sites would be evaluated for potential National Register eligibility resulting in either a determination of ineligibility or potential eligibility. Ineligible sites would warrant no further investigation, while potentially eligible sites would be recommended for either avoidance or Phase II testing if they could not be feasibly or prudently avoided by the proposed highway construction project.

Cemeteries or locations containing human remains are further protected by local and state laws and are generally recommended for preservation and protection from impacts. The known historic period cemeteries have been identified in the current assessment; however, unmarked pioneer burials and burying grounds could be encountered within the study area, their locations yet to be identified. At present, no prehistoric burial sites have been identified in the study area; however, such sites could be encountered in the vicinity of the major creek and river valleys of the area.

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Introduction

The following is a Phase IA archaeological assessment of the proposed U.S. Highway 63 Corridor Study in Mahaska and Poweshiek Counties, Iowa (Figures 1-2). The assessment was conducted for Snyder and Associates, Inc, of Ankeny, Iowa, by Tallgrass Historians L.C. of Iowa City. **The study area encompasses approximately 124,538 ac (50,438 ha)**, an area that includes three potential road corridors and buffer areas around and in-between those corridors for planning purposes (see Figures 1-2). The study area extends from the west side of Oskaloosa in Mahaska County to around U.S. Highway 6 just north of Malcom in Poweshiek County (see Figures 1-2). Other towns within the overall study area include Montezuma and New Sharon. An architectural/historical reconnaissance study was also undertaken for this project, with the results of that study reported in Rogers and Price (2012).

The purpose of a Phase IA Archaeological Assessment is to evaluate and assess the archaeological potential of the study area and its vicinity, with the specific objective of identifying any known or potential National Register-eligible archaeological properties within the project parcel. This assessment also included a "windshield," or reconnaissance-level survey of the study area to further assess archaeological potential.

The study area encompasses land in parts of Malcom, Bear Creek, Grinnell, Washington, Scott, Sugar Creek, and Jackson townships in Poweshiek County as well as all of Pleasant and Union townships in that county (see Figures 1-2). This includes townships 78N through 80N and ranges 14W through 16W. In Mahaska County, the study are includes parts of Prairie, Union, Madison, Adams, Lincoln and Garfield townships, from townships 75N through 77N and ranges 15W through 16W (see Figure 2).

The study area is generally located in the Southern Iowa Drift Plain region in south-central Iowa (Figure 3) (Prior 1991). Much of the landscape involved in this study area consists of upland landforms, although the study corridor does cross several major alluvial valleys including those of the North English River, the North Skunk River, and the South Skunk River. In addition, are a number of smaller creek valleys that cross or bisect the study area in both Poweshiek and Mahaska counties. Figures 4-8 present the soil survey maps from the major alluvial valleys within the study area. These areas, where not impacted by modern construction or artificial channelizing activities, would be considered to have some potential for significant prehistoric and/or early historic sites in a buried context. The deepest buried potential would be in the major river valleys bisecting the corridor. Plates 1-5 show some of the valleys within the study area including at least one channelized section. Figure 9 is the LANDMASS prehistoric site probability maps of the study area showing site potential to be highest along the area's alluvial valleys.

Methods

In order to complete the archaeological assessment, documentary and archival sources were examined. These sources included: the archaeological site records and previous survey areas contained in the I-Sites: an Online GIS and Database for Iowa Archaeology maintained by the Office of the State Archaeologist in Iowa City and updated from the files maintained by the State Historic Preservation Office in Des Moines; the NADB files also accessed through the I-Sites database; historic maps and atlases available at the State Historical Society of Iowa in Iowa City and through online sources; and previous cultural resource studies in the project area vicinity.

In addition the study included a windshield, reconnaissance level survey that involved driving the roads of the study area in order to further assess archaeological potential and to help pinpoint potentially significant archaeological sites. In most instances, the sites checked through windshield survey were indicated by historic plat map and other historical data. These sites include former townsites, mill sites, coal mines, school and church sites, and pioneer cemeteries and burial grounds.

The archival and windshield survey data were then plotted on maps. Sites were pinpointed that are either known to have, or appear to have, some potential for National Register eligibility. Sites, such as cemeteries, were further pinpointed because of the sensitive nature of the site type.

Tallgrass Historians L.C. Research Associates, Adam J. Meseke and Cindy L. Nagel, conducted the background research and the windshield survey. The report was co-authored by the Principal Investigator, Leah D. Rogers and Research Associates, Meseke and Nagel. The Principal Investigator is solely responsible for the content and accuracy of this report with respect to site location, description, assessment, and recommendations.

Previous Investigations

A number of previous archaeological investigations have been conducted in the study area, but are primarily limited to road corridor studies that are limited in width and length. Figures 10-12 show the locations that have been previously surveyed. It can be seen that the largest concentration of previous survey areas is in the Oskaloosa vicinity related to highway construction projects. The area of the current study corridor that has seen the least amount of prior survey is in the north end (see Figure 10). The following is a selected list of prior surveys in the current study area representing the major previous Phase I investigations conducted in this area:

R&C Number: 810190085
KEAN, JOHN N. AND JAMES M. ZALESKY
1980 A PHASE I CULTURAL RESOURCE SURVEY OF IOWA SOUTHERN UTILITIES PROPOSED MONTEZUMA, IOWA TO OTTUMWA, IOWA TRANSMISSION LINE. CONTRACT COMPLETION REPORT 187. OFFICE OF THE STATE ARCHAEOLOGIST, UNIVERSITY OF IOWA, IOWA CITY, IA.
Site(s): 13MK56 - 13MK72, 13PH25 - 13PH35, 13WP112 - 13WP115

R&C Number: 770562001
HOTOPP, JOHN A.
1978 RF-63-3(25) PROJECT COMPLETION REPORT SUPPLEMENT PRIMARY ROADS. IOWA DEPARTMENT OF TRANSPORTATION PROJECT COMPLETION REPORT 2(11). OFFICE OF THE STATE ARCHAEOLOGIST, UNIVERSITY OF IOWA, IOWA CITY, IA.
Site(s): no sites found

R&C Number: 770562001
HOTOPP, JOHN A. AND MICHAEL LIPSMAN
1977 F-63-3(25) MAHASKA COUNTY BRIDGE REPLACEMENT. OFFICE OF THE STATE ARCHAEOLOGIST, IOWA CITY, IA. SUBMITTED TO IOWA DEPARTMENT OF TRANSPORTATION, AMES, IA.
Site(s): no sites found

&C Number: 840262021
HUDSON, LUANN
1984 BROS-9062(9) MAHASKA COUNTY LOCAL ROADS. IDOT PCR 7(179). OFFICE OF THE STATE ARCHAEOLOGIST, UNIVERSITY OF IOWA, IOWA CITY, IA.
Site(s): no sites found

R&C Number: 950762006
MORROW, JULIE
1995 PHASE I ARCHAEOLOGICAL SURVEY OF PRIMARY ROADS PROJECT NHS-63-3(51)--19-62 A.K.A. PIN 94-62010-1 MAHASKA COUNTY. PCR 18(8). HIGHWAY ARCHAEOLOGY PROGRAM, UNIVERSITY OF IOWA, IOWA CITY, IA.
Site(s): 13MK358 - 13MK395

R&C Number: 790062001
TILL, ANTON AND BLANE H. NANSEL
1983 AREA XV CULTURAL RESOURCES SURVEYS MAHASKA COUNTY ARCHAEOLOGY. AREA XV REGIONAL PLANNING COMMISSION, OTTUMWA, IA. SUBMITTED TO SHPO, DES MOINES, IA.
Site(s): 13MK50 - 13MK55, 13MK77 - 13MK100, 13MK131 - 13MK161, 13MK165 - 13MK198, 13MK207 - 13MK246

R&C Number: 091179088
MORROW, TOBY A.
2009 PHASE I INTENSIVE ARCHAEOLOGICAL SURVEY OF A PROPOSED DEVELOPMENT AROUND CIMARRON AND FOUR WETLAND MITIGATION AREAS IN SOUTHWESTERN POWESHIEK COUNTY, IOWA. 422. WAPSI VALLEY ARCHAEOLOGY, INC., ANAMOSA, IOWA.
Site(s): no sites found

R&C Number: 091179088
MORROW, TOBY A.
2009 PHASE I INTENSIVE ARCHAEOLOGICAL SURVEY OF A PROPOSED LAKE IMPOUNDMENT, LAKE PONDEROSA, POWESHIEK COUNTY, IOWA. 365. WAPSI VALLEY ARCHAEOLOGY, INC., ANAMOSA, IOWA.
Site(s): no sites found

R&C Number: 860879038
MERRY, CARL A.
1986 A PHASE I ARCHAEOLOGICAL SURVEY OF LOCAL SYSTEMS PROJECT FM-79(7), PREVIOUSLY KNOWN AS 2523, POWESHIEK COUNTY, IOWA. IOWA DEPARTMENT OF TRANSPORTATION PROJECT COMPLETION REPORT 9(128). OFFICE OF THE STATE ARCHAEOLOGIST, UNIVERSITY OF IOWA, IOWA CITY, IA.
Site(s): no sites found

R&C Number: 770079000
ABBOTT, LARRY R.
1977 AN ARCHAEOLOGICAL RESOURCE SURVEY OF THE PROPOSED MONTEZUMA WASTEWATER TREATMENT FACILITY, SITES "A" AND "B," MONTEZUMA, IOWA. CONTRACT COMPLETION REPORT 104. OFFICE OF THE STATE ARCHAEOLOGIST, UNIVERSITY OF IOWA, IOWA CITY, IA.
Site(s): no sites found

R&C Number: 000800022
MCNERNEY, MICHAEL J.
2001 TOUCH AMERICA - PROPOSED INSTALLATION OF A FIBER OPTIC CABLE FROM COUNCIL BULFFS TO DAVENPORT - PROPOSED RESEARCH DESIGN & FIELD METHODS - ARG CRM #1031 - PHASE I CULTURAL RESOURCES SURVEY FROM EARLHAM EAST TO DAVENPORT. AMERICAN RESOURCES GROUP, LTD., CARBONDALE, IL. SUBMITTED TO POWER ENGINEERS, HAILEY, ID, & TOUCH AMERICA COMMUNICATIONS.
Site(s): 13IW262 - 13IW267, 13JH102, 13JP164 - 13JP166, 13MC226 - 13MC229, 13MD157, 13PH65 - 13PH68, 13ST185 - 13ST187

R&C Number: 020500105
HOLTZ-LEITH, WENDY K. AND DEAN WILDER
2002 RESULTS OF A PHASE 1 INTENSIVE ARCHAEOLOGICAL SURVEY OF A PROPOSED RURAL WATER PIPELINE ROUTE IN TAMA AND POWESHIEK COUNTIES, IOWA. REPORT OF INVESTIGATIONS 459. MISSISSIPPI VALLEY ARCHAEOLOGY CENTER, WISCONSIN-LA CROSSE, LA CROSSE, WI.
Site(s): no sites found

R&C Number: 030579034
LINDERBAUM, MATHEW A. AND DAVID G. STANLEY
2003 A PHASE 1 CULTURAL RESOURCES INVESTIGATION FOR THE DIAMOND LAKE RECREATIONAL TRAIL, JACKSON TOWNSHIP, POWESHIEK COUNTY, IOWA. BCA REPORT 1131. BEAR CREEK ARCHEOLOGY, INC., CRESCO, IA.
Site(s): 13PH71

R&C Number: 030579034
FINN, MICHAEL R.
2007 PHASE I INTENSIVE ARCHAEOLOGICAL SURVEY OF THE PROPOSED ADDITION TO THE DIAMOND LAKE CAMPGROUND, POWESHIEK COUNTY, IOWA. 315. WAPSI VALLEY ARCHAEOLOGY, INC., ANAMOSA, IOWA.
Site(s): no sites found

R&C Number: 030579034
MORROW, TOBY A. AND MARY E. HUERTER
2009 PHASE I INTENSIVE ARCHAEOLOGICAL SURVEY OF THE PROPOSED BIKE TRAIL IN DIAMOND LAKE PARK, POWESHIEK COUNTY, IOWA. 411. WAPSI VALLEY ARCHAEOLOGY, INC., ANAMOSA, IOWA.
Site(s): no sites found

R&C Number: 900700010
HUDAK, CURTIS M. and BRW, INC.
1990 PHASE I CULTURAL RESOURCE INVESTIGATION OF THE BURLINGTON TO DES MOINES HIGHWAY CORRIDOR: SECTION II IOWA COUNTIES, MAHASKA, WAPELLO, MONROE AND JEFFERSON DE-163-2(11)--2A-62, BRW, INC., MINNEAPOLIS, MN. SUBMITTED TO IOWA DEPARTMENT OF TRANSPORTATION, AMES, IA.
Site(s): 13MK124, 13MK125, 13MK243, 13MK294, 13MK295, 13MK303, 13MK320, 13WP31, 13WP303 - 13WP308, 13MI320, 13MK124, 13MK125, 13MK293 - 13MK295, 13MK303, 13WP31, 13WP303 - 13WP308

R&C Number: 890200104
STANLEY, DAVID G., R. C. VOGEL, L. D. ROGERS, D. W. BENN, J. R. SELLARS, T. E. ROBERTS, K. M. PRESLER
1991 CULTURAL RESOURCES INVESTIGATION OF DES MOINES TO BURLINGTON CORRIDOR, SECTION 1, JASPER, MARION, AND MAHASKA COUNTIES, IOWA. IOWA DOT PROJECT NO. DE-163-2(10)--2A-50. BCA REPORT 45. BEAR CREEK ARCHEOLOGY, INC., DECORAH, IA.
Site(s): 13JP95, 13MA488 - 13MA499, 13MK271 - 13MK302, 13MK325 - 13MK328

There have also been a number of previously recorded archaeological sites within the current study area in both Poweshiek and Mahaska counties (see Figures 10-12). Most of these sites were recorded and evaluated as part of highway and other construction project studies. However, some were recorded by local residents and avocational archaeologists and have never been evaluated for potential National Register eligibility. To date, no American Indian burials or mound sites have been recorded in the current study area, but this does not negate their presence. Any proposed corridor where it crosses major river and creek valleys would have some potential for burial sites, most often located on upland positions near the valleys. There are certainly Euroamerican burial grounds and cemeteries in the study area, and where known, their locations were pinpointed on project maps.

The following is a listing of the previously recorded archaeological sites in the study area obtained from I-Sites Pro (2012) (see also Figures 10-12):

Poweshiek County Previously Recorded Sites

Site No.	Site Type	NRHP Evaluation/Recommendation
13PH14	Prehistoric Scatter	No evaluation
13PH16	Prehistoric camp	No evaluation
13PH17	Prehistoric camp	No evaluation
13PH20	Prehistoric scatter	No evaluation
13PH21	Prehistoric scatter	No evaluation

13PH22	Prehistoric scatter; Historic dump	No evaluation
13PH23	Prehistoric scatter	No evaluation
13PH25	Prehistoric scatter	No evaluation
13PH26	Prehistoric scatter	Additional Phase I
13PH27	Prehistoric scatter	No evaluation
13PH28	Prehistoric scatter	Additional Phase I
13PH29	Prehistoric isolated find	No evaluation
13PH30	Prehistoric scatter	No evaluation
13PH31	Prehistoric scatter	No evaluation
13PH32	Prehistoric scatter	Additional Phase I
13PH33	Prehistoric find spot	No evaluation
13PH34	Prehistoric find spot	No evaluation
13PH35	Prehistoric camp	No evaluation
13PH36	Prehistoric isolated find	No evaluation
13PH58	Historic scatter	Not eligible
13PK61	Historic scatter	Not eligible
13PH62	Historic scatter	Not eligible
13PH63	Historic scatter	Not eligible
13PH64	Historic scatter	Not eligible
13PH69	Prehistoric isolated find	Not eligible
13PH71	Historic scatter	Not eligible
13PH77	Historic road/trail	Not eligible (but only a portion evaluated)
13PH78	Historic scatter	Not eligible
13PH184	Archaic-Woodland scatter (Parker Site)	No evaluation (based on private collection)
13PH185	Historic dump	Not eligible
13PH186	Historic road/trail	Not eligible
13PH187	Prehistoric open habitation	Not eligible
13PH188	Prehistoric open habitation	Not eligible
13PH189	Prehistoric open habitation	Not eligible
13PH190	Prehistoric isolated find	Not eligible
13PH191	Prehistoric isolated find	Not eligible
13PH192	Prehistoric scatter	Not eligible
13PH193	Prehistoric open habitation	Not eligible
13PH194	Prehistoric open habitation	Not eligible
13PH195	Historic farm/residence	Not eligible
13PH196	Prehistoric open habitation	Not eligible
13PH197	Prehistoric open habitation	Not eligible

Yellow highlighted site has very good potential to be considered eligible for the National Register of Historic Places based on current data.

Mahaska County Previously Recorded Sites

Site No.	Site Type	NRHP Evaluation/Recommendation
13MK35	Prehistoric scatter/camp	No evaluation
13MK43	Prehistoric habitation/workshop	No evaluation
13MK44	Prehistoric scatter	No evaluation
13MK45	Prehistoric workshop	No evaluation
13MK61	Prehistoric scatter	No evaluation
13MK62	Prehistoric isolated find	No evaluation
13MK67	Prehistoric isolated find	No evaluation

13MK68	Prehistoric isolated find	No evaluation
13MK69	Prehistoric isolated find	No evaluation
13MK70	Prehistoric scatter/camp	No evaluation
13MK71	Prehistoric scatter/camp	No evaluation
13MK72	Prehistoric isolated find	No evaluation
13MK74	Prehistoric open habitation	No evaluation
13MK225	Prehistoric camp	No evaluation
13MK226	Prehistoric camp	No evaluation
13MK227	Historic building remains	No evaluation
13MK228	Late Woodland isolated find	No evaluation
13MK237	Historic farm/residence	No evaluation
13MK254	Prehistoric camp	No evaluation
13MK261	Prehistoric camp	No evaluation
13MK263	Prehistoric find spot	No evaluation
13MK270	Prehistoric camp	No evaluation
13MK271	Historic farmstead	Not eligible
13MK273	Historic farmstead/Prehistoric resource procurement	Not eligible
13MK275	Historic farmstead	Not eligible
13MK276	Historic rural school	Not eligible
13MK277	Historic scatter/habitation	Potentially eligible/Phase II
13MK278	Historic rural school	No evaluation
13MK344	Historic/Late Woodland/Late Prehistoric habitation	Additional Phase I (Great Oasis)
13MK358	Historic farm/residence	Not eligible
13MK359	Historic farm/residence	Not eligible
13MK360	Historic farm/residence	Not eligible
13MK361	Historic farm/residence/Prehistoric scatter	Not eligible
13MK362	Prehistoric isolated find	Not evaluated/Field check
13MK363	Historic farm/residence	Not eligible
13MK365	Prehistoric/historic scatter	Undetermined/Field check
13MK367	Historic farm/residence	Not eligible
13MK368	Prehistoric/Historic scatter	Not eligible
13MK369	Historic School	Not eligible
13MK370	Prehistoric isolated find	Undetermined/Field check
13MK371	Historic farm/residence	Not eligible
13MK372	Historic farm/residence	Not eligible
13MK373	Historic farm/residence	Not eligible
13MK374	Historic scatter	Not eligible
13MK375	Prehistoric/Historic scatter	Not eligible
13MK376	Historic farm/residence	Not eligible
13MK377	Historic schoolhouse	Not eligible
13MK378	Prehistoric/Historic habitation	Not eligible
13MK379	Prehistoric/Historic scatter	Not eligible
13MK380	Prehistoric/Historic habitation	Not eligible (log cabin)
13MK381	Historic school (Farmersville)	Not eligible
13MK382	Historic post office/general store (Farmersville)	Not eligible
13MK383	Historic farm/residence	Not eligible
13MK384	Historic farm/residence (mid-19th century)	Potentially eligible/Phase II
13MK385	Early Archaic isolated find (projectile point)	Undetermined
13MK386	Historic farm/residence	Not eligible
13MK387	Historic farm/residence	Not eligible

13MK388	Historic farm/residence	Not eligible
13MK389	Prehistoric/Historic scatter	Undetermined
13MK390	Historic building remains	Not eligible
13MK395	Historic farm/residence	Not eligible
13MK398	Historic farm/residence	Not eligible
13MK409	Historic scatter/railroad related	Not eligible
13MK410	Woodland open habitation	Undetermined/Additional Phase I
13MK419	Prehistoric open habitation	Not eligible
13MK447	Historic scatter	Not eligible
13MK448	Historic scatter	Not eligible
13MK449	Historic farm/residence	Not eligible
13MK520	Historic farm/residence	Not evaluated (Archival - GLO)
13MK533	Historic farm/residence	Not evaluated (Archival - GLO)

Yellow highlighted sites are considered to have moderate to good potential to be considered eligible for the National Register of Historic Places based on current data.

Historical Background

Prior to this study, hundreds of archaeological sites in Poweshiek and Mahaska counties had been reported to the Office of the State Archaeologist (OSA) in Iowa City (I-Sites Pro 2012). These sites represent both prehistoric and historic period sites, with most of the prehistoric sites having only a general prehistoric identification. However, there have been a number of prehistoric sites further identified as having Archaic, Woodland, and Late Prehistoric temporal/cultural affiliations. The historic period sites include at least one Historic Indian burial site (outside of the current study area), with the majority associated with the Euro-American settlement of these counties. There is potential within the current study area to encounter archaeological sites associated with the full range of known human prehistory/history in Iowa, starting with the Paleoindian period and extending to the modern era.

Paleoindian Period

The Paleoindian Tradition (12,500-9,500 B.P.)[1] represents the earliest known human presence in Iowa. Paleoindian peoples appear to have been migratory bands of hunter-gatherers who spread rapidly across North America as the last of the massive glacial ice sheets retreated northward. By 12,500 B.P., Paleoindian peoples had migrated throughout Iowa in small mobile hunting bands following Pleistocene megafauna. The Paleoindian Tradition is generally subdivided into Early and Late periods. The material culture of the Early Paleoindian period is characterized by large-to-medium sized, fluted, lanceolate (leaf-shaped) points, such as Clovis and Folsom points. The Late Paleoindian period is characterized by non-fluted or basally-thinned lanceolate points, such as Agate Basin and Dalton points. These projectile points are distinctive in their fine workmanship across the continent and the high quality lithic raw material selected (Alex 2000; Morrow 1984; Morrow and Morrow 1996:47-48).

The Paleoindian Tradition is not well represented in Iowa. Only one Early Paleoindian site has been excavated in Iowa—the Rummels-Maske Site (13CD15), a Clovis cache site, which is situated along a tributary of the Cedar River in Cedar County (Anderson and Tiffany 1972:55). Most of the recorded sites represent surface finds, many reported by local residents and avocational archaeologists. It is considered that many yet to be discovered Paleoindian archaeological sites are deeply buried under thick alluvial deposits in the river valleys or within thick eolian loessial deposits in upland and high terrace or bench

[1] B.P. stands for years before present, with present being 1950.

locations. Most of the upland sites have been severely impacted by surface erosion as the result of intensive cultivation and other landmoving efforts during the historic and modern eras (Alex 2000:37-38). No Paleoindian sites have been reported to date in the whole of Poweshiek or Mahaska counties (I-Sites Pro 2012).

By 10,000 B.P., the Des Moines Lobe had retreated from Iowa and the Holocene epoch began. During the Holocene, different ecological zones emerged with different groups of people adapting to each ecological zone in Iowa and the Upper Midwest. The transition from a glacial climate to a post-glacial climate coincides with the mass extinction of the Pleistocene megafauna, a phenomenon possibly caused by "environmental change, disease, or predation by hunters leading to overkill—or a combination of all three" (Alex 2000:41). The changing environment, and cultural responses to this change, resulted in the period of human adaptation that archaeologists call the Archaic Period.

Archaic Period

The Archaic Tradition (10,500-2,350 B.P) is divided into three subperiods: Early, Middle, and Late Archaic. By the beginning of this period, loess deposition was waning and erosion began. Soil formation became the dominant force upon the landscape (Alex 2000:55). The Hypsithermal and the Altithermal (a time of warm-dry conditions) encouraged the northward and eastward expansion of prairie-grasses across the Midwest. The prairie expanded into western Iowa by 10,100 B.P. and made its way into eastern Iowa around 6,600 B.P. (Baker et al. 1990).

The Archaic peoples had a more diverse diet than their preceding Paleoindian ancestors. Their diet consisted of modern bison, deer, fish, waterfowl, other large and small mammals, and a variety of wild plants. Archaic peoples may have begun small-scale cultivation in Late Archaic times, and the widespread domestication of dogs may have occurred in North America at this time as well. Technological advances during the Archaic period include the use of groundstone tools for a variety of purposes such as bannerstones, full-grooved axes, gorgets, manos and metates, and plummets. Diagnostic artifacts from the Archaic period include lanceolate, medium-sized, stemmed projectile points as well as groundstone tools (Alex 2000:56-57).

Around 5,000 B.P., cooler temperatures and increased moisture caused the retreat of prairies westward, and the areas east and south in Iowa became more forested. Plants, especially nuts, became an important subsistence component during this period. The Old Copper Complex (Middle – Late Archaic) is the earliest evidence of metal-working in North America and is represented on archaeological sites in Allamakee, Clayton, and Winneshiek Counties in northeastern Iowa and surface finds in northwest Iowa (Alex 2000).

The Archaic period is better represented within Iowa, primarily because population density increased during this period over the previous Paleoindian period. The Archaic Period includes a variety of pre-ceramic material culture and site types. Archaic site types include: open camp and habitation sites, artifact caches, intentional burials, rockshelter habitation sites, plant and animal processing sites, and in some areas of Iowa, large bison kill sites (Alex 2000). The first evidence of intentional human burials in Iowa occurred during the Archaic period. Archaic sites have been recorded in Poweshiek and Mahaska counties and include sites: 13PH13, 13PH147, 13PH170, and 13PH184 in Poweshiek; and 13MK207, 13MK229, 13MK244, 13MK323, 13MK341, 13MK355, 13MK385, 13MK392, 13MK396, 13MK422, and 13MK426 in Mahaska (I-Sites Pro 2012).

Woodland Period

The Woodland Tradition (2,350-850 B.P.) encompasses most pottery cultures in the eastern half of the United States. It is marked by the construction of grit-tempered ceramic containers for the use of cultigens in horticulture and for the construction of earthen burial mounds. These innovations did not

occur at one time and were not adopted by all groups at the same time. The Woodland Tradition allowed for people to become sedentary than their Archaic ancestors (Alex 2000). This period is also subdivided into Early, Middle, and Late periods.

The Early Woodland period (2,350-2,050 B.P.) can be characterized as a transition from the Archaic lifeways and is defined by the use of ceramic containers and reliance on cultivated plants for subsistence.

The Middle Woodland period (2,050-1,550 B.P.) is a time of dramatic change marked by widespread trade associated with the Hopewell Interaction Sphere that peaked ca. 2,000 B.P. During this time, long distance trade flourished and large earthen mounds were built containing high status burials associated with exotic trade goods including: mica from West Virginia, pipestone from Ohio and Illinois, marine shell and shark teeth from the Gulf Coast, and obsidian from the Yellowstone region.

The Late Woodland period (1,550-850 B.P.) saw the introduction of the bow and arrow, an increase in the reliance on maize horticulture, the appearance of fortified villages, and the use of globular grit-tempered pottery. As a result of corn farming, this period experienced an increase in population but also a general decline in health. The best-known Late Woodland culture within the Upper Mississippi region is the Effigy Mound culture, which was characterized by animal-shaped earthenworks built in Illinois, northeastern Iowa, and Wisconsin (Alex 2000).

A number of sites with Woodland-age components have been identified in Poweshiek and Mahaska counties including sites: 13PH22, 13PH49, 13PH170, and 13PH184 in Poweshiek; and 13MK3, 13MK5, 13MK12-14, 13MK21, 13MK29, 13MK36, 13MK53, 13MK166, 13MK204, 13MK217, 13MK223, 13MK228-230, 13MK240, 13MK257, 13MK269, 13MK322, 13MK344, 13MK352, 13MK357, 13MK364, 13MK366, 13MK391, 13MK393, 13MK402-403, 13MK410, 13MK426, 13MK429, 13MK434, 13MK433, and 13MK564 in Mahaska (I-Sites Pro 2012).

Late Prehistoric Period

Late prehistoric traditions in Iowa (A.D. 950-1700) are represented by four cultures: Great Oasis, Mill Creek, Glenwood, and Oneota. All are typified by semi-permanent villages that were dependent upon maize horticulture but also included hunting, gathering, and foraging subsistence strategies. Great Oasis sites are concentrated in northwestern Iowa and along the Des Moines and Raccoon rivers in Central Iowa. Mill Creek sites are concentrated in northwestern Iowa. Glenwood sites are located in southwestern Iowa. Oneota sites are located statewide including a large cluster beginning south of Des Moines, Iowa (Alex 2000). One Great Oasis site has been reported in Mahaska County, specifically 13MK344 (I-Sites Pro 2012). *This site is within the current study area and was recommended for additional Phase I investigation if it was to be impacted.*

Proto-Historic/Early Historic Periods

The proto-historic and early historic periods (A.D. 1700 to 1840s) began as native cultures came into contact with Europeans and Euroamericans and/or their material culture. This contact brought dramatic shifts within the lifeways of the native populations. Disease, inter-native warfare, and a cold climatic regime known as the "Little Ice Age" led to the death of approximately 85-90% of native populations (Green 1993). [2] Two proto-historic sites have been reported in Mahaska County and include sites 13MK267 and 13MK448 (I-Sites Pro 2012).

A number of different American Indian groups may have lived in Iowa during the proto-historic to early historic periods (Alex 2000:211). These different groups included: the Ioway, Oto, Winnebago, Omaha, Ottawa, Huron, Miami, Kitchigami, Mascouten, Chippewa, Sauk, Meskwaki, Potawatomi, Pawnee, Santee, Yankton, Moingwena, and Peoria (ibid.). Historic Indian sites have been recorded in

[2] The "Little Ice Age" was a period where precipitation on the Great Plains was significantly greater and temperatures significantly lower than during the twentieth century (Bamforth 1990:259).

Poweshiek and Mahaska counties and include: 13PH51 and 13PH198 in Poweshiek; and 13MK28, 13MK97-99, 13MK132, and 13MK458 in Mahaska (I-Sites Pro 2012). Of particular interest is Kishkekosh's Village Site (designated as 13MK132), which was reported to consist of fifteen to twenty lodges on the banks of the Skunk River and occupied in the late fall of 1841. Three archaeological sites in Mahaska County (13MK97-99) have been recorded as Kishkekosh's Village cemetery. The burials were exhumed as they were eroding from the bluff overlooking the Skunk River. Recovered materials included: glass beads, a fragment of woven cloth with an attached silver brooch, and human remains (Gourley 1990:147). None of the sites recorded in Mahaska County with the proto-historic/early historic period are within the current study area.

French fur traders and explorers were the first European people to arrive in Iowa during the seventeenth and eighteenth centuries. The first recorded Europeans to set foot upon Iowa soil were James Marquette and Louis Joliet in 1673. A French fur trader named Michel Accault visited the Ioway at their village on the Upper Iowa River between 1677 and 1680 to establish trading ties. The fur trade with the French, and the introduction of the horse by the Spanish from the south caused more displacement among the native populations. As a result, a westward push by the European traders and eventually Euroamerican settlers forced American Indian groups to re-locate to areas on the Great Plains where they took advantage of fur bearing animals and intensified bison hunting (Alex 2000:216-220; Mott 1938).

The Louisiana Purchase of 1803 brought the area later known as Iowa under the direct control of the United States of America. Through a series of conflicts and the resulting purchase and treaties in the 1820s-1840s, the American Indians were progressively removed from the land that would become the State of Iowa. The first official land surveys were conducted by the General Land Office (GLO) and opened the way for legal lands sales to Euroamerican settlers. In Mahaska and Poweshiek counties, the GLO surveys were conducted in the 1840s.

While the main purpose of the GLO surveys was to set township and sections lines to facilitate land sales, the surveyors were allowed to map the locations of early settlements, such as log cabins and the first improved fields, trails and roads (some of which were American Indian trails), good mill sites, and other natural fields that might have economic value. Not all of the surveyors chose to map such features; therefore, the lack of cultural features on any given GLO map does not necessarily mean that there were no such features present at that time. Figures 13-15 are a graphic representation of the cultural features that were noted on the study area's GLO plats. The most common features mapped were the field plots that represented the first ground tilled by the prospective settlers in order to "prove up" their claims once land sales were opened. Getting a field cultivated often came before a permanent cabin or house, although some early cabins were depicted in the study area as well on these early plats. A few early trails or roads were also depicted in the study area on the GLO plats, with the area around Oskaloosa a seeming hub for early trails in the region (see Figures 14-15).

Post-1840 History of the Project Area

<u>Poweshiek County</u>

Poweshiek County was surveyed by the General Land Office in 1847 and was organized on April 3, 1848 (Parker 1911:84). The county was named after a Fox (Meskwaki) chief and means "roused bear" or "shedding bear" (Dilts 1993:25). Jackson Township was named after President Andrew Jackson and was organized April 15, 1848. It is the largest township in Poweshiek County and measures six miles (north to south) by eight miles (east to west). Gideon Wilson built the first house and opened a general merchandise store, which was also the first in the county (Parker 1911:228). Other early settlers in Jackson Township included: Jacob S. Dalby, John Hall, John Cassidy, Joshua Crisman, William H. Barnes, Jesse Lowry, Martin Snyder, O.P. Rundle, John Sargood, Robert Taylor, James W. Williams, David Cassidy, Jon Moor, John Sargood, Elias Brown, and Williams Butt. In 1848, original land entries

for the township included: William McVey, Gideon Wilson, William Hawkins, William Copplinger, Simeon Johnson, and Isaac G. Wilson. Land entries for 1849 included: William Harklerode, William H. Wilson, Benjamin O. Payne, James W. Wilson, A. Bryan, Martin Servell, Mary S. Legari, Jesse Soey, and Samuel McPheeters (ibid.:229). A small hamlet, Brownsville, was also located in Jackson Township. Brownsville was a short lived town.

The county seat, Montezuma, was surveyed and platted in July 1848. Gideon and Isaac G. Wilson were the first residents of Montezuma in the fall of 1848 and winter of 1848-9 (Union Historical 1880:508). The town of Montezuma was named after the famous Aztec ruler, Montezuma II. It was one of several place names brought to Iowa from Mexico after the Mexican-American War (Dilts 1993:132). As noted above, Gideon Wilson built a double log house at the northwest corner of the courthouse square and opened a general store in one room of the residence. Isaac G. Wilson built a log house in town soon after (Parker 1911:230).

Rev. James B. Johnson organized the Methodist Protestant Church in Montezuma in 1849. Also in 1849, Dr. H. Clay Sanford became the first physician to settle in Montezuma (Parker 1911:230). In 1851, the first frame schoolhouse was erected. Richard B. Ogden, the first settler in the county, became the first county judge in 1851 (ibid.:231). John McIntire settled in the county in 1849, and in 1854, he built a hotel called the Montezuma House. He later built a second hotel called the Stanley House. In 1855, McIntire built a steam grist mill. James W. Wilson settled in the county in 1848 and in 1851 was elected sheriff of Poweshiek County (ibid.:232). The first lawyer was Edwin F. Whitcomb in 1852 (Union Historical 1880:508).

In 1868, Montezuma was incorporated. The first post office in Poweshiek County was kept in the storehouse of Gideon Wilson and Isaac Wilson was the first postmaster. A portion of the first city hall was built in 1883 for a skating rink and opera house. The property was purchased by the city in 1893 and was remodeled in 1905. The Montezuma waterworks was erected in 1896. The paving of the streets in Montezuma was conducted in 1909 (Parker 1911:233). Two cemeteries are located in Montezuma: the I.O.O.F Cemetery laid out in 1864 and the Jackson Township Cemetery used for burial since 1857 (Union Historical 1880:513-4)

Malcom Township was organized in September 1858. The first settler of the township was W.L. Zink, who settled in 1853 in Section 14. Following Zink, W. Springer arrived in Malcolm Township in 1854, along with Church Meigs, P.P. Raymond, Edmond Cardell, and James Motherell. Christian Yaple arrived in 1855. John Wallace, James Clark, and Alexander Palmer arrived prior to 1856. Caleb Harvey arrived in 1859 (Parker 1911:261). The Rev. James Cox of the United Brethren congregation, and the Rev. A.D. Chapman, of the Presbyterian congregation, were the first ministers in the township (ibid.:261). Ivy Hill Cemetery (a.k.a. Malcom Cemetery or the Masonic I.O.O.F. Cemetery) was established in Malcom Township in Section 26 (Iagenweb 2012a).

The building of the Chicago, Rock Island, and Pacific Railroad in 1863 led Z.P. Wigton to build a town named Malcom in 1866 in Section 26. The first building erected here in 1866 was by W.J. Johnson. A railroad depot, elevator, and other buildings soon followed. Malcom became an incorporated town on April 23, 1872. The original Methodist Episcopal Church was built in 1875 and was destroyed by a tornado in 1882. Afterwards, a frame building was erected. In 1860, the Presbyterian Church was organized. The Evangelical Lutheran Trinity Church was erected in 1868 (Parker 1911:263-4).

A destructive fire broke out in the morning of May 6, 1877, on the east side of Main Street in Malcom. Three grocery stores, one furniture store, one hardware store, one meat market, one jewelry store, one dwelling, the town hall, and several other buildings were destroyed that day. Two saloons and one hotel were destroyed from a fire that broke out on June 6, 1879 (Union Historical 1880:624).

As late as 1880, the town of Malcom had a population of 500 people and included: two churches, one schoolhouse, one bank, one hotel, one post office, one depot, four large brick buildings, three general stores, one grocery, one hardware, two drug stores, one dry goods store, two blacksmiths, two wagon shops, one livery, one harness shop, one lumber yard, one grist mill, two grain elevators, one public hall, one cabinet shop, one bakery, one meat market, three dressmakers, and one telegraph office (Union

Historical 1880:623). The waterworks building was erected in 1895. The gas works was established in 1905. The high school building was erected in 1903 (Parker 1911:265-6).

The first settlers in Sugar Creek Township were William English, James McDowell, and Conrad Swaney, who arrived in 1846. The township was organized on July 3, 1848. The first election was held on April 2, 1849. James McDowell, R.F. Steele, and Nathaniel Lattimer served as judges; Charles B. Rigdon, township clerk; James McDowell, Thomas Rigdon, and Richard Cheeseman, trustees; Richard B. Ogden, treasurer; and E.J. Williams, township clerk (Parker 1911:271). James McDowell opened the first sawmill in the township in 1849, and John McIntire opened the first grist mill here in 1852 (ibid.:272). The first school was erected in 1851. Williams English was the first teacher and was also the first sheriff in Sugar Creek Township (ibid.). The Mill Grove Cemetery (a.k.a. the Moore or Stillwell Cemetery) is located in Section 25. The Mill Grove Post Office was south and east of Searsboro (Iagenweb 2012a).

Washington Township was organized in 1852 and was named after President George Washington. The early settlers of this township included: William McNabb, William Prosser, Sr., and Peter S. Pearce, who all arrived in 1848. In 1849, George M. Beeler, Robert C. Carpenter, Ephraim Stevens, James Stevens, and James Jenkins settled here. In 1852, additional settlers were William and Jesse Kenworthy (Parker 1911:282-283). The Methodist Episcopal Church was organized in 1852. The Society of Friend's (Quaker) Church was organized in 1856. The Blue Point Christian Church was organized in 1863. The first schoolhouse was erected in the early 1850s.

Union Township was first settled in 1843 by William and Thomas Curlin, but they soon returned to Illinois later that year. Richard B. Ogden arrived in Union township in October 1843. In the spring of 1844, Daniel and Joseph Satchell, Richard Cheeseman, and Peter Morgan settled here (Parker 1911:302). Other 1845 and early 1846 settlers of Union Township included: Richard Rivers, Allen R. Farmer, Elias Brown, Thomas Rigdon, the Woodward family, the Hall family, and the Newson family (ibid.:303). In 1847, William Butt settled here. Joseph Hall was another early settler. In the 1850s, settlers included: T.D. Smith, D.J. Evans, L.G. McCoy, L.A. Johnson, W.A. Bryan, W.W. Howard, Richard Bogarth, Thomas Ashing, F.F. McVey, Paschal Booze, William Beason, Hiram Colbreen, John Saunders, C. Wright, Samuel Sheeley, Snowden Myers, Isaac Myers, Nicholas H. Moore, Nicholas Kerr, John Sheeley, I.G. Dement, Aaron M. Saunders, John J. Rice, Hiram Whitney, William S. Saunders, A.J. Binegar, John James, Lemuel Hackney, and G.W. Hays (ibid.:304).

The Free Will schoolhouse was the first school built in Union Township in 1849 in Section 8 (Parker 1911:304). The Allen Cemetery is located in Section 20 of Union Township at 512 Avenue and 90th Street. It is reported that some stones from this cemetery were moved to the Forest Home Cemetery but the remains were left at their original location. The exact location of this cemetery is not known (Iagenweb 2012a). The Allen Cemetery was north of S.A. Allen's residence and was the first burying ground in Union Township (Union Historical 1880:585). The Beason Cemetery is located in Section 27 on land owned by William Beason (ibid.). Thirteen stones from this cemetery date to the 1850s. The Bone Cemetery (#1) is reportedly located in Section 10 but it is also reported that visible graves are located near a ski lift of the Fun Valley Ski Resort, which is in Section 15. A second Bone Cemetery was also reportedly located in Section 15 and had been laid out on Thomas McCoy's land. Neither of the "Bone" cemeteries is specifically located (Iagenweb 2012a).

Little Mount Baptist Cemetery is located in Section 8. The Little Mount Baptist Church also stood at this location but has since been removed. This cemetery was on R.F. Steele's land. It is reported that Gary John died at the age of 5 and is buried in an unmarked grave. The McDonald Cemetery is located in Section 9. Henry McDonald was the first burial in this cemetery having died on November 14, 1853. Two children are also buried at this cemetery. An unnamed cemetery is also located in Section 4, Union Township, near Lake Ponderosa. It is reported that a family had contracted Scarlet Fever and was buried in their yard. The house was subsequently burned down and the location may now be covered over by the lake (Iagenweb 2012a).

The Sheley Cemetery is located in section 34 on top of a hill, north and west of the site of Browntown (a.k.a. Brownsville) (Iagenweb 2012a; Union Historical 1880:585). Moses Saunders was buried in the Sheley Cemetery in 1851 (Iagenweb 2012a). It is also reported that there was a cemetery in Section 28 on a farm once owned by Dr. J.W. Smith in Section 28 and a cemetery on land owned by W.F. Hayes in Section 5 of Union Township (Union Historical 1880:585-6).

Forest Home was a small hamlet in Section 29, Union Township. The Methodist Church was organized here in 1844 followed by the Christian Church in 1847 and the Union Township Baptist Church in the summer of 1855 (Parker 1911:305). A post office was established in Forest Home prior to 1880. Forest Home had a population of 70-80 residents, but by 1880, the population had dropped to 26. Forest Home contained a store with a large trade but it burned prior to 1880. By 1880, Forest Home contained a post office, a Methodist Episcopal Church, a school house, a blacksmith shop, a store, and several residences (Union Historical 1880:584). The Forest Home Cemetery is located in Section 29 and is the largest cemetery in Union township. It was laid out in 1859 on land owned by Irvin Farmer and Elias Williams (Iagenweb 2012a).

Pleasant Township was organized on March 1, 1858. Early settlers of this township included: Hannibal Sutton in 1855 in Section 27; Alexander Palmer in Section 16; George Burns in Section 10 in 1854; John Cassidy in the early 1850s in section 21; and Amos Gregson in Section 30 in 1852 (Parker 1911:305-6). The small town of Ewart was situated along the Grinnell & Montezuma Railroad. The town was named after, and laid out by, the Ewart Brothers in December 1875. In 1875, L.H. Harris, erected the first building in Ewart (ibid.:306). A.B. Woods erected the first business building here in the spring of 1876 (Parker 1911:306; Union Historical 1880:632). Subsequent buildings soon followed, including an elevator. B.N. Warren was the first blacksmith. The first physician in Ewart was Dr. W.B. Cotton in 1880 (ibid.:306). The United Presbyterian Church was dedicated on September 4, 1876. This church burned to the ground in 1902 but was soon replaced. There was also a Methodist Episcopal Church in Ewart (ibid.:307).

Scott Township was named after Winfield Scott and was organized on June 6, 1861 (Parker 1911:339-340). Neri Scott was the first settler in Scott Township in Section 31 in the early 1850s. Other settlers in the 1850s included: Dennis Bryan, John K. Rayburn, John Early, Eli Shook, J.B. Buttles, Matthew Hardin, William Menlo, and John Shearer. Settlers coming in the 1860s included: R.S. Willett, George Willett, Addison Bone, D.J. Evans, Robert Shannon, Mr. Lytle, and George Shipley.

Bear Creek Township was organized in April, 1848. John J. Talbott was already living in what became known as Bear Creek and was also the first person to die in the township on February 20, 1849. Mr. Talbott was buried in Section 13. The first post office was located at the home of the widow of Mr. Talbott. A son, Joshua Talbott, was the first postmaster. The second settler of the township was Robert Manatt, who settled with his family here in 1849. The town of Brooklyn was laid out in spring 1849 by James Manatt (Parker 1911). Brooklyn is located outside of the current study area.

Mahaska County

The survey of the township lines for Adams Township in Mahaska County was made by William and Alvin Burt in July and August, 1843, and was re-surveyed by Deputy-Surveyor Stiles S. Carpenter in October 1847. Adams Township was originally part of Monroe Township but was subsequently detached from Monroe. A. Ruby and Jos. Davenport were the first settlers in Adams Township. A post office was established at Comet in 1877, with Stephen Criss as the postmaster. The first justice of the peace was Matthew P. Crowder. The first school was taught by A.N. Atwood at the home of Squire Crowder. The Centenary M.E. Church was built in 1863. The North River Baptist Church was built in 1864 (Union Historical 1878:535-6).

Madison Township was first surveyed by William Burt in August, 1843. The early settlers in this township included: Enoch Shoemake, William Goodplaster, John Padget, William Brummel, and Samuel Coffin. In the fall of 1846, a log school house was built with William Lawrence as the first teacher

(Union Historical 1878:536). A second school was later taught at a house on a farm owned by Milton Padget. The "Upper Mill" was located along the Skunk River and was built by Russell Peck and George Duncan in the summer of 1843. In 1858, the mill passed into the hands of the Braden Brothers and was later owned by Whitmore and Anderson. The mill contained three runs of stone and could grind 300 bushels a day. A railroad stop called Lacey was located on the Central Railroad and afforded good shipping facilities for the area farmers (ibid.:537). Farmersville was also another hamlet that contained a post office but was a short lived settlement.

The survey of the township lines for Union Township in Mahaska County was made by Alvin Burt in July, 1843. The early settlers in this township included: John Morrison, Nathan Brown, John Widows, Jacob Dalby, Isaac N. Griffith, the Bradshaws, Jacob Klinker, John Graham, Jesse Moon, Robert Telford, John Deardorf, Daniel Rodgers, John McMaines, Benjamin Groves, Anderson James, Fred Weimer, and others. The first lands purchased from the government included: Simeon Johnson, Section 1, October 9, 1848; R.B. Ogden, Section 4, October 9, 1848; Joshua Gorsuch, Section 11, October 9, 1848; and Robert Telford, Section 12, October 9, 1848. The first log school house with Mrs. Fry as teacher was located in Section 11 (Union Historical 1878:541). A post office was located at a small hamlet called Middletown, located between Oskaloosa and Montezuma in 1855. Pleasant Carver was the first post master (ibid.:542).

The Union Mills were originally located on the north side of the Skunk River in Union Township, but by 1878, had fallen into disrepair. In 1872, a man named Kaggy, started building a new mill but passed away before completing the mill. J. W. Braden was to build a dam at this location in 1878. About 1864, the Methodists built a frame building for a church, but never organized the church. In 1872, a Christian Church purchased the building. In the northern part of the township was organized a Methodist Episcopal Church at Bethel Grove. About 1868, a Protestant Methodist Church was organized at Brooks' schoolhouse, and about 1878 built a church building at Browntown (a.k.a. Brownsville). The Fairview M.E. Church was built in Union Mills in 1872 in Section 33 (ibid.:542). The Gorsuch (a.k.a. Browntown) Cemetery was located in Section 2, and the Union Mills Cemetery was located in Section 27.

Originally a part of Madison Township, Prairie Township was organized in 1856 (Union Historical 1878:542). The first settler of Prairie Township was John Hiler in 1844 in Section 3. In 1845, a man named Wallace settled in Section 4. In 1847, Alexander Stewart settled in Section 3. A.C. Doze settled in Section 12 on June 1, 1848. Jacob Bartlett settled in Section 29 in 1848 (ibid.:545). The largest town in Prairie Township is New Sharon. On August 25, 1856, John Michener, William Zimmerman, J.C. Culbertson, and Morgan Reno laid out New Sharon (ibid.:502). William Zimmerman wanted to name the new town Schenefell, German for "pretty field," but the other founding fathers did not like the sound of the name. Instead, the settlers selected "New Sharon," after the place name described in the Bible as Sharon located in the Palestinian Plains (Dilts 1993:141).

The first dwelling in New Sharon was built by Edward Quaintance and became a part of a hotel called "Central House" (Union Historical 1878:501-2). The first store was erected by James Winder in the spring of 1857. About the same time, Winder also erected a frame dwelling. In 1858, Ellsworth Draper built the third dwelling in New Sharon, soon followed by a fourth built by David Michener. The first house of worship was the Friends meeting house about 1866. James Winder was the first postmaster (ibid.:502). The first public school in New Sharon was erected in 1860. The town of New Sharon was incorporated in 1871. Two cemeteries are located in New Sharon: the Friends Cemetery and the Masonic (or Highland) Cemetery.

Garfield Township was created from Oskaloosa Township in 1882. It was named after President James A. Garfield. Robert Seevers, one of the early pioneers to Garfield Township, introduced Merino sheep and also brought shorthorn cattle to this county. Other early settlers included: Henry Prine, S.L. Pomeroy, and W.T. Smith (Iagenweb 2012b). Two cemeteries are located in Garfield: the Prine Cemetery and Garfield Cemetery.

Lincoln Township is named after President Abraham Lincoln and includes areas north and outside of the city of Oskaloosa. Lincoln Township is the smallest township in Mahaska County (Iagenweb 2012b).

The survey of the township lines for Oskaloosa Township in Mahaska County was made by William and Alvin Burt in the summer of 1843, and was completed by George Wilson in January 1845. The largest town in Oskaloosa Township (later called Lincoln Township) is Oskaloosa (Union Historical 1878:532).

The town of Oskaloosa is named after a Creek Princess, who was taken prisoner when the Creek were at war with the Seminoles. The princess eventually became the wife of Osceola, the Seminole leader, and was given the name Ouscaloosa, meaning, "the last of the beautiful" (Dilts 1993:146). The first dwelling built in the town plat of Oskaloosa was by D. Canfield, in the spring of 1844. Smith and Cameron started in the first store in 1844. G.W. Jones started the second store. William B. Street erected the first frame building on the west side of the town square. Samuel Gossage arrived in 1844 and became the proprietor of the National House. M.T. Williams settled here in May, 1844. Drs. Weatherford and Porter located to Oskaloosa in 1844 and were the first physicians in Oskaloosa (Union Historical 1878:455).

Three sites were originally under consideration for the county seat of Mahaska County. In Iowa, most county seats are centrally located in their counties. Centrality was important in the era of horse-drawn transportation, for farmers from all over the county wanted to be able to reach the county seat to conduct business and to return home in time for dinner and evening chores (Beving Long and Henning 1990:4-35). One choice was Auburn, a settlement on the Des Moines River. Auburn was named a post office in 1845; however, it was not located in the center of the county. The second location, in Madison Township, had the benefit of being centrally located in the county but was believed to be inaccessible and therefore a bad location. The third location was Oskaloosa (ibid.:4-40). Oskaloosa eventually became the official county seat in 1844.

By 1850, settlement of Oskaloosa had grown steadily and included the following general stores: Street Bros., William S. Dart, E. Perkins, and Phillips & Moreland. Dry goods businesses included: H. Temple & Co., Jones & Young; tailors included: M. Baldwin, James S. Chew, P.C. Camplied, and Currier & Co.; boots and shoes included: Wise & Mathews, and J.M. Whitney; saddlers: W.S. Edgar; Eagle Hotel; Jeweler: G.F. Sandler & Co.; wagon-maker: T.W. Rodgers; Gunsmiths: T. Shriver & Co.; Stoves and Tinware: B. Goodrich; and furniture: B.T. Pirkey. The principal lawyers were: M.T. Williams, J.A.L. Crookham, William T. Smith, John R. Needham, William H. Seevers, Eastman & Skiff, and A.M. Cassidy. The physicians in Oskaloosa included: C.G. Owen, N. Henton, A. Barker, E.W. Hyde, and W. Weatherford. Oskaloosa was incorporated on July 2, 1853 (Union Historical 1878:458-460). By 1878, Oskaloosa was served by three railroads: the Central Railroad of Iowa; the Chicago, Rock Island & Pacific Railroad; and the Keokuk and Des Moines Railway. The three railroads provided a unique opportunity for the shipment of affordable coal and freight to other parts of the Midwest, including Minnesota and Chicago (ibid.:459).

The first hotel was the "Canfield House" and was kept by William D. Canfield. The second hotel was the "Oskaloosa House." Both hotels were non-extant by 1878. In 1856-7, the "Needham House" was built by David Needham, located one block south of the public square (Union Historical 1878:470). In 1856, Major F.L. Downing purchased the "Madison House" and later changed its name to the "Downing House." The Downing House was located on the east side of the public square. This hotel was torn down in 1874 and was replaced by a new hotel also called the "Downing House" (ibid.:473).

Several mills were located around Oskaloosa in 1878. In 1851, Roop, Harbour & Co. built a grist mill, which by 1852 was used as a grist mill and distillery. Mr. Roop built another mill in 1857, and by 1878, it was used in connection with the distillery and whiskey refinery. These buildings were sold to Messrs. Hambleton and McCurdy, who converted the distilleries into woolen mills. These buildings later changed hands to Siebel & Co. in 1866 (Union Historical 1878:473). These gentlemen had three buildings for the milling operations including a grist mill, a woolen mill, and a warehouse. The grist mill was a three-story frame building and contained three pairs of burrs able to grind about two hundred bushels of wheat per day (ibid.:474).

The first public school taught in the vicinity of Oskaloosa was located about two miles east of the public square and began in 1844. The first school house was built in 1870 (Union Historical 1878:474).

In September of 1861, professors G.T. and W.J. Carpenter, affiliated with the Church of Christ, opened Oskaloosa College, with five students first enrolled. The "immortal five, as they were to be known, included: George Wilson, James Brown, Jennie Coarse, Jennie McCall, and Maggie Stevens" (ibid.:479-80). In September of 1873, Iowa Union College Association of Friends was opened in the northern part of Oskaloosa. This was a private college started by the Society of Friends (Quakers) and the name was changed to Penn College later that year. The enrollment for the first year was 219 students. The main building was erected in 1875 at a cost of $37,000. The first graduating class was in 1875 (ibid.:474-5).

Several churches were organized in the early history of Oskaloosa. The Cumberland Presbyterian Church was organized on November 10, 1844, by Rev. B.B. Bonham. This church was erected in 1846 (Union Historical 1878:481). The Methodist Episcopal Church was organized in the fall of 1844 by Rev. A.W. Johnson. A small log cabin was built in 1844 for the purposed of worship. In 1853, a brick house of worship was erected to replace the log cabin (ibid.:482). The Congregational Church was organized by F.W. McCall in 1844. The Rev. W.O. Westervelt became pastor of the church in 1852. The worshippers practiced their faith at Union Hall prior to the erection of their house of worship in 1857 (ibid.:483). The First Presbyterian Church of Oskaloosa was organized on February 21, 1845, by Rev. Samuel Cowles, a missionary. In 1848, it was decided to erect a house of worship but was not completed until 1855 (ibid.:484). The Church of Christ was organized by H.H. Hendrix on March 25, 1846. A church was not erected until after the first building was constructed at Oskaloosa College in 1861 (ibid.:486). The First United Presbyterian Church was organized on June 17, 1849, by Rev. J.C. Porter. In 1851, Rev. Fee became the first pastor of the congregation, and a church was erected later that year (ibid.:486-7). The St. James Episcopal Church was organized on May 27, 1855 by Rev. E.W. Peet. A church was built in the summer of 1869 on Market Street. The Oskaloosa Baptist Church was organized in December 1855, with a church erected in spring 1858 (ibid.:488-91). The Simpson Methodist Episcopal Church was organized in September 1868. A church was dedicated in 1872 (ibid.:491-2). The Universalist Church was organized in the fall of 1850 by Thomas Ballinger (ibid.:492).

The first banking house of Oskaloosa was opened by W.T. Smith and M.T. Williams on March 1, 1855, under the name of Smith & Williams (Union Historical 1878:492). A post office was organized in the summer of 1844, with Perry L. Crosman as the postmaster. The post office was located inside Jones' Grocery. About 1846, a stage line was established, and there was mail delivery three times a week and then eventually once a day (ibid.:495).

Coal Mining

Iowa was the second state west of the Mississippi River to develop coal mining for commercial purposes, after the discovery of coal in Missouri. The first written record of coal deposits in Iowa came from the United State Geological Survey in 1835 when a team descended the Mississippi River between Dubuque and St. Louis. During this survey, bituminous coal deposits were recorded on both sides of the Mississippi River. In 1836, Lieutenant Albert Lea was sent by the federal government to investigate the newly acquired Black Hawk Purchase. In his report, Lea documented large coal deposits along the Des Moines River near the Raccoon Fork. The earliest history of coal mining in Iowa began in the eastern part of Iowa in Muscatine, and Scott Counties along Pennsylvanian-age bedrock exposures associated with thin coal seams for local home heating purposes. Other small mines operated in southeastern Iowa in Jefferson, Lee, and Van Buren Counties. The first operational coal mine was operated at Farmington, Van Buren County in 1840 by Samuel Knight (Anderson 1998:251-252; Keyes 1913:104; Olin 1965:27, 80; Schwieder 1983:ix).

Between 1840 and 1870, the demand for Iowa coal was limited to a few mining operations producing for home heating purposes along exposed outcrops of Pennsylvanian coal. People still preferred wood for heating because of its cleanliness and availability. People were reluctant to use Iowa bituminous coal because of the high sulfur and ash content and when burned it was relatively dirty, dusty,

smoky, and produced clinkers. Most of the mines in eastern Iowa provided fuel for heating homes and businesses or provided fuel for riverboat transportation (Anderson 1998:252; Schwieder 1983:x).

By 1870, most of the major railroad systems and tracks in Iowa were in place to the Missouri River. In 1867, the Chicago and North Western Railroad companies completed their lines to Council Bluffs. Two years later, the Rock Island and Burlington railroad companies also finished their railroad tracks to Council Bluffs. In 1870, the Illinois Central Railroad reached Sioux City. The development of the railroad transportation systems greatly increased the demand for coal-based locomotives and Iowa coal was the westernmost supply for the railroad systems. Iowa was the leading producer of coal west of the Mississippi River until the coalfields of Colorado were developed. As a result, the need and supply for Iowa coal increased and after agriculture, coal mining was the second leading economic industry in Iowa (Anderson 1998:252; Olin 1965:27; Schwieder 1983:xi).

Poweshiek County lies at the extreme eastern edge of the Iowa coal field (Keyes 1894:300). The coal-bearing Cherokee Group is present in the southern and southwestern parts of Poweshiek County (Landis 1965:66). Mining in Poweshiek County dates back at least 1868 when Smith and Barrowman opened a mine along Buck Creek in Union Township about six miles southeast of Searsboro. Although the outcrop of coal was only eight inches thick, a drift was carried into the hill for distance of 150 feet (Keyes 1894:301). The Petit Mine, located on the south side of the Skunk River, was a drift mine with a vein sixteen inches in thickness (ibid.:302). The coal mined from the Petit Mine was used for local purposes only. By 1909, it is reported that the Petit Mine had been closed for some time (Stookey 1910:264). A short distance west from this mine was the Watson Drift Mine. Other small drifts have also been reported in a ravine a short distance from the Skunk River. Traces of coal have also been reported a short distance south of Montezuma in the vicinity of Deep River (Keyes 1894:302).

Coal mining in Mahaska County dates back to 1843 when Mr. Morgan began working a four-foot bed of coal in the bluffs on Muchakinock Creek, three miles from Eddyville. In 1853, Robert Seevers opened a mine east of Oskaloosa (Lees 1909:556). Mahaska County soon ranked as one of the leading coal producers in the state until 1901 when Polk and Monroe County surpassed Mahaska in annual tonnage (ibid.:560). As late as 1895, thirty mines were in operation in this section of the state with outputs of 200 to 1,000 tons per day (Bain 1895:351-2). Five localities or coal mining districts in the region include those in the North Skunk Valley, the South Skunk Valley, the Oskaloosa District, Muchakinock Valley, and Southwest Mahaska (Keyes 1894:342-54). Of these, the South Skunk Valley, Muchakinock Valley, and Southwest Mahaska districts are located outside of the current study area. The most productive coal mining locality was in the Muchakinock Valley (Bain 1895:365).

The North Skunk Valley district is located in the northern part of the county, northeast of New Sharon, along Buck Creek. The thickness of coal varies from 2.5 to 7.5 feet. The mines located within this district were slope and shaft mines (Keyes 1894:342-4). The biggest coal mines within the current study area included the following: James Roberts Mine (slope mine), Jacob Heightsman Mine (shaft mine), Hugh Smith Mine (slope mine), Williams Mine (x2, slope mines), Buck Creek Coal Mine (shaft mine), Duffus Mine (slope mine), Evans Coal Company Mine (slope mine), W.E. Evans Coal Mine (slope mine), W.F. Williams No. 3 (slope), William Williams Coal Company Mine (shaft mine), Fisher Mine (slope mine), Williams Brothers Mine (shaft mine), Robert Evans Coal Company Mine (slope mine), and several small coal mines with no names (I-Sites Pro 2012).

The Oskaloosa District mining area is located around the county seat of Mahaska County. The coal outcrops in the banks of creeks and was opened by means of drifts for local and regional use (Keyes 1894:345). The biggest coal mines within the current study area in this district include the following: Defrehn & Son Coal Company Mine (slope mine), Davis Coal Company Mine (slope mine), Acme Coal Company Mine No. 1 (shaft mine), Standard Mine (unknown type), and several small mines that do not have names (I-Sites Pro 2012).

Many of the region's underground coal mines were surface or strip mined in the twentieth century. However, some historic features such as shaft openings and surface structures and/or features once associated with the historic mining operations could remain in the study area.

Religious and Ethnic Settlement

Notable Religious Settlement in Mahaska and Poweshiek Counties

While a number of religious groups settled in the Mahaska/Poweshiek counties study area, two notable groups are worthy of mention as they may be relate to potentially significant cultural resources. Specifically, these groups are the Congregationalists, who concentrated in the Grinnell vicinity, and the Quakers (Society of Friends), who made more dispersed settlements in this area in the mid-nineteenth century. Both groups "were especially active in the abolitionist crusade and in supporting the underground railroad" (Schwieder 2008:8). Their participation in the Underground Railroad in the two-county area may be associated with historic sites (archaeological and/or architectural) yet to be identified in the study area.

The Underground Railroad was a loose network of sympathetic individuals and groups of individuals that were willing to risk life and liberty to assist fugitive slaves as they headed for free states and Canada. On September 18, 1850, the United Sates Congress passed the Fugitive Slave Act of 1850. This law required that the federal government aid in returning escaped slaves and to punish those individuals who assist in the escapement of slaves. Nevertheless, a number of Iowa's earliest settlers, often motivated by religious convictions, provided shelter, transport, and materials support to individuals who were seeking their freedom. Few standing structures remain of the Underground Railroad. However, some of the few standing stations include: the Todd House, Tabor; the George B. Hitchcock House, Lewis vicinity; the Henderson Lewelling House, Salem, and the James C. Jordan House, West Des Moines (SHSI 2012a).

Poweshiek and Mahaska counties had active routes of the Underground Railroad. Grinnell and Brooklyn were primary stops in Poweshiek County. Oskaloosa, Fremont, and New Sharon were primary stops in Mahaska County. Underground Railroad stations were often located around large populations of Congregationalists and Quakers. The actual networks of transferring individuals through this area are poorly known. However, some trails are known, such as the John Brown Freedom Trail of 1859, which traversed Iowa from Civil Bend, near Nebraska City, Nebraska, to Davenport and passing through Grinnell (SHSI 2012b).

The State Historical Society of Iowa (SHSI) has been conducting a historical study of the Underground Railroad (UGRR) in Iowa's history including an inventory of known or potential sites and persons associated with anti-slavery activities in the state. The following is a preliminary list of the inventories from Mahaska and Poweshiek counties provided by Douglas Jones of the SHSI:

Mahaska County Abolitionists
Baugh, George (Oskaloosa)
Howard, Henry (Oskaloosa)
Hunter, William A. (Oskaloosa Township)
McAyael, Rev. Robert A. (Oskaloosa, Presbyterian)
Morgan, David ? (Oskaloosa Township)
Rogers, Alexander M. (Oskaloosa, Presbyterian)
Scott, Silas (Oskaloosa Township)
Williams, Andrew C. (Oskaloosa Township)
Williams, John C. (Oskaloosa)
Young, J. E. (Oskaloosa)

Mahaska County UGRR Conductors/Station Agents
Boyd, James (Oskaloosa)
Dennis, Rev. L. D, (?)
English, Alpha (Fremont)

Gruwell, Dr. J. P. (Oskaloosa)
Hoag, Joseph D. (Oskaloosa)
Hockett, I. (Fremont)
Jones, Joseph (Oskaloosa)
Kimberly, Rev. William (Indianapolis, Adams Township)
McCormick, Matthew (Fremont Vicinity)
Montgomery, William. (Fremont)
Sopher, William Kenworthy (Oskaloosa Vicinity, Spring Creek Township)
Stanton, Borden (New Sharon)
Stanton, James ? (New Sharon)
Thompson, Judge Samuel (Oskaloosa)

Poweshiek County UGRR Places
S. N. Bartlett House
Brooklyn
Congregational Church (Grinnell)
Grinnell College (Grinnell)
The Reed House (Grinnell)

Poweshiek County Abolitionists
Bixby, Sarah H. (Grinnell)
Conaway, Dr. John (Brooklyn)

Poweshiek County Anti-Abolitionists
Clark, Capt. Nathaniel Winslow (Grinnell)
Cooper, Samuel "Scotch" (Grinnell)

Poweshiek County Freedom Seekers
"Four Black Men" (names unknown)
Craig, George
Overton, Frances
Thompson, Clark
Thompson, Dennis

Poweshiek County UGRR Conductors/Station Agents
Bailey, James F. (Grinnell)
Bixby, Amos (Grinnell)
Bliss, Harvey (Grinnell)
Brande, Elder T. (Grinnell)
Cooper, Samuel F. (Grinnell)
Grinnell, Josiah B. (Grinnell)
Griffith, Isaac Newton (Montezuma)
Hamlin, Rev. Homer (Grinnell)
Harris family (Grinnell)
Hill, Gershem H. (Grinnell)
Newkirk, Shipman (Brooklyn)
Parker, Prof. Leonard Fletcher (Grinnell)
Parks, Philo (Grinnell)

The homes, farmsteads, businesses, churches/meetinghouses, schools, and other properties associated with these persons could be significant if the properties or sites retain good integrity or at least good integrity of association with UGRR and other anti-slavery activities. These properties could be archaeological and/or architectural in nature.

Ethnic Settlements in Mahaska and Poweshiek Counties

The majority of settlers in the two-county area were American-born and migrated to this area in the mid- to late nineteenth century as part of the general westward movement of population during this period. Most of the earliest settlers hailed from Ohio, Indiana, Pennsylvania, Kentucky, Tennessee, Virginia, New York, Illinois, and various New England states (BRW, Inc. 1990; Parker 1911).

There were some notable ethnic groups represented in the study area vicinity. Some of the large Dutch immigrant settlement in neighboring Marion County (centered on the town of Pella) extended into northwestern Mahaska County in the nineteenth century. The coal mines in Mahaska County also employed foreign immigrants, most notably Welsh miners. Additionally, some of the coal mines in the county employed African Americans (BRW, Inc. 1990). The mining town of Muchakinock in Harrison Township in southern Mahaska County was populated by African American miners in the late nineteenth century. Southwest of Oskaloosa just over the county line in Monroe County was the coal mining town of Buxton, which was largely an African American mining town in the early twentieth century (Gradwohl and Osborn 1990).[3]

Railroads

One of the most important land-altering construction activities was the construction of the railroad in Iowa. While the railroad transported people and goods from one community to another, the railroad in Iowa was primarily for the transportation of coal and grain. In 1848, railroad fever hit Iowa. As the eastern portion of the state was more populated than the central or eastern portions of the state, the eastern portion of Iowa saw the emergence of the railroad before other portions of the state. A north-south railroad route connecting Keokuk and Dubuque was the first railroad constructed. Soon, east-west railroads were later constructed. Areas with the railroad saw increased commercial success as well as competition from neighboring communities. The railroad also established railroad stops along the lines, further altering the landscape (Beving Long and Henning 1990:4-46).

There were two main railroads within the current study area. The Chicago, Rock Island and Pacific Railroad came to Poweshiek County in 1862 (Parker 1911:246). This line connected Grinnell to Malcom and Brooklyn. The Chicago, Rock Island & Pacific Railroad later became the Chicago and Northwestern Railroad (Andreas 1875; Hixon 1930a; Malcom 1975 7.5' quadrangle; Midland Map 1905; New Sharon Star 1922). The second mail railroad was in Mahaska County. In 1864, a Quaker named David Morgan formed an incorporation called the Central Iowa Railroad. Its headquarters was located in Oskaloosa, but the company was organized at New Sharon on January 5, 1865. On February 2, 1871, the last railroad spike was driven and the railroad line was completed from Albia to Mason City (Union Historical 1878:347). This railroad extends from Oskaloosa to New Sharon and Grinnell. The Central Iowa Railroad later became the Minneapolis & St. Louis Railroad and still later became the Chicago & Northwestern Railroad. Yet later, it became part of the Chicago, Rock Island & Pacific Railroad system (Andreas 1875; Grinnell Herald 1928; Hixon 1930b; Kenyon 1914; Midland Map 1921; Ogle 1896).

Older post villages thrived as social and market centers in township-based farming communities but they slowly died when the railroads channeled most economic activities into the towns and urban centers

[3] In fact, the mine at Buxton was established by the same company that founded Muchakinock and represented the moving of that company from one mine to the next after the first (at Muchakinock) had played out (BRW, Inc. 1990).

along their routes. At the same time, railroads created opportunities for new towns to thrive. The remnants of two such railroad-born towns are located within the study area: the Town of Ewart in Pleasant Township, Poweshiek County, and the Town of Lacey on the Madison-Adams Township line in Mahaska County. Both of these railroad towns were established by prominent individuals in each county's history.

Ewart was laid out by the Ewart Brothers (successful livestock farmers in Pleasant Township) along the line of the Grinnell and Montezuma Railroad (later the Iowa Central Railway) in 1875. Lacey was platted by John F. Lacey, the eight-term U.S. Representative from Oskaloosa (Ewart Story 2012; DeWitt 1950). Evans, another railroad-born town is located just west of Oskaloosa in Garfield Township on the now abandoned line of the Chicago Rock Island & Pacific Railroad (see Coal Mining section).[4]

Assessment Results

Previously Recorded Archaeological Sites

There are currently no archaeological sites in the two-county study area that have been listed in the National Register of Historic Places. Of the 42 previously recorded sites in the study area portion of Poweshiek County, only 22 have been evaluated as ineligible for the National Register. Seventeen of the sites have no evaluation, with three other sites recommended for additional Phase I in order to determine if potentially eligible. One of the unevaluated sites, 13PH184, is a large multi-component Archaic-Woodland site that is likely potentially eligible for the National Register because of its large size and the density of material collected by the Parker family and others from this site. The site is in the uplands and may have been impacted by erosion and cultivation to the point that it does not possess sufficient integrity to be considered National Register eligible; however, it will require full Phase I and potentially Phase II testing to make a final determination of either eligibility or ineligibility. This site straddles the western boundary of the current study area on the west side of Highway 146 southeast of Searsboro (see Figure 11). It is situated along the edge of one of the potential road improvement corridors for the U.S. Highway 63 project (see Figure 1).

Of the 70 previously recorded archaeological sites in the study area portion of Mahaska County, 36 sites have been evaluated as ineligible for the National Register. Thirty-one sites have no evaluation (listed either as no evaluation or status undetermined), with three sites evaluated as potentially eligible. Sites 13MK277 (a historic site), 13MK344 (a multi-component historic/prehistoric site including a Late Prehistoric Great Oasis component), 13MK384 (mid-19th century historic site), 13MK385 (an Early Archaic isolated find), 13MK410 (a Woodland open habitation site), 13MK520 (a historic GLO-mapped cabin site), and 13MK533 (also a GLO-mapped cabin site), are highlighted as potentially significant sites that would require additional Phase I and/or Phase II testing in order to make a final determination of eligibility or ineligibility for the National Register (see Figures 10-12).

In general, the previously recorded sites that have received no evaluation could be found to be significant upon further field investigation; however, those sites, which have been investigated sufficiently and determined to be not eligible for the National Register, would warrant no additional archaeological investigation.

Furthermore, it should be considered that the majority of the current study area has not been systematically surveyed for archaeological resources; therefore, new sites will likely be encountered within any of the project corridors selected for intensive Phase I investigation.

[4] Evans is located just outside of the current study area.

Prehistoric Site Potential of Study Area

Prehistoric site potential of the current study area is generally moderate to high, with the highest potential being within the creek and river valleys and the upland valley margins. Site density typically drops with distance from reliable water sources; however, trail routes along upland divides will likely have camp sites and isolated finds along these early routes.

Sites in upland positions in locations that have been subjected to intensive cultivation in the historic and modern eras will likely have impacted integrity, often to the point that the site deposits are confined to the plow zone of a location. Sites found in such situations are unlikely to qualify for National Register listing because of poor integrity. Site locations that have been in pasture or woodland for most of the historic and modern eras have a much greater potential for good integrity and National Register eligibility.

The alluvial valleys of the study area, where they have not been channelized or otherwise altered, have a high potential for prehistoric sites in a buried context within the terrace landform sediment assemblages. Sites in these locations could be found in a near-surface to deeply buried contexts, with buried sites having a very good potential for National Register eligibility because the integrity of a buried site is often well preserved by the act of burial within alluvial/colluvial deposits.

Historic Site Potential of Study Area

Figures 16-17 present the data compiled by the assessment study of the historic site potential of the study area. There is potential for sites dating from the early historic to modern eras within the majority of the study area. Site types will include: early habitation sites, later farmstead sites, mill sites, coal mine sites, cemeteries and pioneer burial grounds, rural church and schools sites, former post offices, stagecoach stops, Underground Railroad sites, crossroads settlement sites, and abandoned or sparsely populated former townsites. The sites shown on Figure 16-17 appear to have a good potential for National Register eligibility <u>if</u> site integrity is found to be sufficient, and/or are culturally-sensitive sites, particularly cemeteries and burial grounds that should be avoided by any proposed construction projects.

Not represented on these maps are the many rural school and church sites that are potential archaeological sites in the study area. Some of the former schools and churches are still standing and represent potentially significant architectural properties (see Rogers and Price 2012). However, the majority of the schools, in particular, are no longer standing and their former locations represent potentially significant archaeological sites. Figures 18-19 are selected historic plat maps of the study area that highlight the number of rural schools and churches once in this area. While certainly site types of potential significance, such sites would require historical associations of significance to be considered National Register eligible.

Conclusions

None of the potential project corridors encompassed within the overall study area have been previously surveyed for archaeological resources except for small parcels or narrow corridors along existing roadways. As such, most of the selected preferred corridor or corridors will require Phase I investigation of the Area of Potential Effect, likely resulting in the identification of previously unrecorded prehistoric and historic sites. Any identified sites would be evaluated for potential National Register eligibility resulting in either a determination of ineligibility or potential eligibility. Ineligible sites would warrant no further investigation, while potentially eligible sites would be recommended for either avoidance or Phase II testing if they could not be feasibly or prudently avoided by the proposed highway construction project.

Cemeteries or locations containing human remains are further protected by local and state laws and are generally recommended for preservation and protection from impacts. The known historic period cemeteries have been identified on Figures 16-17; however, unmarked pioneer burials and burying grounds could be encountered within the study area, their locations yet to be identified. At present, no prehistoric burial sites have been identified in the study area; however, such sites could be encountered in the vicinity of the major creek and river valleys of the area.

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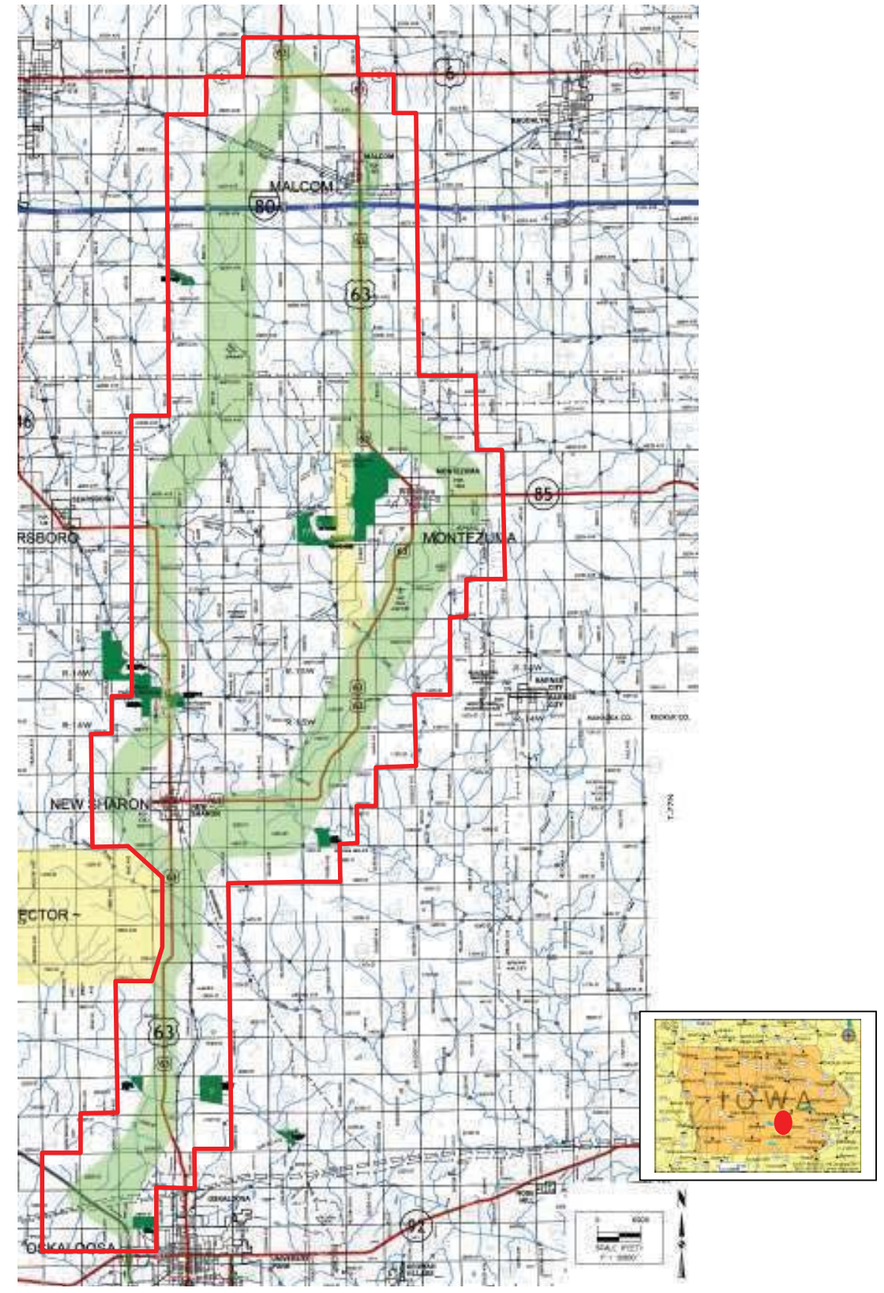


Figure 1. Current study area (red outline) for U.S. Highway 63 Corridor Study
Base map provided by Snyder & Associates, Inc., Ankeny, Iowa, with study area overlay added by Tallgrass Historians L.C., Iowa City.

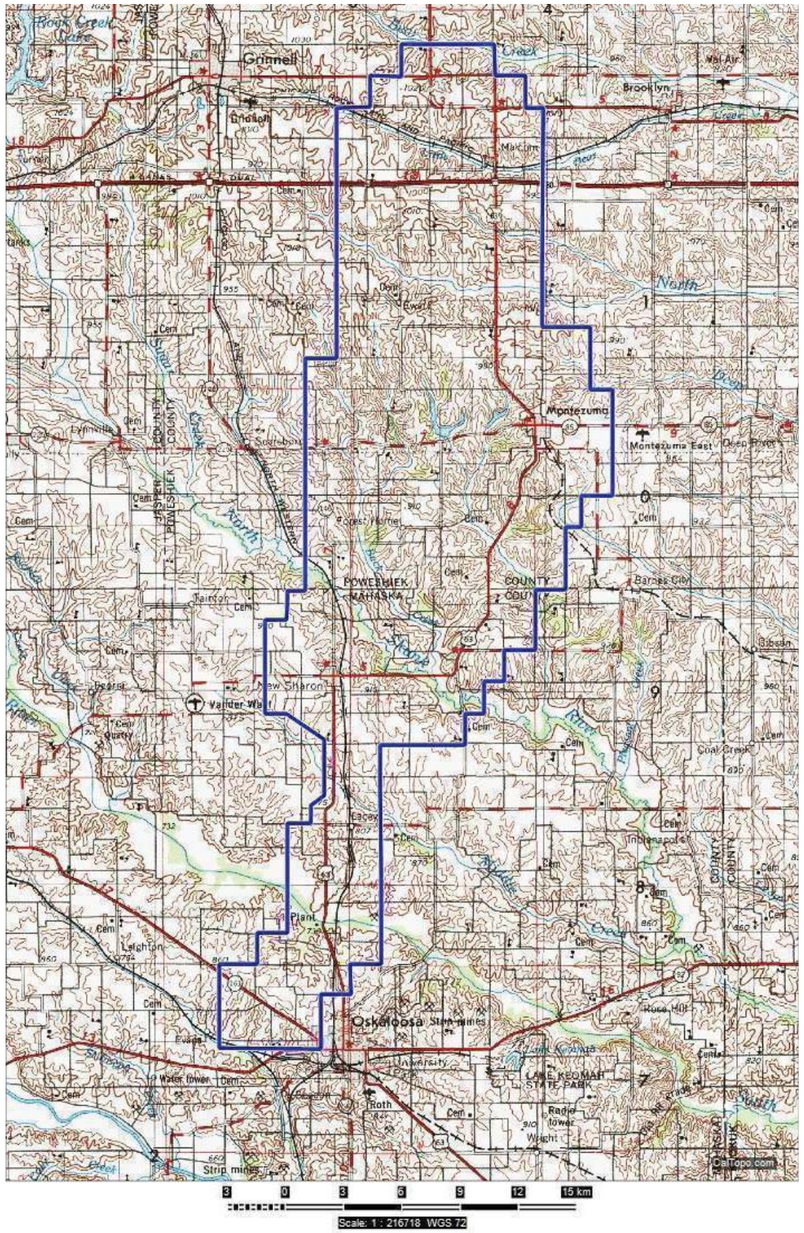


Figure 2. Topographic location of current study area (blue outline)
Source: USGS Poweshiek and Mahaska county topographic maps obtained from ExpertGPS mapping software, 2012

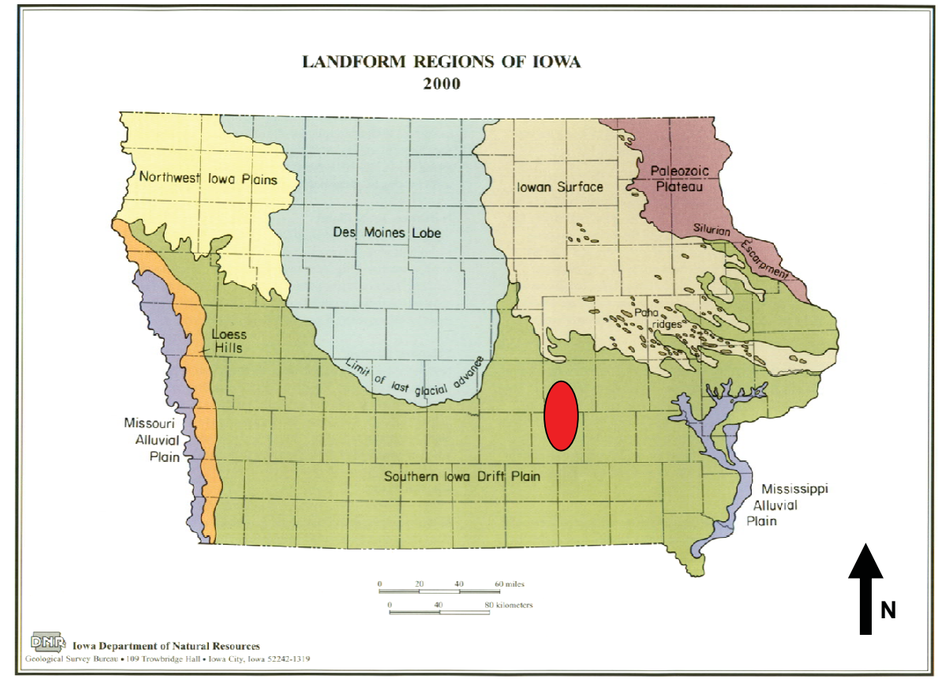


Figure 3. Landform regions of Iowa showing general project location (red oval)
Source: Iowa Department of Natural Resources, 2000

Map Unit Symbol	Map Unit Name
7	Wiota silt loam, 0 to 2 percent slopes
8B	Judson silty clay loam, 2 to 5 percent slopes
11B	Colo-Ely silty clay loams, 0 to 5 percent slopes
24D2	Shelby loam, 9 to 14 percent slopes, moderately eroded
51	Vesser silt loam, 0 to 2 percent slopes
54	Zook silty clay loam, 0 to 2 percent slopes
120C	Tama silty clay loam, 5 to 9 percent slopes
120C2	Tama silty clay loam, 5 to 9 percent slopes, moderately eroded
120D2	Tama silty clay loam, 9 to 14 percent slopes, moderately eroded
133	Colo silty clay loam, 0 to 2 percent slopes
133+	Colo silt loam, overwash, 0 to 2 percent slopes
162D2	Downs silt loam, 9 to 14 percent slopes, moderately eroded
220	Nodaway silt loam, 0 to 2 percent slopes
430	Ackmore silt loam, 0 to 2 percent slopes
484	Lawson silt loam, 0 to 2 percent slopes
792D2	Armstrong loam, 9 to 14 percent slopes, moderately eroded
993D2	Gara-Armstrong loams, 9 to 14 percent slopes, moderately eroded

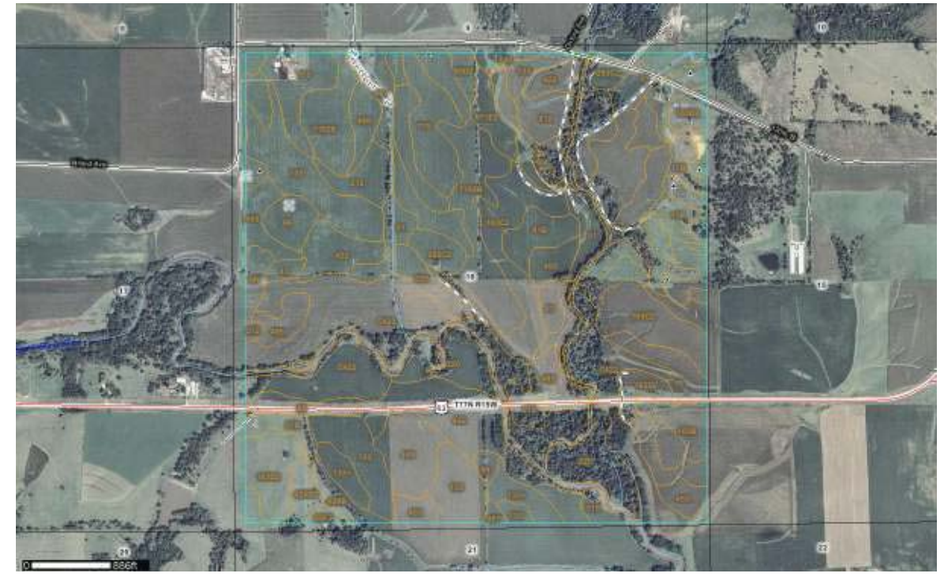
Figure 4. Mapped soils within a portion of Big Bear Creek in current study area in Poweshiek County. Source: Artz 2005; Soil Survey Staff 2012; Web Soil Survey 2012

Map Unit Symbol	Map Unit Name
8C	Judson silty clay loam, 5 to 9 percent slopes
11B	Colo-Ely silty clay loams, 0 to 5 percent slopes
20D2	Killduff silty clay loam, 9 to 14 percent slopes, moderately eroded
24D2	Shelby loam, 9 to 14 percent slopes, moderately eroded
54	Zook silty clay loam, 0 to 2 percent slopes
93D2	Shelby-Adair complex, 9 to 14 percent slopes, moderately eroded
120B	Tama silty clay loam, 2 to 5 percent slopes
120C2	Tama silty clay loam, 5 to 9 percent slopes, moderately eroded
133	Colo silty clay loam, 0 to 2 percent slopes
133+	Colo silt loam, overwash, 0 to 2 percent slopes
192D2	Adair clay loam, 9 to 14 percent slopes, moderately eroded
273B	Olmitz loam, 2 to 5 percent slopes
293D2	Chelsea-Ladoga complex, 9 to 14 percent slopes, moderately eroded
430	Ackmore silt loam, 0 to 2 percent slopes
484	Lawson silt loam, 0 to 2 percent slopes
688	Koszta silt loam, 0 to 2 percent slopes
1220	Nodaway-Ackmore silt loams, channeled, 0 to 2 percent slopes
5040	Orthents, loamy
SL	Sewage lagoon

Figure 5. Mapped soils within a portion of Little Bear Creek adjacent to current U.S. Highway 63 in Poweshiek County.
Source: Artz 2005; Soil Survey Staff 2012; Web Soil Survey 2012

Map Unit Symbol	Map Unit Name
7	Wiota silt loam, 0 to 2 percent slopes
8B	Judson silty clay loam, 2 to 5 percent slopes
11B	Colo-Ely silty clay loams, 0 to 5 percent slopes
24D2	Shelby loam, 9 to 14 percent slopes, moderately eroded
51	Vesser silt loam, 0 to 2 percent slopes
76B	Ladoga silt loam, 2 to 5 percent slopes
76C2	Ladoga silt loam, 5 to 9 percent slopes, moderately eroded
76D2	Ladoga silt loam, 9 to 14 percent slopes, moderately eroded
88	Nevin silty clay loam, 0 to 2 percent slopes
93D2	Shelby-Adair complex, 9 to 14 percent slopes, moderately eroded
133+	Colo silt loam, overwash, 0 to 2 percent slopes
179D2	Gara loam, 9 to 14 percent slopes, moderately eroded
220	Nodaway silt loam, 0 to 2 percent slopes
281B	Otley silty clay loam, 2 to 5 percent slopes
281C	Otley silty clay loam, 5 to 9 percent slopes
281C2	Otley silty clay loam, 5 to 9 percent slopes, moderately eroded
293D2	Chelsea-Ladoga complex, 9 to 14 percent slopes, moderately eroded
428B	Ely silty clay loam, 2 to 5 percent slopes
430	Ackmore silt loam, 0 to 2 percent slopes
453	Tuskeego silt loam, 0 to 2 percent slopes
484	Lawson silt loam, 0 to 2 percent slopes
570D2	Nira silty clay loam, 9 to 14 percent slopes moderately eroded
592D2	Mystic clay loam, 9 to 14 percent slopes, moderately eroded
876C2	Ladoga silt loam, benches, 5 to 9 percent slopes, moderately eroded
881B	Otley silty clay loam, benches, 2 to 5 percent slopes

Figure 6. Mapped soils within a portion of North English River valley adjacent to current U.S. Highway 63 in Poweshiek County. Source: Artz 2005; Soil Survey Staff 2012; Web Soil Survey 2012

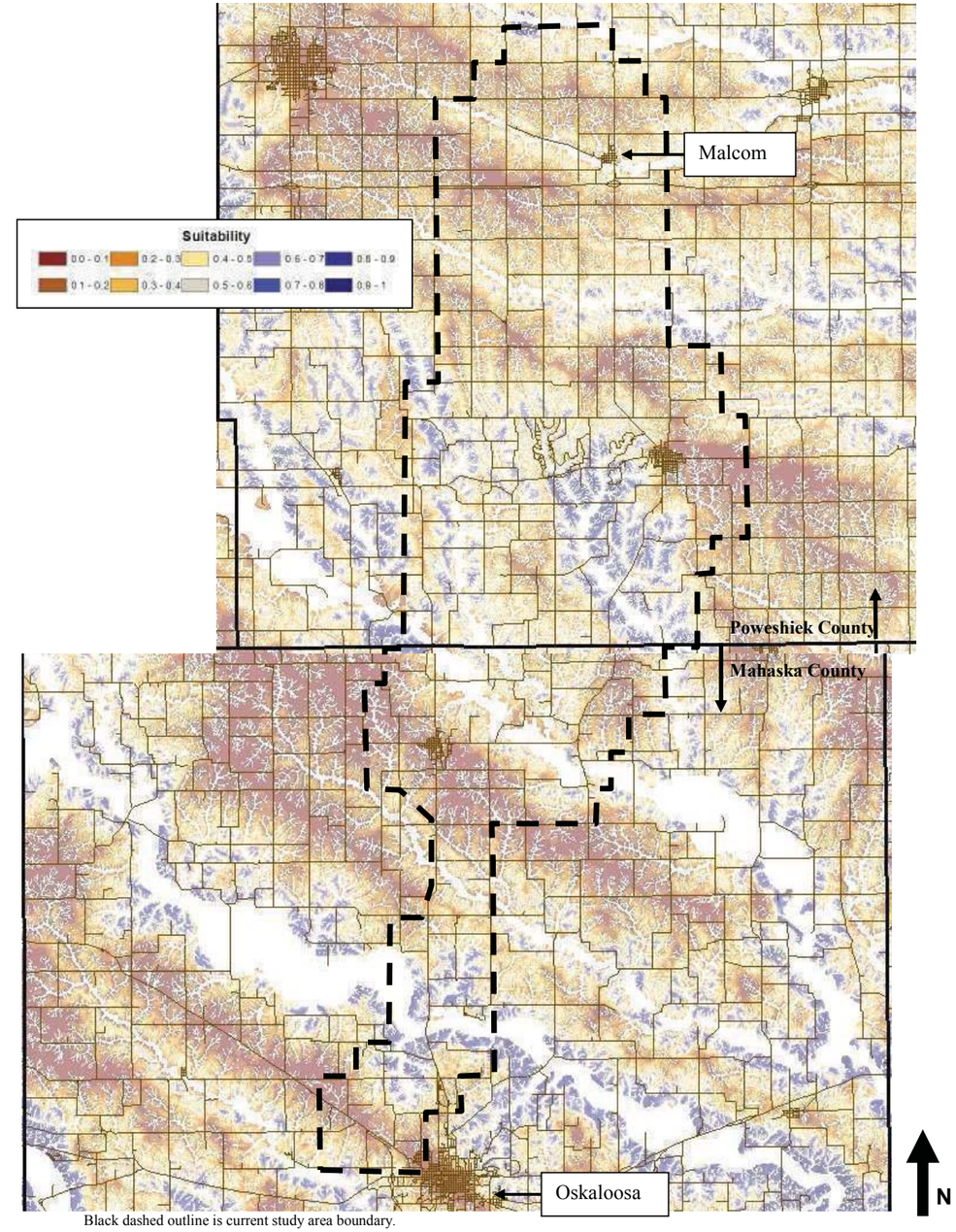


Map Unit Symbol	Map Unit Name
11B	Colo-Ely silty clay loams, 2 to 5 percent slopes
13B	Nodaway-Vesser silt loams, 2 to 5 percent slopes
43	Bremer silty clay loam, 0 to 2 percent slopes
51	Vesser silt loam, 0 to 2 percent slopes
51B	Vesser silt loam, 2 to 5 percent slopes
54	Zook silty clay loam, 0 to 2 percent slopes
65F2	Lindley loam, 18 to 25 percent slopes, moderately eroded
75	Givin silt loam, 1 to 3 percent slopes
80C2	Clinton silt loam, 5 to 9 percent slopes, moderately eroded
80D2	Clinton silt loam, 9 to 14 percent slopes, moderately eroded
98	Huntsville silt loam, 0 to 2 percent slopes
133	Colo silty clay loam, 0 to 2 percent slopes
133+	Colo silt loam, overwash, 0 to 2 percent slopes
163B	Fayette silt loam, 2 to 5 percent slopes
163C2	Fayette silt loam, 5 to 9 percent slopes, moderately eroded
163D2	Fayette silt loam, 9 to 14 percent slopes, moderately eroded
163E2	Fayette silt loam, 14 to 18 percent slopes, moderately eroded
212	Kennebec silt loam, 0 to 2 percent slopes
220	Nodaway silt loam, 0 to 2 percent slopes
293C2	Chelsea-Clinton complex, 5 to 9 percent slopes, moderately eroded
293D2	Chelsea-Clinton complex, 9 to 14 percent slopes, moderately eroded
293E2	Chelsea-Clinton complex, 14 to 18 percent slopes, moderately eroded
315	Nodaway-Alluvial land complex, 0 to 2 percent slopes
422	Amana silty clay loam, 0 to 2 percent slopes
424D2	Lindley-Keswick complex, 9 to 14 percent slopes, moderately eroded
424E2	Lindley-Keswick complex, 14 to 18 percent slopes, moderately eroded
428B	Ely silty clay loam, 2 to 5 percent slopes
453	Tuskeego silt loam, 0 to 2 percent slopes
467	Radford silt loam, 0 to 2 percent slopes

Figure 7. Mapped soils within a portion of North Skunk River valley adjacent to current U.S. Highway 63 in Mahaska County. Source: Artz 2005; Soil Survey Staff 2012; Web Soil Survey 2012

Map Unit Symbol	Map Unit Name
11B	Colo-Ely silty clay loams, 2 to 5 percent slopes
13B	Nodaway-Vesser silt loams, 2 to 5 percent slopes
76D2	Ladoga silt loam, 9 to 14 percent slopes, moderately eroded
133	Colo silty clay loam, 0 to 2 percent slopes
133+	Colo silt loam, overwash, 0 to 2 percent slopes
163B	Fayette silt loam, 2 to 5 percent slopes
163C2	Fayette silt loam, 5 to 9 percent slopes, moderately eroded
163D2	Fayette silt loam, 9 to 14 percent slopes, moderately eroded
163E2	Fayette silt loam, 14 to 18 percent slopes, moderately eroded
212	Kennebec silt loam, 0 to 2 percent slopes
220	Nodaway silt loam, 0 to 2 percent slopes
315	Nodaway-Alluvial land complex, 0 to 2 percent slopes
354	Marsh
422	Amana silty clay loam, 0 to 2 percent slopes
467	Radford silt loam, 0 to 2 percent slopes
489	Ossian silt loam, 0 to 2 percent slopes
1313F	MUNTERVILLE silt loam, 18 to 25 percent slopes
C422	Amana complex, channeled, 0 to 2 percent slopes
T162B	Downs silt loam, benches, 2 to 5 percent slopes

Figure 8. Mapped soils within a portion of South Skunk River valley adjacent to current U.S. Highway 63 in Mahaska County.
Source: Artz 2005; Soil Survey Staff 2012; Web Soil Survey 2012



Black dashed outline is current study area boundary.

Figure 9. Map showing current study area's archaeological site suitability based on predictive modeling.
Source: University of Iowa 2005

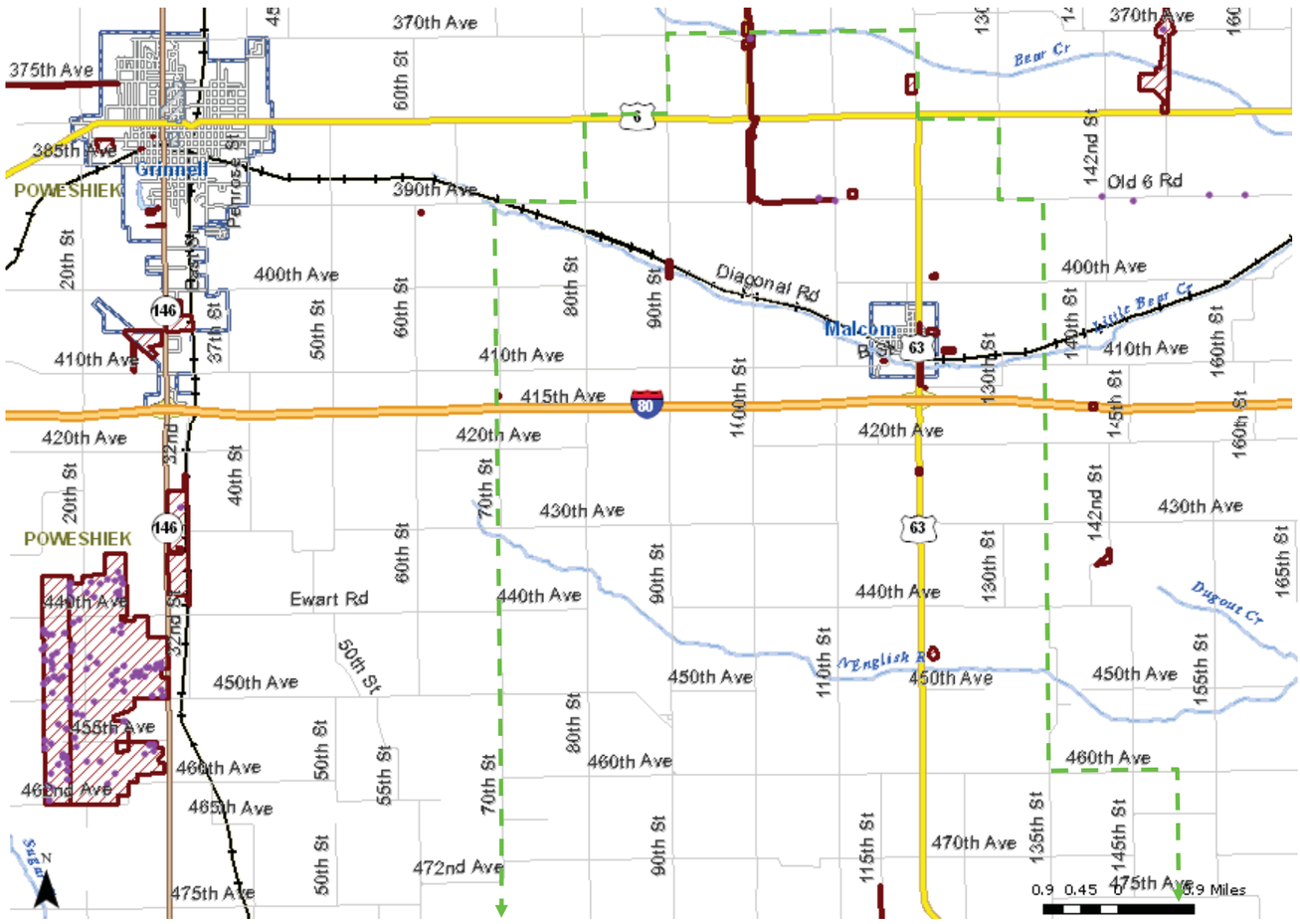


Figure 10. Location of previous survey areas and previously recorded archaeological sites. Source: I-Sites Pro 2012

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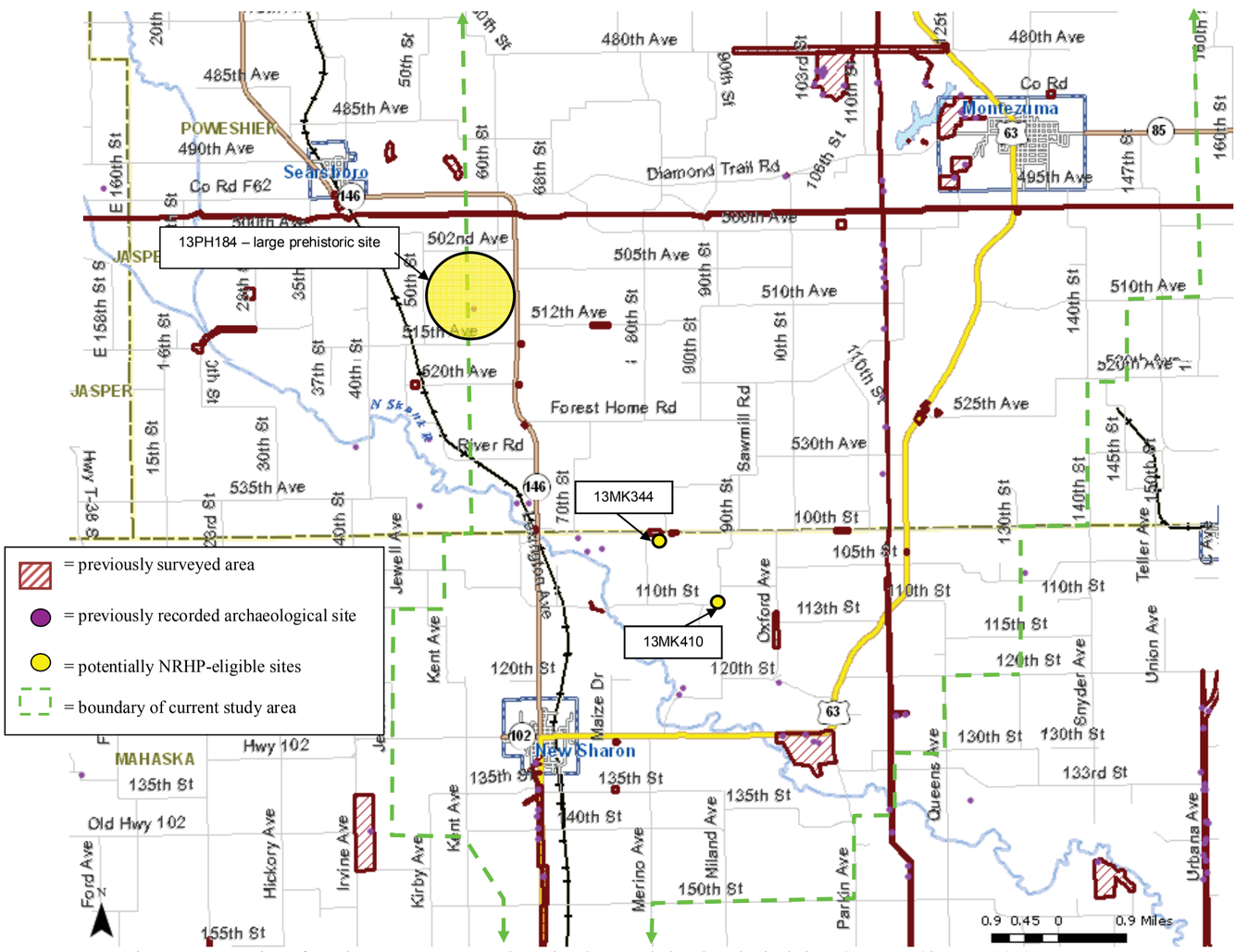

Figure 11. Location of previous survey areas and previously recorded archaeological sites. Source: I-Sites Pro 2012

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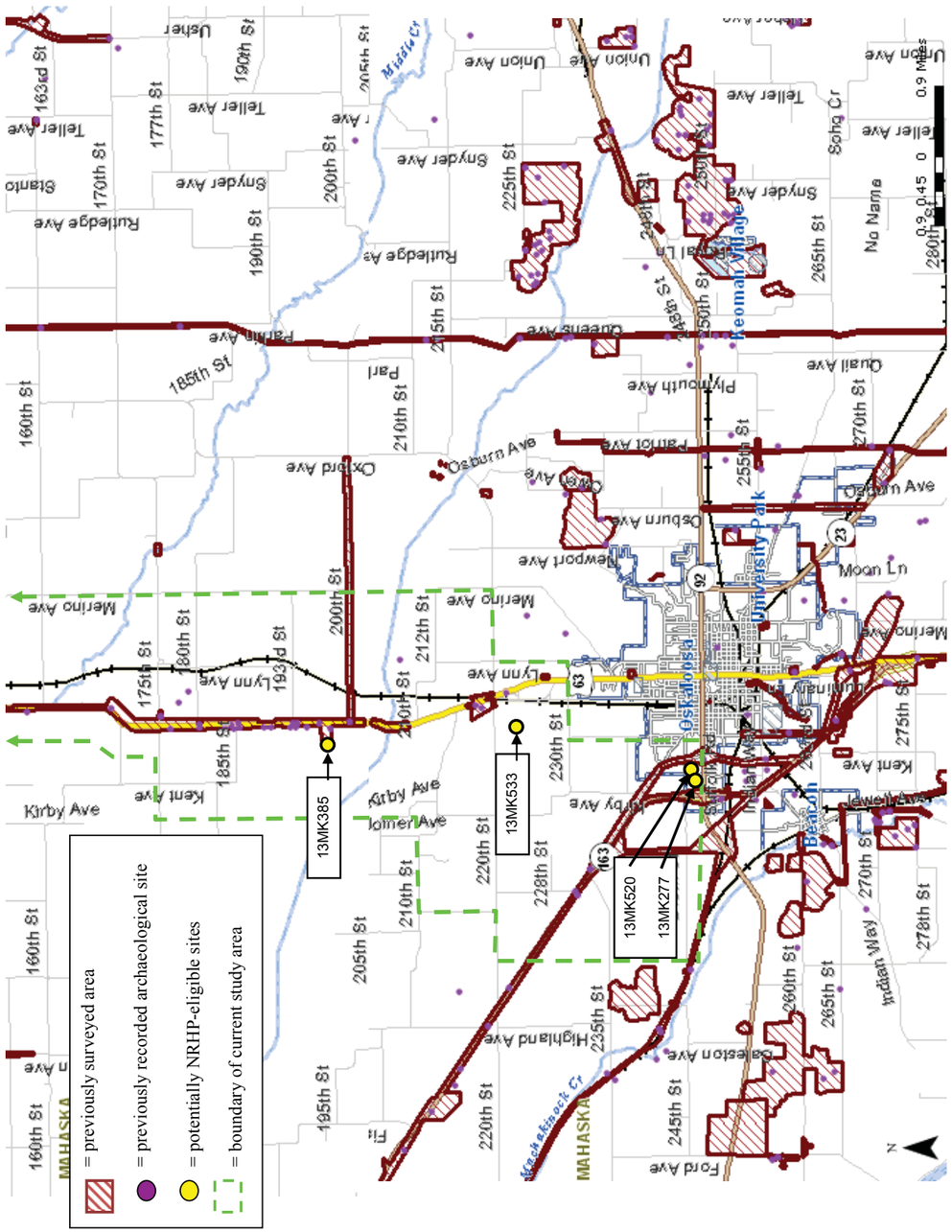


Figure 12. Location of previous survey areas and previously recorded archaeological sites. Source: I-Sites Pro 2012

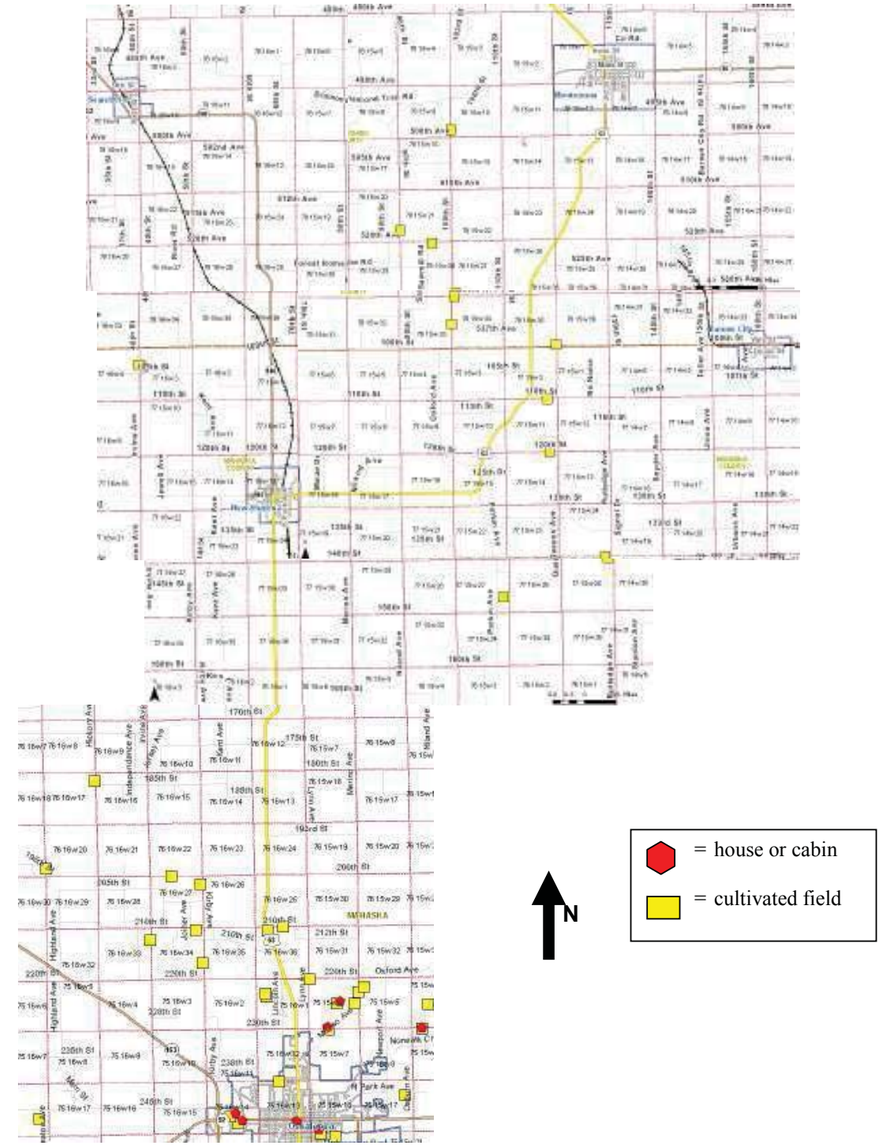
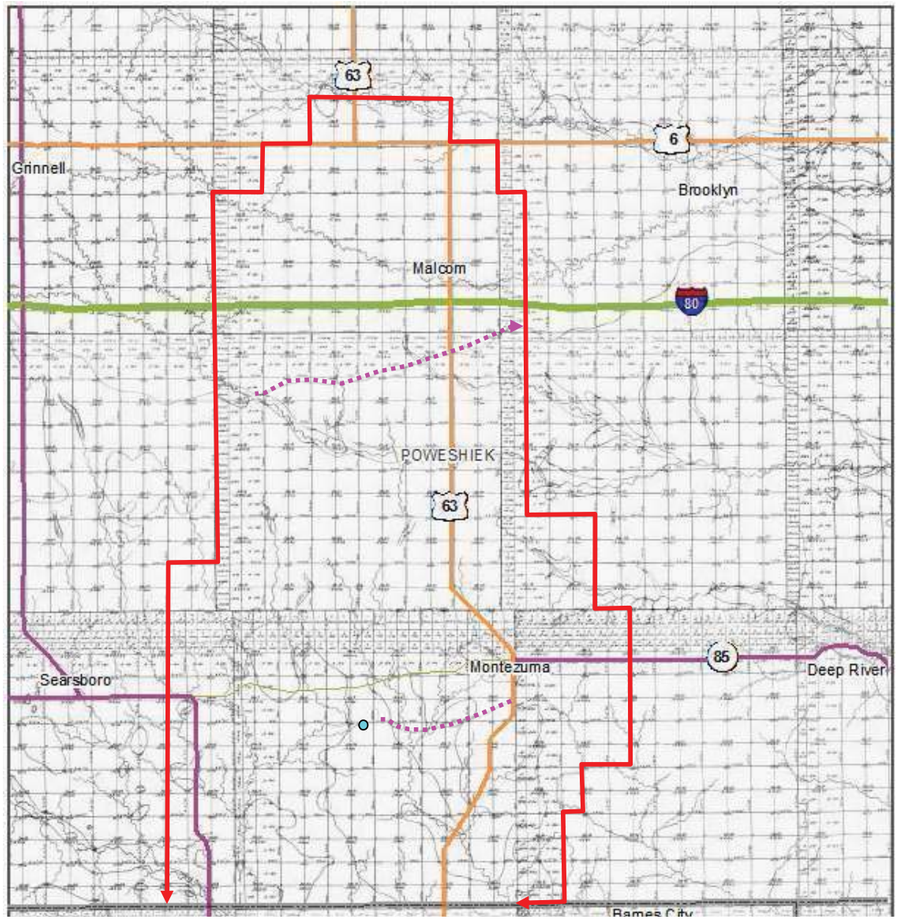
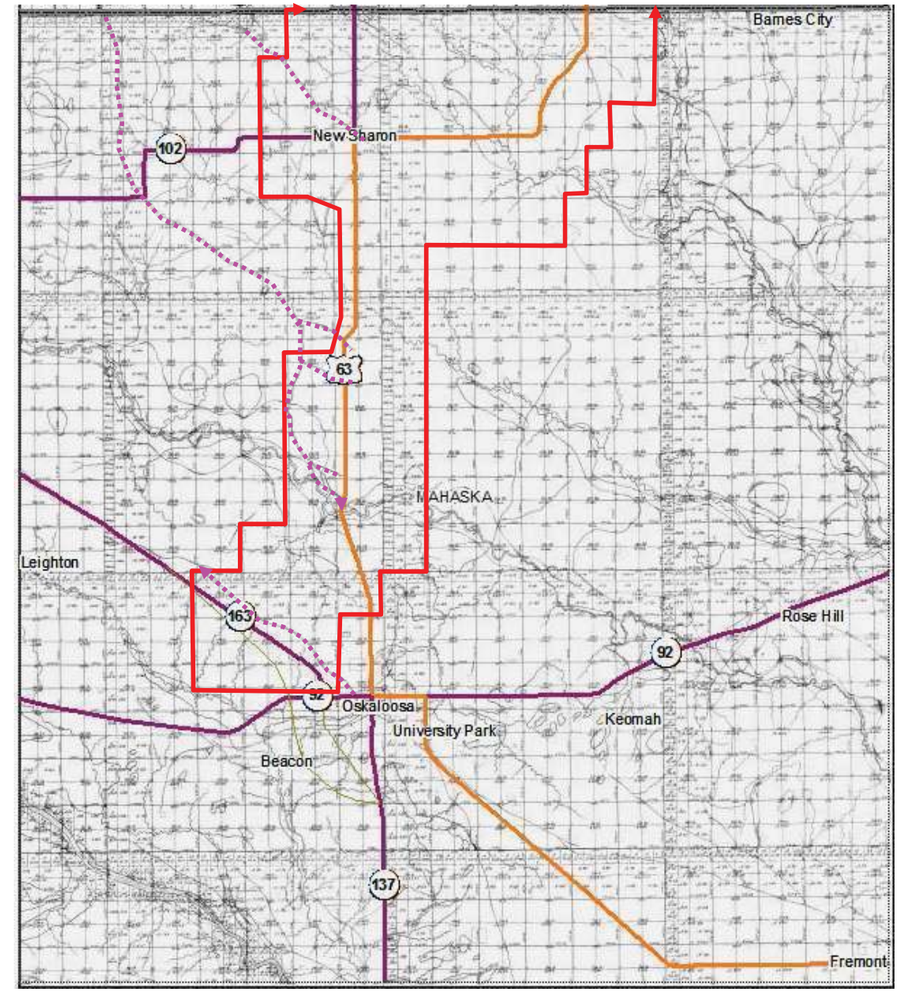


Figure 13. Street map showing location of cabins and fields illustrated on early historic General Land Office plats of the U.S. 63 Corridor Study area. Note only the area between Montezuma and Oskaloosa had such features platted on the original maps. Source: I-Sites Pro 2012



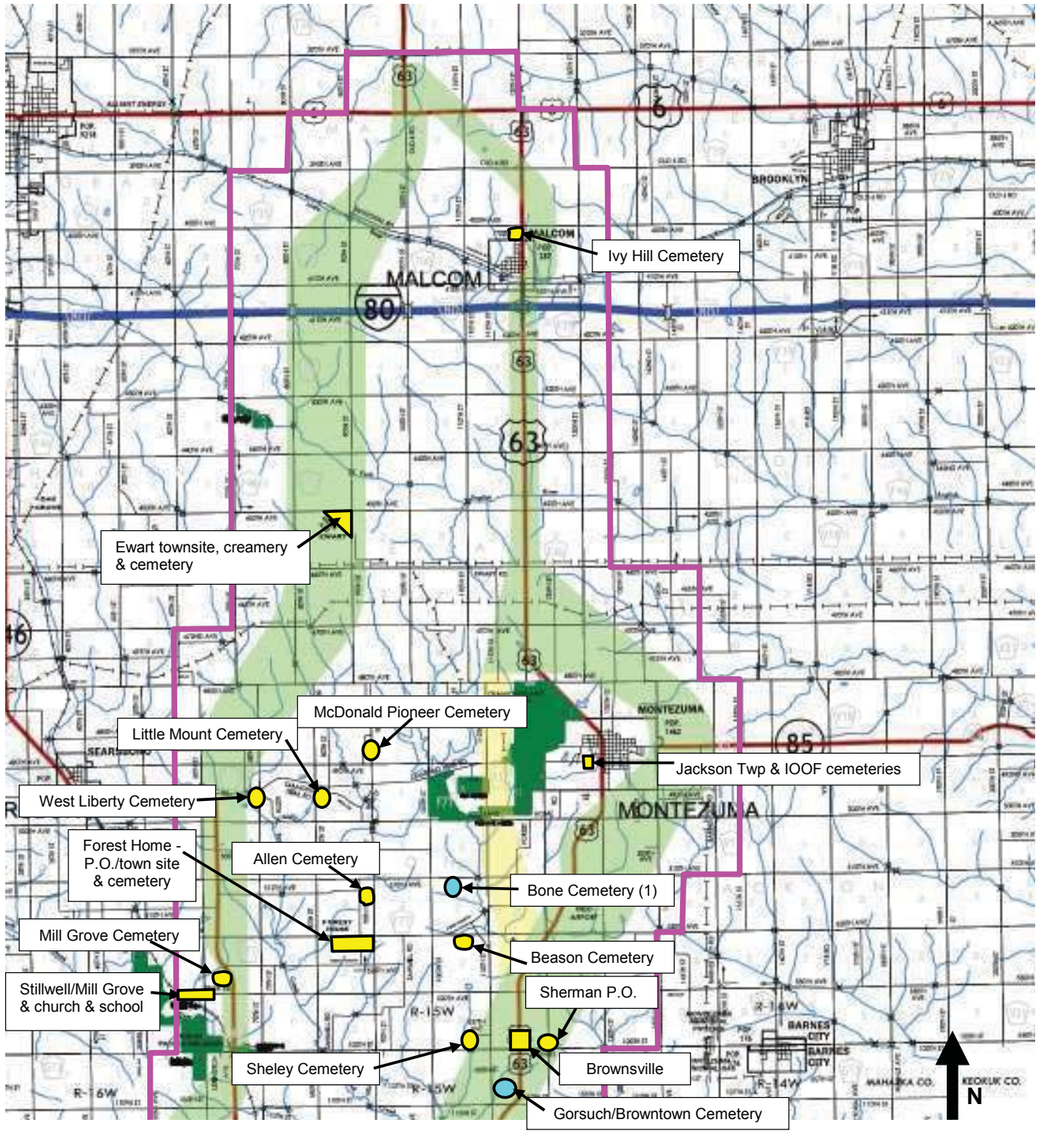
= trail or road depicted on GLO = natural spring depicted on GLO

Figure 14. Digitized 1847-48 General Land Office (GLO) original survey plats showing Poweshiek County study area (red outline). Sources: I-Sites Pro 2012; United States 1847, 1848



= trail or road depicted on GLO

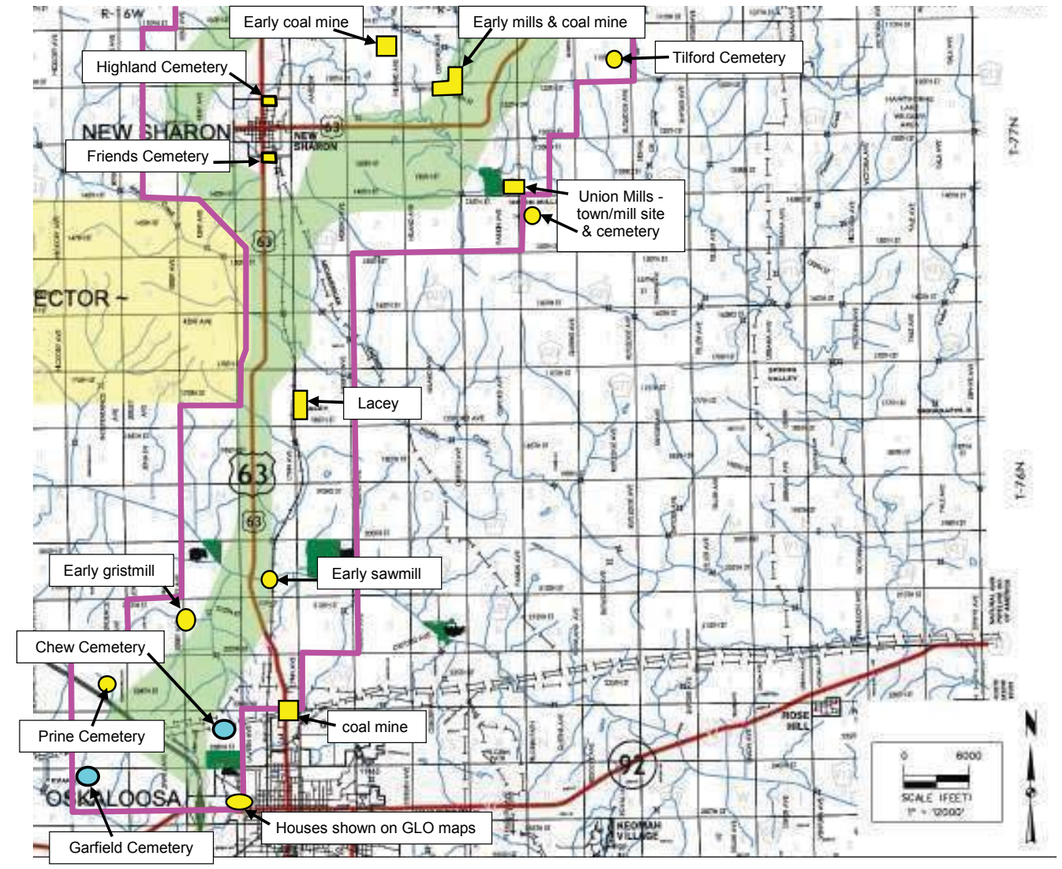
Figure 15. Digitized 1847-48 General Land Office (GLO) original survey plats showing general project corridor (red outline). Sources: I-Sites Pro 2012; United States 1847, 1848



= potentially significant historic period archaeological sites (early settlements, industrial sites, and cemeteries)

= pioneer cemetery location that remains uncertain

Figure 16. Location of potentially significant historic period archaeologist sites in current study area (pink outline)



= potentially significant historic period archaeological sites (early settlements, industrial sites, and cemeteries)

= pioneer cemetery locations that remain uncertain

Figure 17. Location of potentially significant historic period archaeologist sites in current study area (pink outline)

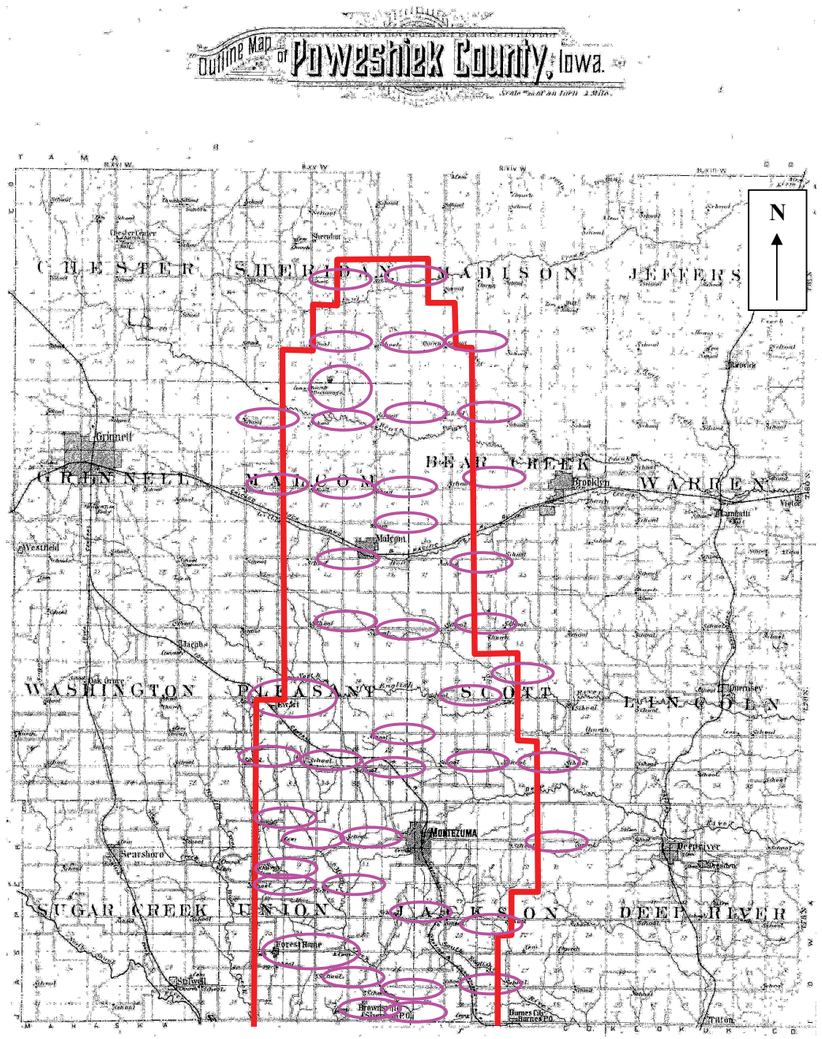


Figure 18. 1896 Poweshiek County plat map showing general location of potential historic sites (circled in pink; primarily schools and churches) in the current study area (red outline)
Source: Ogle 1896

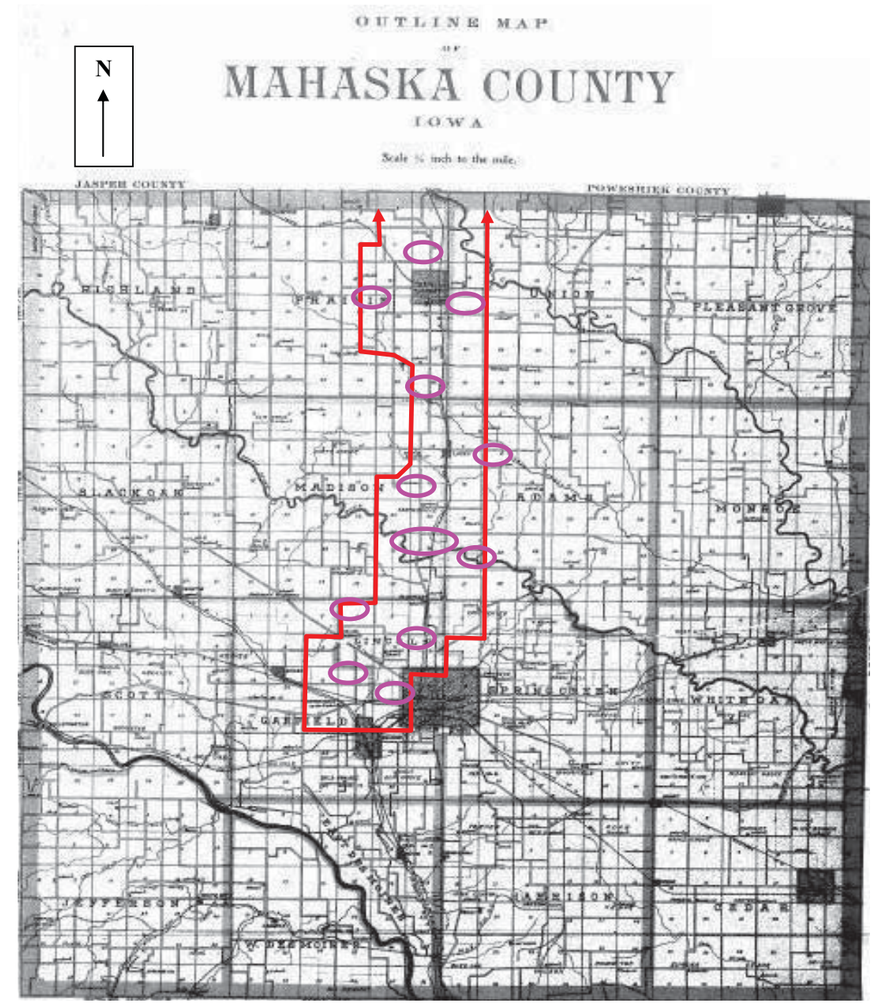


Figure 19. 1905 Mahaska County plat map showing general location of potential historic sites (circled in pink; primarily schools and churches) in the current study area (red outline)
Source: Midland Map 1905

Plate 1. Big Bear Creek, Poweshiek County, Section 12, facing East.
All photographs taken July-August 2012

Plate 2. Little Bear Creek, Poweshiek County, Section 20, facing East.

Plate 3. Channelized section of Little Bear Creek, Poweshiek County, Section 27, facing East.

Plate 4. North English River, Poweshiek County, Section 8, facing East.

Plate 5. North Skunk River from 110th St., Mahaska County, facing South.

Plate 6. Location of the former Ewart Creamery, Poweshiek County, from 90th St. & North St, facing NE

Plate 7. Allen Cemetery, Section 20, Poweshiek County, from 512th Ave. & 90th St., facing SE.

Plate 8. Forest Home Pioneer Cemetery, Union Township, Section 29, Poweshiek County, facing South.

Plate 9. Location of the former village of Forest Home, Poweshiek County, facing South.

Plate 10. Mill Grove Pioneer Cemetery, Poweshiek County, facing North.

Plate 11. Location of the former village of Mill Grove, Poweshiek County. View NW from River Rd.

Plate 12. Location of the former village of Stillwell, Poweshiek County, View NW from River Rd.

Plate 13. McDonald Pioneer Burial Ground, Poweshiek County, facing East

Plate 14. Location of the former village of Brownsville, U.S. 63 & 100th St., Poweshiek County, facing NW.

Plate 15. Tilford Cemetery, Mahaska County, facing South.

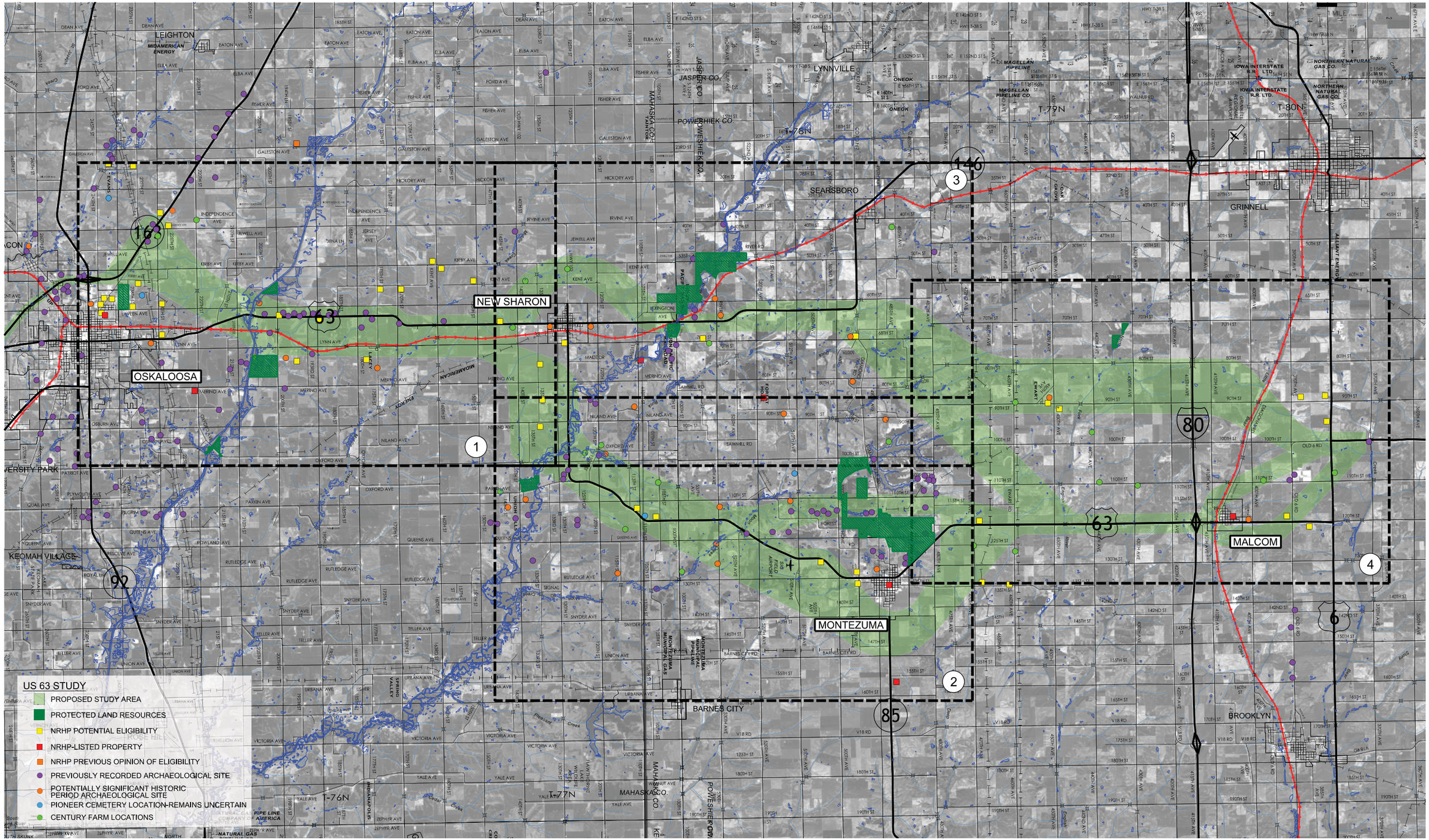
Plate 16. Union Mills, Mahaska County, facing South.

Plate 17. Location of the former Union Mills, Mahaska County.
Note the foundation in background (yellow circle). Facing West.

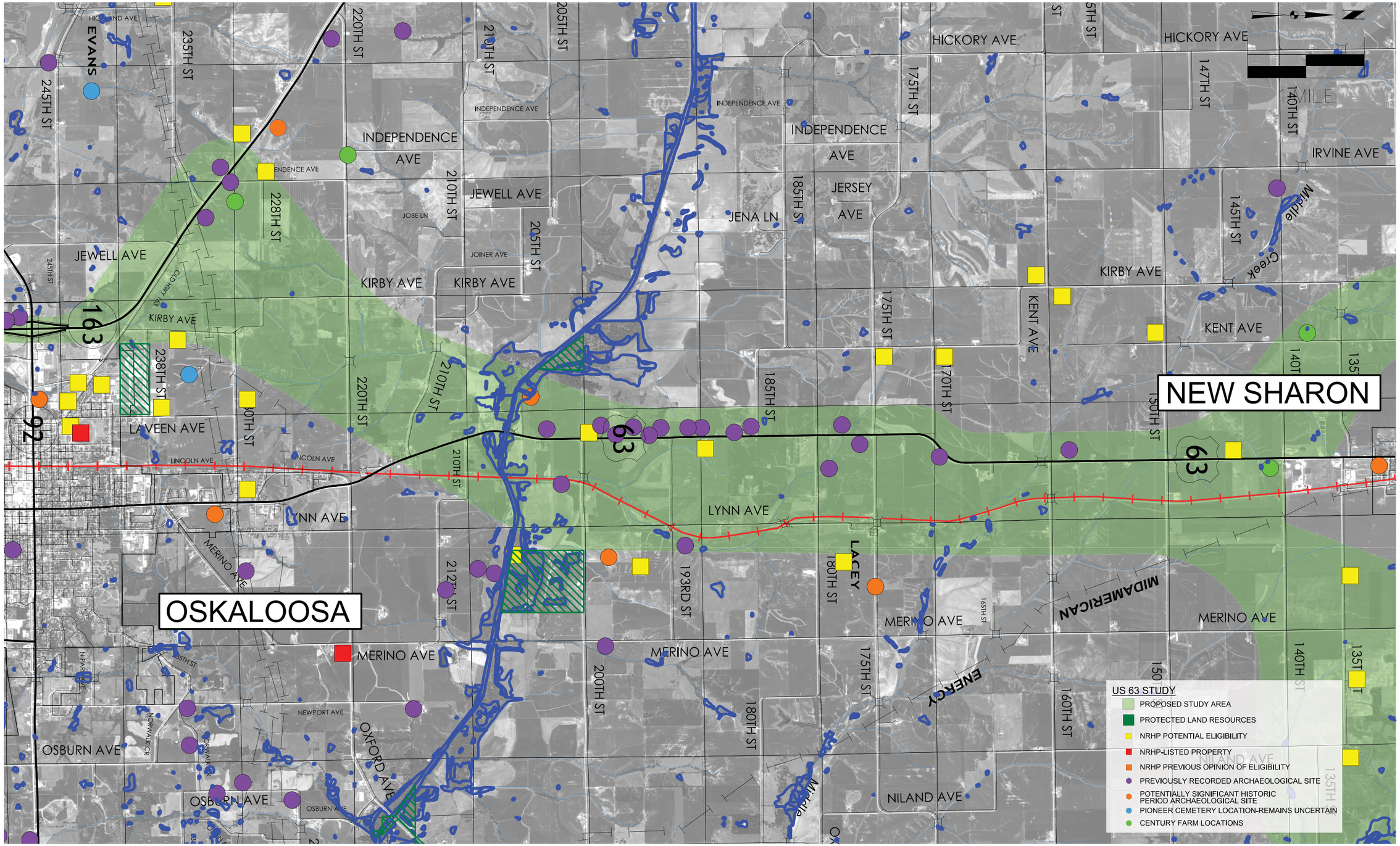
Plate 18. Former mill site, Section 34, Mahaska County, west of Kirby Ave, facing SW.

Plate 19. Location of former coal mine (yellow circle) at 230th St. & E of U.S. 63, Mahaska County, facing South.

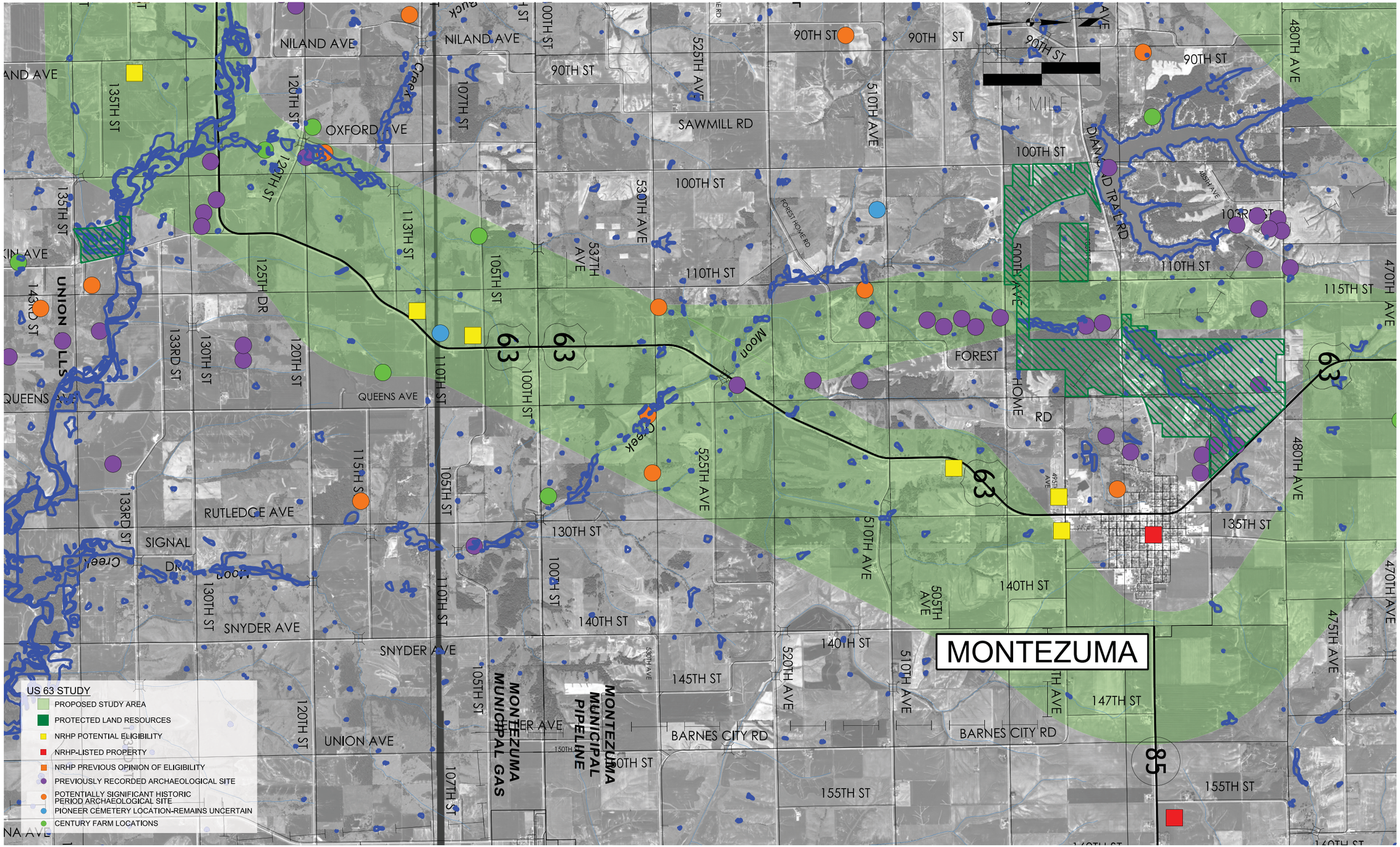
PROTECTED RESOURCES



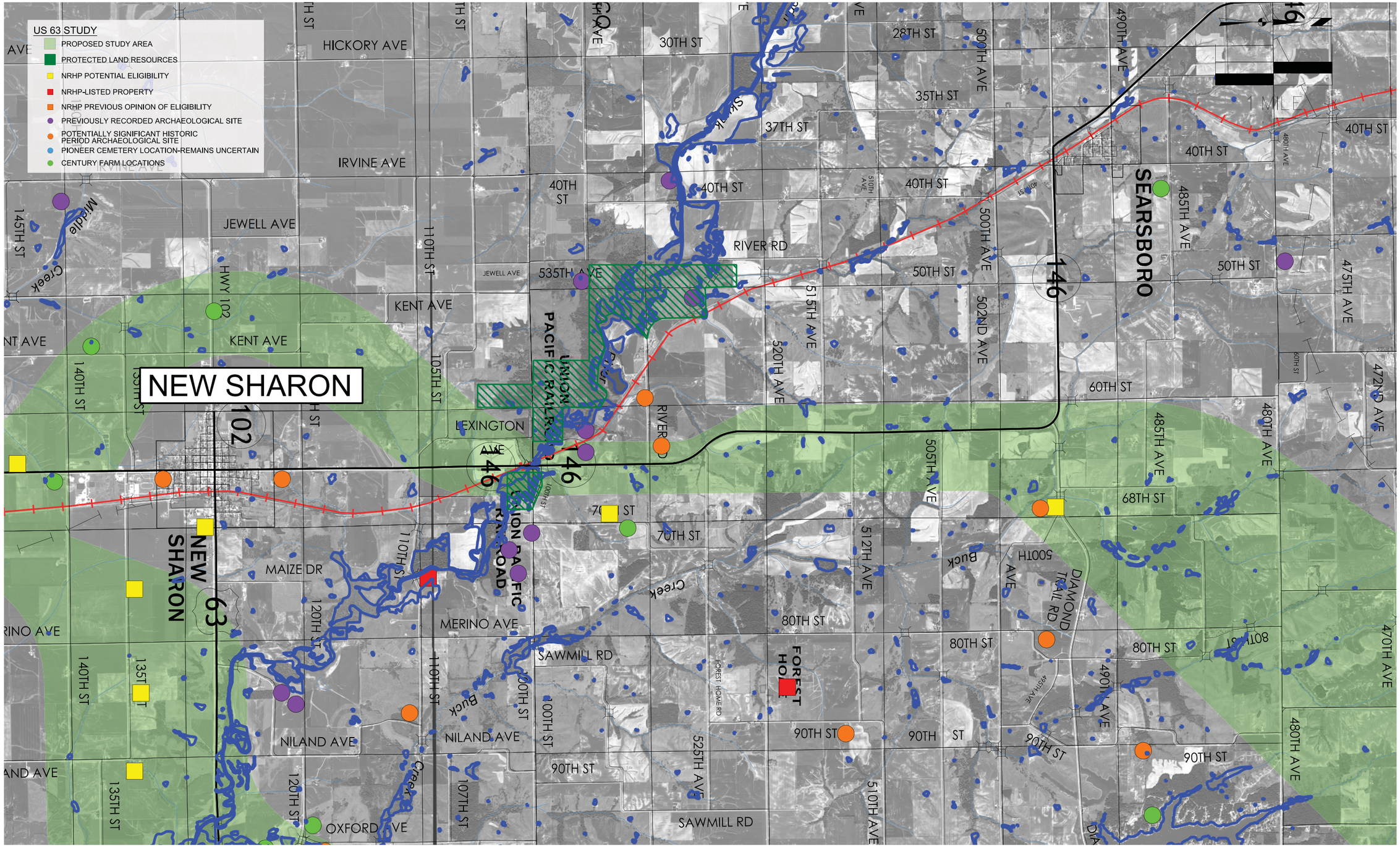
PROTECTED RESOURCES - MAP 1



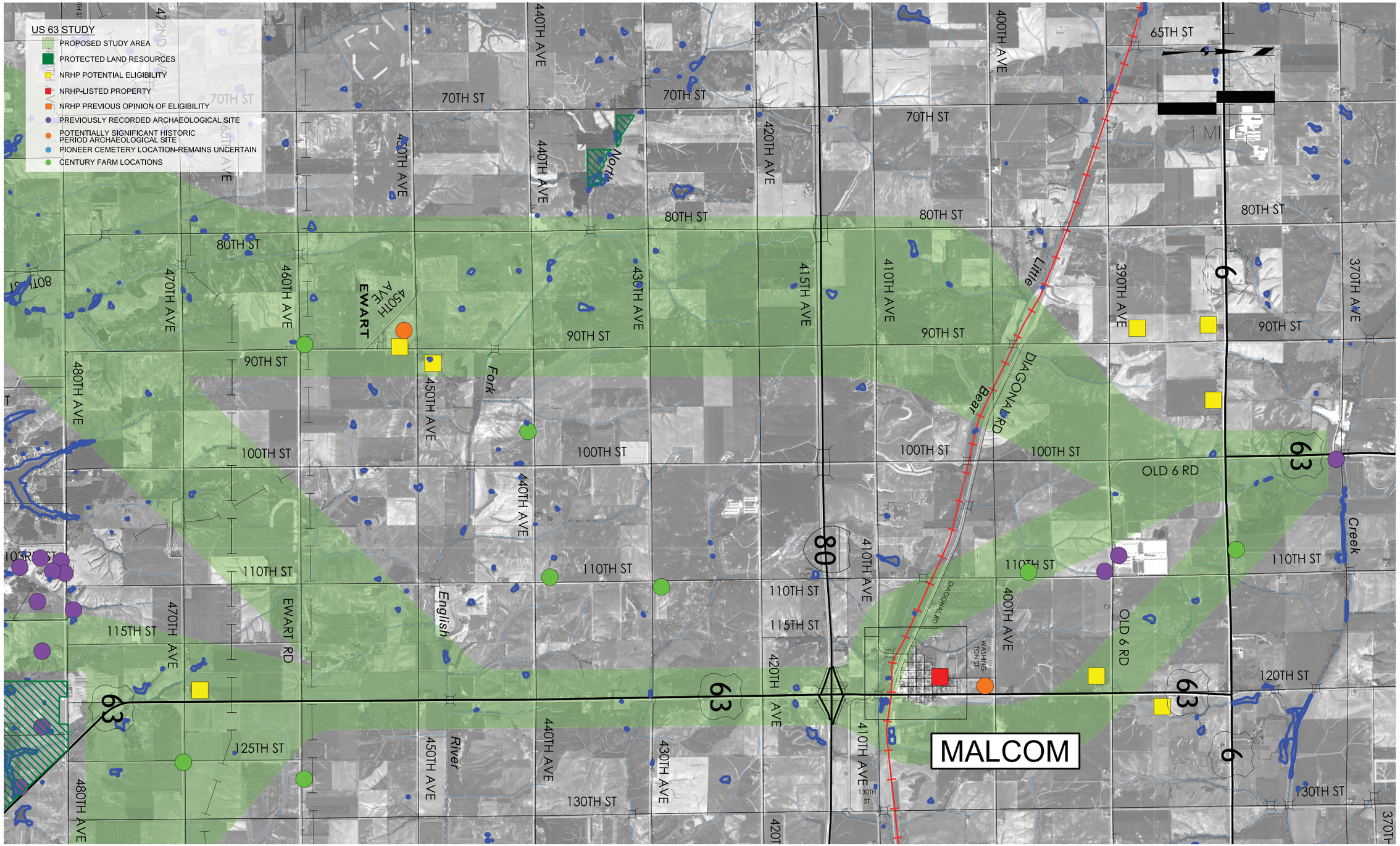
PROTECTED RESOURCES - MAP 2



PROTECTED RESOURCES - MAP 3



PROTECTED RESOURCES - MAP 4



APPENDICES

Noise Considerations

Guidelines provided by the U.S. Department of Transportation's *Highway Traffic Noise: Analysis and Abatement Guideline* were used to predict sound contours for the existing and proposed traffic conditions along U.S. Highway 63. The document states that for residential areas, the L_{eq} must not be higher than 67 dBAs. This is the decibel level where there is interference with normal speech communication. The L_{eq} is defined as the equivalent steady-state sound level which in a stated period of time contains the same acoustic energy as the time-varying sound level during the same time period, with $L_{eq}(h)$ being the hourly value of L_{eq}. FHWA Traffic Noise Modeling 2.5 Software was used to predict the hourly $LA_{eq}1h$. LAeq1h is how the modeling software refers to $L_{eq}(h)$. The criteria shown in the Existing and Proposed Sound Contour Criteria Tables were used in the FHWA Traffic Noise Modeling 2.5 Software to predict the sound contours for both scenarios.

Existing Sound Contour Criteria

Existing 2010 ADT	Vehicle Type	Vehicles Per Hour	Speed (mph)	Ground Zone
2700	Auto	195	65	Lawn
	Truck	48	65	

Proposed Sound Contour Criteria

Predicted 2040 ADT	Vehicle Type	Vehicles Per Hour	Speed (mph)	Ground Zone
7500	Auto	540	65	Lawn
	Truck	135	65	

The 2010 current and 2040 predicted traffic on U.S. Highway 63 were split into four traffic segments, refer to section 3.2 Traffic Projection. The Oskaloosa to New Sharon segment had the highest ADT volumes for both the existing and proposed traffic levels, therefore this stretch of roadway was used for both models. In order to calculate LAeq1h, the traffic noise software requires the vehicles per hour of the daily peak in traffic. 9% of the ADT was used to calculate the hourly daily peak in traffic. To determine the amount of automobiles and trucks on the roadway, a ratio of 80/20 was used to determine the vehicles per hour by vehicle type. The final input required is the ground zone, which is the type of terrain that is in the study area. Since the majority of the residents along U.S. Highway 63 have typical yards, the ground zone 'Lawn' was selected for program. In order to gage what the sound levels would be, Receivers were inserted in the software program and were spaced at 50 ft intervals from the centerline of the outer most lane. With this information, the Traffic Noise Modeling software calculated a predicted hourly $LA_{eq}1h$. The Existing and Proposed Traffic Sound Contour Tables show the results of the predicted sound levels.

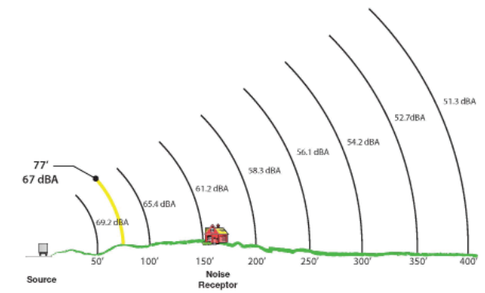
Existing Traffic Sound Contour Levels

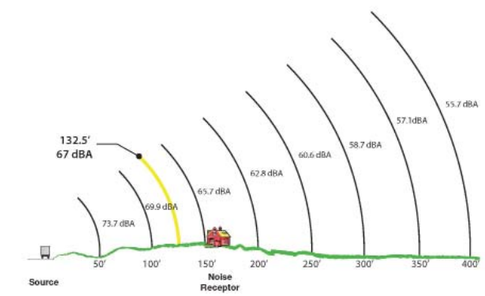
Distance from Centerline of the Outer Most Lane (ft)	Calculated $LA_{eq}1h$ (dBA)
50	69.2
77	67
100	65.4
150	61.2
200	58.3
250	56.1
300	54.2
350	52.7
400	51.3

Proposed Traffic Sound Contour Levels

Distance from Centerline of the Outer Most Lane (ft)	Calculated $LA_{eq}1h$ (dBA)
50	73.7
100	69.9
132.5	67
150	65.7
200	62.8
250	60.6
300	58.7
350	57.1
400	55.7

The results of The Existing Traffic Sound Contour Table show the sound levels of existing U.S. Highway 63 traffic. The sound level reaches the 67 dBA level in 77 ft from the centerline of the outermost lanes, as shown in the top figure. With the ADT traffic increasing from 2700 to 7500, the proposed 2040 traffic sound contour levels also increased. The distance to which the proposed traffic sound level attenuates to 67 dBA is 132.5 ft, as shown in the bottom figure. To be able to better gage the sound levels listed above, the Common Outdoor Sound Levels Table displays the sound levels of outdoor noises. To count receivers for the purposes of comparison, a distance of 400 ft was used. This length is calculated as the distance it takes for a point-source noise from a heavy truck to dissaipate to a tolerated level.





Sound Contour Figures

Decibel Level (dBA)	Type of Outdoor Noise
100	Jet Flyover at 1000 ft
90	Gas Lawn Mower at 3 ft
80	Diesel Truck at 50 ft
70	Gas Lawn Mower at 100 ft
50	Quiet Urban Daytime
40	Quiet Urban Nighttime
20	Quiet Rural Nighttime
0	Threshold of Hearing

Common Outdoor Sound Levels

Explanation of Cost Opinions for the Ultimate Corridor Options

Order of Magnitude Costs for the East and West Alternative Ultimate Build routes are shown in the following tables; costs for each segment are also provided. The major bid items were calculated using the elements of 4-lane highway construction. Major bid items such as earthwork, pavement, modified subbase, granular and paved shoulders, subdrains, box culverts, bridges, and right-of-way were calculated as follows.

1. A cubic yard estimation of earthwork for each of the segments was calculated using the estimated profile in Microstation and a typical 4-lane highway cross section. In order to determine a unit price for the earthwork, the volume of earthwork was compared to past Iowa DOT construction projects. Based on projects of similar size, $2 per cubic yard was used for this project.

2. The modified subbase quantity was determined using a typical cross section of a 4-lane highway. The subbase is 8" thick, the inside lanes are 12' wide and the outside lanes are 14' wide. The volume was then calculated by the length of each segment. An average unit price of $25 per cubic yard was used in calculating the cost.

3. The granular shoulder material was estimated in tons based on a 6" thickness. For both lanes it was determined a 2' wide shoulder would be used for the inside lane and a 4' wide shoulder would be used for the outside lanes. The quantity of material needed could then be determined from the length of the segment multiplied by a conversion factor of 140 pounds per cubic foot for granular shoulders. A unit cost of $20 per ton was used.

4. Similar to the granular material, a 6" HMA paved shoulder was used. It was assumed that all paved shoulders would be 4' wide. Multiplying the 16' total width by the length of the roadway segment, a square yardage estimate of HMA was calculated. A unit cost of $25 per square yard was used.

5. The area of 10" PCC pavement was calculated by multiply the 52' total width of the lanes by the length of roadway for each segment. A unit price of $45 per square yard was used for the estimate.

6. Using the Iowa Geographic Map Server, the number and size of significant waterways in the study corridor was determined. A precast concrete box culvert was used at smaller waterway crossings. Based on comparable Iowa DOT construction projects, it was determined that $300,000 was an appropriate average unit price to use for a precast concrete culvert.

7. The amount of longitudinal subdrain required was determined by the length of each of the segments. A unit price of $7 per lineal foot was used.

8. A small bridge was used for larger creek crossings. A unit price of $1.5 million was used for the cost estimate. This number was estimated using a common bridge size of 100' wide by 200' long. Previous bridge construction projects were reviewed in order to estimate a cost per square foot. It was determined that $75 per square foot should be used for the creek bridge estimate.

9. Bridges to be used for interchanges or overpasses were estimated to cost $3.0 million. This dollar amount was determined by estimating a width of 100' and a length of 200'. A cost of $150 per square foot was used based on information from previous Iowa DOT bid tabulations.

10. An estimate of $7.5 million was used for a bridge when the improvement options cross the Skunk River. An estimate that the bridge would need to be 600' long and 100' wide was used to calculate the square footage. Based on information from previous Iowa DOT projects, it seemed appropriate to use $125 per square foot to estimate the unit price the bridge.

11. A ±25% factor was used to estimate the cost of miscellaneous construction items. This factor was determined based on cost information obtained from previous projects, by calculating the percentage of the smaller bid items to the overall cost of the project. Some of the miscellaneous construction items considered were clearing and grubbing, pavement removal, median culverts, revetment material, signage, lighting, guardrails, seeding and mulching, and silt fence.

A construction contingency (±25%) was added to the subtotal cost, and preliminary and geotechnical engineering (±8%), and construction engineering (±6%) were then added as a percentage of the total construction cost. Construction limits were set for the improvement options when calculating an earthwork quantity. Comparing the amount of square footage needed for the improvement options to the amount of available existing right-of-way, an area of proposed right-of-way was determined. The east alignment requires approximately 1,620 acres and the west alignment requires approximately 1,460 acres. $10,000 per acre was deemed appropriate for acquiring right-of-way for the proposed alignments. The total project cost was then calculated for the east and west ultimate build improvement options.

The estimated total construction cost of the recommended East Alignment is $293 million.

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COSTS

U.S. HIGHWAY 63 IMPROVEMENTS - EAST ALIGNMENT
ULTIMATE BUILD 4-LANE HIGHWAY

ITEM NUMBER	ITEM DESCRIPTION	UNIT OF MEASURE	TOTAL UNITS	UNIT PRICE	EXTENDED COST
1	EARTHWORK	CY	14,745,900	$ 2	$ 29,491,800
2	MODIFIED SUBBASE	CY	296,700	$ 25	$ 7,417,500
3	GRANULAR SHOULDER, TYPE A	TON	81,600	$ 20	$ 1,632,000
4	PAVED SHOULDER, HMA, 6"	SY	358,400	$ 25	$ 8,960,000
5	PAVEMENT, PCC, 10"	SY	1,084,900	$ 45	$ 48,820,500
6	PRECAST CONCRETE BOX CULVERT	EA	20	$ 300,000	$ 6,000,000
7	SUBDRAIN, LONGITUDINAL, 4"	LF	362,500	$ 7	$ 2,537,500
8	BRIDGE - CREEK	EA	4	$ 1,500,000	$ 6,000,000
9	BRIDGE - INTERCHANGE/OVERPASS	EA	10	$ 3,000,000	$ 30,000,000
10	BRIDGE - RIVER	EA	2	$ 7,500,000	$ 15,000,000
11	MISCELLANEOUS CONSTRUCTION ITEMS	LS	1	$ 38,140,700	$ 38,140,700

SUBTOTAL		$ 194,000,000
CONTINGENCY	±25%	$ 48,700,000
TOTAL CONSTRUCTION COST		**$ 242,700,000**
PRELIMINARY ENGINEERING AND GEOTECHNICAL	±8%	$ 19,400,000
CONSTRUCTION ENGINEERING	±6%	$ 14,700,000
RIGHT-OF-WAY ACQUISITION		$ 16,200,000
TOTAL PROJECT COST		**$ 293,000,000**

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COSTS

U.S. HIGHWAY 63 IMPROVEMENTS - WEST ALIGNMENT
ULTIMATE BUILD 4-LANE HIGHWAY

ITEM NUMBER	ITEM DESCRIPTION	UNIT OF MEASURE	TOTAL UNITS	UNIT PRICE	EXTENDED COST
1	EARTHWORK	CY	13,168,600	$ 2	$ 26,337,200
2	MODIFIED SUBBASE	CY	280,800	$ 25	$ 7,020,000
3	GRANULAR SHOULDER, TYPE A	TON	77,300	$ 20	$ 1,546,000
4	PAVED SHOULDER, HMA, 6"	SY	315,800	$ 25	$ 7,895,000
5	PAVEMENT, PCC, 10"	SY	1,026,700	$ 45	$ 46,201,500
6	PRECAST CONCRETE BOX CULVERT	EA	24	$ 300,000	$ 7,200,000
7	SUBDRAIN, LONGITUDINAL, 4"	LF	291,400	$ 7	$ 2,039,800
8	BRIDGE - CREEK	EA	1	$ 1,500,000	$ 1,500,000
9	BRIDGE - INTERCHANGE/OVERPASS	EA	8	$ 3,000,000	$ 24,000,000
10	BRIDGE - RIVER	EA	2	$ 7,500,000	$ 15,000,000
11	MISCELLANEOUS CONSTRUCTION ITEMS	LS	1	$ 36,260,500	$ 36,260,500

SUBTOTAL		$ 175,000,000
CONTINGENCY	±25%	$ 43,900,000
TOTAL CONSTRUCTION COST		$ 218,900,000
PRELIMINARY ENGINEERING AND GEOTECHNICAL	±8%	$ 17,500,000
CONSTRUCTION ENGINEERING	±6%	$ 13,200,000
RIGHT-OF-WAY ACQUISITION		$ 14,400,000
TOTAL PROJECT COST		**$ 264,000,000**

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COSTS

U.S. HIGHWAY 63 IMPROVEMENTS - SEGMENT A
ULTIMATE BUILD 4-LANE HIGHWAY

ITEM NUMBER	ITEM DESCRIPTION	UNIT OF MEASURE	TOTAL UNITS	UNIT PRICE	EXTENDED COST
1	EARTHWORK	CY	558,500	$ 2	$ 1,117,000
2	MODIFIED SUBBASE	CY	26,600	$ 25	$ 665,000
3	GRANULAR SHOULDER, TYPE A	TON	7,300	$ 20	$ 146,000
4	PAVED SHOULDER, HMA, 6"	SY	29,900	$ 25	$ 747,500
5	PAVEMENT, PCC, 10"	SY	97,300	$ 45	$ 4,378,500
6	PRECAST CONCRETE BOX CULVERT	EA	2	$ 300,000	$ 600,000
7	SUBDRAIN, LONGITUDINAL, 4"	LF	33,700	$ 7	$ 235,900
8	BRIDGE - CREEK	EA	0	$ 1,500,000	$ -
9	BRIDGE - INTERCHANGE/OVERPASS	EA	1	$ 3,000,000	$ 3,000,000
10	BRIDGE - RIVER	EA	0	$ 7,500,000	$ -
11	MISCELLANEOUS CONSTRUCTION ITEMS	LS	1	$ 2,110,100	$ 2,110,100

SUBTOTAL		$ 13,000,000
CONTINGENCY	±25%	$ 3,300,000
TOTAL CONSTRUCTION COST		**$ 16,300,000**
PRELIMINARY ENGINEERING AND GEOTECHNICAL	±8%	$ 1,300,000
CONSTRUCTION ENGINEERING	±6%	$ 1,000,000
RIGHT-OF-WAY ACQUISITION		$ 1,450,000
TOTAL PROJECT COST		**$ 20,050,000**

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COSTS

U.S. HIGHWAY 63 IMPROVEMENTS - SEGMENT B2
ULTIMATE BUILD 4-LANE HIGHWAY

ITEM NUMBER	ITEM DESCRIPTION	UNIT OF MEASURE	TOTAL UNITS	UNIT PRICE	EXTENDED COST
1	EARTHWORK	CY	2,627,100	$ 2	$ 5,254,200
2	MODIFIED SUBBASE	CY	45,100	$ 25	$ 1,127,500
3	GRANULAR SHOULDER, TYPE A	TON	12,400	$ 20	$ 248,000
4	PAVED SHOULDER, HMA, 6"	SY	50,700	$ 25	$ 1,267,500
5	PAVEMENT, PCC, 10"	SY	164,900	$ 45	$ 7,420,500
6	PRECAST CONCRETE BOX CULVERT	EA	3	$ 300,000	$ 900,000
7	SUBDRAIN, LONGITUDINAL, 4"	LF	57,100	$ 7	$ 399,700
8	BRIDGE - CREEK	EA	0	$ 1,500,000	$ -
9	BRIDGE - INTERCHANGE/OVERPASS	EA	1	$ 3,000,000	$ 3,000,000
10	BRIDGE - RIVER	EA	1	$ 7,500,000	$ 7,500,000
11	MISCELLANEOUS CONSTRUCTION ITEMS	LS	1	$ 6,882,600	$ 6,882,600

SUBTOTAL		$ 34,000,000
CONTINGENCY	±25%	$ 8,500,000
TOTAL CONSTRUCTION COST		**$ 42,500,000**
PRELIMINARY ENGINEERING AND GEOTECHNICAL	±8%	$ 3,400,000
CONSTRUCTION ENGINEERING	±6%	$ 2,600,000
RIGHT-OF-WAY ACQUISITION		$ 2,460,000
TOTAL PROJECT COST		**$ 50,960,000**

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COSTS

U.S. HIGHWAY 63 IMPROVEMENTS - SEGMENT C1
ULTIMATE BUILD 4-LANE HIGHWAY

ITEM NUMBER	ITEM DESCRIPTION	UNIT OF MEASURE	TOTAL UNITS	UNIT PRICE	EXTENDED COST
1	EARTHWORK	CY	2,985,000	$ 2	$ 5,970,000
2	MODIFIED SUBBASE	CY	76,300	$ 25	$ 1,907,500
3	GRANULAR SHOULDER, TYPE A	TON	21,000	$ 20	$ 420,000
4	PAVED SHOULDER, HMA, 6"	SY	85,900	$ 25	$ 2,147,500
5	PAVEMENT, PCC, 10"	SY	279,100	$ 45	$ 12,559,500
6	PRECAST CONCRETE BOX CULVERT	EA	3	$ 300,000	$ 900,000
7	SUBDRAIN, LONGITUDINAL, 4"	LF	96,600	$ 7	$ 676,200
8	BRIDGE - CREEK	EA	1	$ 1,500,000	$ 1,500,000
9	BRIDGE - INTERCHANGE/OVERPASS	EA	4	$ 3,000,000	$ 12,000,000
10	BRIDGE - RIVER	EA	1	$ 7,500,000	$ 7,500,000
11	MISCELLANEOUS CONSTRUCTION ITEMS	LS	1	$ 11,419,300	$ 11,419,300

SUBTOTAL		$ 57,000,000
CONTINGENCY	±25%	$ 14,300,000
TOTAL CONSTRUCTION COST		**$ 71,300,000**
PRELIMINARY ENGINEERING AND GEOTECHNICAL	±8%	$ 5,700,000
CONSTRUCTION ENGINEERING	±6%	$ 4,300,000
RIGHT-OF-WAY ACQUISITION		$ 4,170,000
TOTAL PROJECT COST		**$ 85,470,000**

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COSTS

U.S. HIGHWAY 63 IMPROVEMENTS - SEGMENT D1
ULTIMATE BUILD 4-LANE HIGHWAY

ITEM NUMBER	ITEM DESCRIPTION	UNIT OF MEASURE	TOTAL UNITS	UNIT PRICE	EXTENDED COST
1	EARTHWORK	CY	5,429,000	$ 2	$ 10,858,000
2	MODIFIED SUBBASE	CY	84,100	$ 25	$ 2,102,500
3	GRANULAR SHOULDER, TYPE A	TON	23,200	$ 20	$ 464,000
4	PAVED SHOULDER, HMA, 6"	SY	94,700	$ 25	$ 2,367,500
5	PAVEMENT, PCC, 10"	SY	307,600	$ 45	$ 13,842,000
6	PRECAST CONCRETE BOX CULVERT	EA	6	$ 300,000	$ 1,800,000
7	SUBDRAIN, LONGITUDINAL, 4"	LF	106,500	$ 7	$ 745,500
8	BRIDGE - CREEK	EA	2	$ 1,500,000	$ 3,000,000
9	BRIDGE - INTERCHANGE/OVERPASS	EA	4	$ 3,000,000	$ 12,000,000
10	BRIDGE - RIVER	EA	0	$ 7,500,000	$ -
11	MISCELLANEOUS CONSTRUCTION ITEMS	LS	1	$ 11,820,500	$ 11,820,500

SUBTOTAL		$ 59,000,000
CONTINGENCY	±25%	$ 14,800,000
TOTAL CONSTRUCTION COST		**$ 73,800,000**
PRELIMINARY ENGINEERING AND GEOTECHNICAL	±8%	$ 5,900,000
CONSTRUCTION ENGINEERING	±6%	$ 4,400,000
RIGHT-OF-WAY ACQUISITION		$ 4,600,000
TOTAL PROJECT COST		**$ 88,700,000**

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COSTS

U.S. HIGHWAY 63 IMPROVEMENTS - SEGMENT E
ULTIMATE BUILD 4-LANE HIGHWAY

ITEM NUMBER	ITEM DESCRIPTION	UNIT OF MEASURE	TOTAL UNITS	UNIT PRICE	EXTENDED COST
1	EARTHWORK	CY	1,310,500	$ 2	$ 2,621,000
2	MODIFIED SUBBASE	CY	20,800	$ 25	$ 520,000
3	GRANULAR SHOULDER, TYPE A	TON	5,700	$ 20	$ 114,000
4	PAVED SHOULDER, HMA, 6"	SY	23,400	$ 25	$ 585,000
5	PAVEMENT, PCC, 10"	SY	76,000	$ 45	$ 3,420,000
6	PRECAST CONCRETE BOX CULVERT	EA	2	$ 300,000	$ 600,000
7	SUBDRAIN, LONGITUDINAL, 4"	LF	13,200	$ 7	$ 92,400
8	BRIDGE - CREEK	EA	0	$ 1,500,000	$ -
9	BRIDGE - INTERCHANGE/OVERPASS	EA	0	$ 3,000,000	$ -
10	BRIDGE - RIVER	EA	0	$ 7,500,000	$ -
11	MISCELLANEOUS CONSTRUCTION ITEMS	LS	1	$ 2,047,600	$ 2,047,600

SUBTOTAL		$ 10,000,000
CONTINGENCY	±25%	$ 2,500,000
TOTAL CONSTRUCTION COST		**$ 12,500,000**
PRELIMINARY ENGINEERING AND GEOTECHNICAL	±8%	$ 1,000,000
CONSTRUCTION ENGINEERING	±6%	$ 800,000
RIGHT-OF-WAY ACQUISITION		$ 1,130,000
TOTAL PROJECT COST		**$ 15,430,000**

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COSTS

U.S. HIGHWAY 63 IMPROVEMENTS - SEGMENT F2
ULTIMATE BUILD 4-LANE HIGHWAY

ITEM NUMBER	ITEM DESCRIPTION	UNIT OF MEASURE	TOTAL UNITS	UNIT PRICE	EXTENDED COST
1	EARTHWORK	CY	1,835,800	$ 2	$ 3,671,600
2	MODIFIED SUBBASE	CY	43,800	$ 25	$ 1,095,000
3	GRANULAR SHOULDER, TYPE A	TON	12,000	$ 20	$ 240,000
4	PAVED SHOULDER, HMA, 6"	SY	73,800	$ 25	$ 1,845,000
5	PAVEMENT, PCC, 10"	SY	160,000	$ 45	$ 7,200,000
6	PRECAST CONCRETE BOX CULVERT	EA	4	$ 300,000	$ 1,200,000
7	SUBDRAIN, LONGITUDINAL, 4"	LF	55,400	$ 7	$ 387,800
8	BRIDGE - CREEK	EA	1	$ 1,500,000	$ 1,500,000
9	BRIDGE - INTERCHANGE/OVERPASS	EA	0	$ 3,000,000	$ -
10	BRIDGE - RIVER	EA	0	$ 7,500,000	$ -
11	MISCELLANEOUS CONSTRUCTION ITEMS	LS	1	$ 3,860,600	$ 3,860,600

SUBTOTAL		$ 21,000,000
CONTINGENCY	±25%	$ 5,300,000
TOTAL CONSTRUCTION COST		**$ 26,300,000**
PRELIMINARY ENGINEERING AND GEOTECHNICAL	±8%	$ 2,100,000
CONSTRUCTION ENGINEERING	±6%	$ 1,600,000
RIGHT-OF-WAY ACQUISITION		$ 2,390,000
TOTAL PROJECT COST		**$ 32,390,000**

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COSTS

U.S. HIGHWAY 63 IMPROVEMENTS - SEGMENT G
ULTIMATE BUILD 4-LANE HIGHWAY

ITEM NUMBER	ITEM DESCRIPTION	UNIT OF MEASURE	TOTAL UNITS	UNIT PRICE	EXTENDED COST
1	EARTHWORK	CY	4,977,600	$ 2	$ 9,955,200
2	MODIFIED SUBBASE	CY	94,400	$ 25	$ 2,360,000
3	GRANULAR SHOULDER, TYPE A	TON	26,000	$ 20	$ 520,000
4	PAVED SHOULDER, HMA, 6"	SY	106,200	$ 25	$ 2,655,000
5	PAVEMENT, PCC, 10"	SY	345,100	$ 45	$ 15,529,500
6	PRECAST CONCRETE BOX CULVERT	EA	12	$ 300,000	$ 3,600,000
7	SUBDRAIN, LONGITUDINAL, 4"	LF	55,400	$ 7	$ 387,800
8	BRIDGE - CREEK	EA	0	$ 1,500,000	$ -
9	BRIDGE - INTERCHANGE/OVERPASS	EA	4	$ 3,000,000	$ 12,000,000
10	BRIDGE - RIVER	EA	1	$ 7,500,000	$ 7,500,000
11	MISCELLANEOUS CONSTRUCTION ITEMS	LS	1	$ 14,492,500	$ 14,492,500

SUBTOTAL		$ 69,000,000
CONTINGENCY	±25%	$ 17,300,000
TOTAL CONSTRUCTION COST		**$ 86,300,000**
PRELIMINARY ENGINEERING AND GEOTECHNICAL	±8%	$ 6,900,000
CONSTRUCTION ENGINEERING	±6%	$ 5,200,000
RIGHT-OF-WAY ACQUISITION		$ 4,600,000
TOTAL PROJECT COST		**$ 103,000,000**

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COSTS

U.S. HIGHWAY 63 IMPROVEMENTS - SEGMENT I1
ULTIMATE BUILD 4-LANE HIGHWAY

ITEM NUMBER	ITEM DESCRIPTION	UNIT OF MEASURE	TOTAL UNITS	UNIT PRICE	EXTENDED COST
1	EARTHWORK	CY	5,005,400	$ 2	$ 10,010,800
2	MODIFIED SUBBASE	CY	114,700	$ 25	$ 2,867,500
3	GRANULAR SHOULDER, TYPE A	TON	31,600	$ 20	$ 632,000
4	PAVED SHOULDER, HMA, 6"	SY	129,000	$ 25	$ 3,225,000
5	PAVEMENT, PCC, 10"	SY	419,400	$ 45	$ 18,873,000
6	PRECAST CONCRETE BOX CULVERT	EA	7	$ 300,000	$ 2,100,000
7	SUBDRAIN, LONGITUDINAL, 4"	LF	145,200	$ 7	$ 1,016,400
8	BRIDGE - CREEK	EA	1	$ 1,500,000	$ 1,500,000
9	BRIDGE - INTERCHANGE/OVERPASS	EA	2	$ 3,000,000	$ 6,000,000
10	BRIDGE - RIVER	EA	0	$ 7,500,000	$ -
11	MISCELLANEOUS CONSTRUCTION ITEMS	LS	1	$ 12,775,300	$ 12,775,300

SUBTOTAL		$ 59,000,000
CONTINGENCY	±25%	$ 14,800,000
TOTAL CONSTRUCTION COST		**$ 73,800,000**
PRELIMINARY ENGINEERING AND GEOTECHNICAL	±8%	$ 5,900,000
CONSTRUCTION ENGINEERING	±6%	$ 4,400,000
RIGHT-OF-WAY ACQUISITION		$ 5,890,000
TOTAL PROJECT COST		**$ 89,990,000**

Explanation of Cost Opinions for the Priority Improvements

The Priority Improvements were identified to provide relief to areas along U.S. Highway 63 with the most significant insufficiencies. The Priority Improvements are proposed as construction of new super-2 roadway on new alignment or widening of the existing highway to a super-2 facility. The Priority Improvements also include the acquisition of right-of-way with the intent to upgrade U.S. Highway 63 to a 4-lane expressway in the future. Therefore, the recommended East Ultimate Build Alignment was broken down into eight improvement projects. The calculation of Order of Magnitude of Costs provided for the Priority Improvements is similar to the Ultimate Build, where quantities of major bid items were estimated for earthwork, pavement, modified subbase, granular and paved shoulders, subdrains, box culverts, bridges, and right-of-way acquisition. A ±25% factor was used to estimate miscellaneous construction items such as clearing and grubbing, pavement removal, median culverts, revetment material, signage, lighting, guardrails, seeding and mulching, and silt fence.

The typical cross section used for calculating the quantities included:

- 34' width for Modified Subbase
- Two 4' wide granular shoulders
- Two 4' wide HMA shoulders
- 24' for 10" PCC Pavement

The envisioned East Ultimate Build Alignment had both Priority I and III designated access along U.S. Highway 63. The Priority Improvements are planned as Priority III access, which allows at-grade intersections at one-quarter intervals. This eliminated some of the interchanges and side road overpasses that were anticipated with the Ultimate Build Alignments. A more in-depth NEPA study will need to be conducted to determine the actual impacts and costs of each improvement.

Priority 1

- Interchange with U.S. Highway 63 and Iowa Highway 163
- 4-Lane interchange will reduce to new super 2 roadway
- New two lane bridge over Skunk River
- Priority III Access - Interchange at 210th Street eliminated

Priority 2

- Proposed improvements of existing roadway from north side of Montezuma to Interstate 80 to a super-2 roadway, which will correct geometric and sight distance deficiencies
- Corridor Preservation for future Montezuma Bypass

Priority 3

- New super-2 roadway
- Priority III Access – Interchange eliminated

Priority 4

- Proposed roadway improvements to super-2 highway, which will help correct geometric and sight distance deficiencies

Priority 5

- New super-2 roadway
- Two new 2-lane bridges over Skunk River and tributary stream
- Priority III Access – Side road overpass eliminated

Priority 6

- Proposed east bypass of New Sharon with a new super-2 roadway
- New bridge over stream
- Corridor Preservation of East Bypass

Priority 7

- Proposed a new 4-lane expressway
- New interchange with Diamond Trail Road
- New side road overpass of 480th Street
- New interchange with existing U.S. Highway 63 route north of Montezuma

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COSTS

U.S. HIGHWAY 63 IMPROVEMENTS - PRIORITY 1
OSKALOOSA NW BYPASS

ITEM NUMBER	ITEM DESCRIPTION	UNIT OF MEASURE	TOTAL UNITS	UNIT PRICE	EXTENDED COST
1	EARTHWORK	CY	600,000	$ 2	$ 1,200,000
2	MODIFIED SUBBASE	CY	20,500	$ 25	$ 512,500
3	GRANULAR SHOULDER, TYPE A	TON	7,392	$ 20	$ 147,840
4	PAVED SHOULDER, HMA, 6"	SY	19,250	$ 25	$ 481,250
5	PAVEMENT, PCC, 10"	SY	75,000	$ 45	$ 3,375,000
6	PRECAST CONCRETE BOX CULVERT	EA	2	$ 300,000	$ 600,000
7	SUBDRAIN, LONGITUDINAL, 4"	LF	43,000	$ 7	$ 301,000
8	BRIDGE - CREEK	EA	0	$ 750,000	$ -
9	BRIDGE - INTERCHANGE/OVERPASS	EA	1	$ 3,000,000	$ 3,000,000
10	BRIDGE - RIVER	EA	1	$ 3,750,000	$ 3,750,000
11	MISCELLANEOUS CONSTRUCTION ITEMS	LS	1	$ 2,632,410	$ 2,632,410

SUBTOTAL		$ 16,000,000
CONTINGENCY	±25%	$ 4,000,000
TOTAL CONSTRUCTION COST		**$ 20,000,000**
PRELIMINARY ENGINEERING AND GEOTECHNICAL	±8%	$ 1,600,000
CONSTRUCTION ENGINEERING	±6%	$ 1,200,000
RIGHT-OF-WAY ACQUISITION		$ 2,300,000
TOTAL PROJECT COST		**$ 25,100,000**

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COSTS

U.S. HIGHWAY 63 IMPROVEMENTS - PRIORITY 2
MONTEZUMA TO I-80 IMPROVEMENTS AND MONTEZUMA BYPASS CORRIDOR PRESERVATION

ITEM NUMBER	ITEM DESCRIPTION	UNIT OF MEASURE	TOTAL UNITS	UNIT PRICE	EXTENDED COST
1	EARTHWORK	CY	1,950,400	$ 2	$ 3,900,800
2	MODIFIED SUBBASE	CY	32,899	$ 25	$ 822,480
3	GRANULAR SHOULDER, TYPE A	TON	7,066	$ 20	$ 141,312
4	PAVED SHOULDER, HMA, 6"	SY	27,379	$ 25	$ 684,480
5	PAVEMENT, PCC, 10"	SY	101,568	$ 45	$ 4,570,560
6	PRECAST CONCRETE BOX CULVERT	EA	0	$ 300,000	$ -
7	SUBDRAIN, LONGITUDINAL, 4"	LF	63,700	$ 7	$ 445,900
8	BRIDGE - CREEK	EA	0	$ 750,000	$ -
9	BRIDGE - INTERCHANGE/OVERPASS	EA	0	$ 3,000,000	$ -
10	BRIDGE - RIVER	EA	0	$ 7,500,000	$ -
11	MISCELLANEOUS CONSTRUCTION ITEMS	LS	1	$ 2,434,468	$ 2,434,468

SUBTOTAL		$ 13,000,000
CONTINGENCY	±25%	$ 3,200,000
TOTAL CONSTRUCTION COST		**$ 16,200,000**
PRELIMINARY ENGINEERING AND GEOTECHNICAL	±8%	$ 1,300,000
CONSTRUCTION ENGINEERING	±6%	$ 1,000,000
RIGHT-OF-WAY ACQUISITION FOR MONTEZUMA TO I-80		$ 2,730,000
CORRIDOR PRESERVATION OF MONTEZUMA BYPASS		$ 750,000
TOTAL PROJECT COST		**$ 21,980,000**

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COSTS

U.S. HIGHWAY 63 IMPROVEMENTS - PRIORITY 3
NEW SHARON SUPER 2 HIGHWAY BYPASS

ITEM NUMBER	ITEM DESCRIPTION	UNIT OF MEASURE	TOTAL UNITS	UNIT PRICE	EXTENDED COST
1	EARTHWORK	CY	964,000	$ 2	$ 1,928,000
2	MODIFIED SUBBASE	CY	24,000	$ 25	$ 600,000
3	GRANULAR SHOULDER, TYPE A	TON	7,310	$ 20	$ 146,200
4	PAVED SHOULDER, HMA, 6"	SY	23,300	$ 25	$ 582,500
5	PAVEMENT, PCC, 10"	SY	69,300	$ 45	$ 3,118,500
6	PRECAST CONCRETE BOX CULVERT	EA	1	$ 300,000	$ 300,000
7	SUBDRAIN, LONGITUDINAL, 4"	LF	40,100	$ 7	$ 280,700
8	BRIDGE - CREEK	EA	0	$ 750,000	$ -
9	BRIDGE - INTERCHANGE/OVERPASS	EA	0	$ 3,000,000	$ -
10	BRIDGE - RIVER	EA	0	$ 7,500,000	$ -
11	MISCELLANEOUS CONSTRUCTION ITEMS	LS	1	$ 1,744,100	$ 1,744,100

SUBTOTAL		$ 8,700,000
CONTINGENCY	±25%	$ 2,200,000
TOTAL CONSTRUCTION COST		**$ 10,900,000**
PRELIMINARY ENGINEERING AND GEOTECHNICAL	±8%	$ 900,000
CONSTRUCTION ENGINEERING	±6%	$ 700,000
RIGHT-OF-WAY ACQUISITION		$ 1,680,000
TOTAL PROJECT COST		**$ 14,180,000**

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COSTS

U.S. HIGHWAY 63 IMPROVEMENTS - PRIORITY 4: OSKALOOSA TO NEW SHARON
SUPER 2 HIGHWAY

ITEM NUMBER	ITEM DESCRIPTION	UNIT OF MEASURE	UNIT	UNIT PRICE PER MILE	EXTENDED COST
1	EARTHWORK (OVERLAY & WIDENING)	Mile	1.95	$ 185,000	$ 360,800
2	EARTHWORK (FULL RECONSTRUCTION)	CY	995,000	$ 2	$ 1,990,000
3	MODIFIED SUBBASE (OVERLAY & WIDENING)	Mile	1.95	$ 80,000	$ 156,000
4	MODIFIED SUBBASE (FULL RECONSTRUCTION)	CY	19,600	$ 25	$ 490,000
5	GRANULAR SHOULDER, TYPE A (OVERLAY & WIDENING)	Mile	1.95	$ 30,000	$ 58,500
6	GRANULAR SHOULDER, TYPE A (FULL RECONSTRUCTION)	TON	5,400	$ 20	$ 108,000
7	PAVED SHOULDER, HMA, 6" (OVERLAY & WIDENING)	Mile	1.95	$ 140,000	$ 273,000
8	PAVED SHOULDER, HMA, 6" (FULL RECONSTRUCTION)	SY	22,000	$ 25	$ 550,000
9	PAVEMENT, PCC, 10" (OVERLAY & WIDENING)	Mile	1.95	$ 300,000	$ 585,000
10	PAVEMENT, PCC, 10" (FULL RECONSTRUCTION)	SY	71600	$ 45	$ 3,222,000
11	PRECAST CONCRETE BOX CULVERT	EA	1.95	$ 300,000	$ 585,000
12	SUBDRAIN, LONGITUDINAL, 4" (OVERLAY & WIDENING)	Mile	1.95	$ 25,000	$ 48,800
13	SUBDRAIN, LONGITUDINAL, 4" (FULL RECONSTRUCTION)	LF	24800	$ 7	$ 173,600
14	BRIDGE - CREEK	EA	0	$ 750,000	$ -
15	BRIDGE - INTERCHANGE/OVERPASS	EA	0	$ 3,000,000	$ -
16	BRIDGE - RIVER	EA	0	$ 3,750,000	$ -
17	MISCELLANEOUS CONSTRUCTION ITEMS	LS	1	$ 2,399,300	$ 2,399,300

SUBTOTAL		$ 11,000,000
CONTINGENCY	±25%	$ 2,800,000
TOTAL CONSTRUCTION COST		**$ 13,800,000**
PRELIMINARY ENGINEERING AND GEOTECHNICAL	±8%	$ 1,100,000
CONSTRUCTION ENGINEERING	±6%	$ 800,000
RIGHT-OF-WAY ACQUISITION		$ 1,610,000
TOTAL PROJECT COST		**$ 17,310,000**

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COSTS

U.S. HIGHWAY 63 IMPROVEMENTS - PRIORITY 5: NEW SHARON TO MONTEZUMA
SUPER 2 HIGHWAY

ITEM NUMBER	ITEM DESCRIPTION	UNIT OF MEASURE	TOTAL UNITS	UNIT PRICE	EXTENDED COST
1	EARTHWORK	CY	1,071,600	$ 2	$ 2,143,200
2	MODIFIED SUBBASE	CY	27,400	$ 25	$ 685,000
3	GRANULAR SHOULDER, TYPE A	TON	8,090	$ 20	$ 161,800
4	PAVED SHOULDER, HMA, 6"	SY	25,700	$ 25	$ 642,500
5	PAVEMENT, PCC, 10"	SY	100,200	$ 45	$ 4,509,000
6	PRECAST CONCRETE BOX CULVERT	EA	2	$ 300,000	$ 600,000
7	SUBDRAIN, LONGITUDINAL, 4"	LF	57,800	$ 7	$ 404,600
8	BRIDGE - CREEK	EA	1	$ 750,000	$ 750,000
9	BRIDGE - INTERCHANGE/OVERPASS	EA	0	$ 3,000,000	$ -
10	BRIDGE - RIVER	EA	1	$ 3,750,000	$ 3,750,000
11	MISCELLANEOUS CONSTRUCTION ITEMS	LS	1	$ 3,353,900	$ 3,353,900

SUBTOTAL		$ 17,000,000
CONTINGENCY	±25%	$ 4,300,000
TOTAL CONSTRUCTION COST		**$ 21,300,000**
PRELIMINARY ENGINEERING AND GEOTECHNICAL	±8%	$ 1,700,000
CONSTRUCTION ENGINEERING	±6%	$ 1,300,000
RIGHT-OF-WAY ACQUISITION		$ 2,490,000
TOTAL PROJECT COST		**$ 26,790,000**

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COSTS

U.S. HIGHWAY 63 IMPROVEMENTS - PRIORITY 6: MALCOM TO HWY 6
SUPER 2 HIGHWAY

ITEM NUMBER	ITEM DESCRIPTION	UNIT OF MEASURE	TOTAL UNITS	UNIT PRICE	EXTENDED COST
1	EARTHWORK	CY	1,101,500	$ 2	$ 2,203,000
2	MODIFIED SUBBASE	CY	26,300	$ 25	$ 657,500
3	GRANULAR SHOULDER, TYPE A	TON	7,750	$ 20	$ 155,000
4	PAVED SHOULDER, HMA, 6"	SY	36,900	$ 25	$ 922,500
5	PAVEMENT, PCC, 10"	SY	96,000	$ 45	$ 4,320,000
6	PRECAST CONCRETE BOX CULVERT	EA	4	$ 300,000	$ 1,200,000
7	SUBDRAIN, LONGITUDINAL, 4"	LF	55,400	$ 7	$ 387,800
8	BRIDGE - CREEK	EA	1	$ 750,000	$ 750,000
9	BRIDGE - INTERCHANGE/OVERPASS	EA	0	$ 3,000,000	$ -
10	BRIDGE - RIVER	EA	0	$ 3,750,000	$ -
11	MISCELLANEOUS CONSTRUCTION ITEMS	LS	1	$ 2,404,200	$ 2,404,200

SUBTOTAL		$ 13,000,000
CONTINGENCY	±25%	$ 3,300,000
TOTAL CONSTRUCTION COST		**$ 16,300,000**
PRELIMINARY ENGINEERING AND GEOTECHNICAL	±8%	$ 1,300,000
CONSTRUCTION ENGINEERING	±6%	$ 1,000,000
RIGHT-OF-WAY ACQUISITION		$ 2,390,000
TOTAL PROJECT COST		**$ 20,990,000**

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COSTS

U.S. HIGHWAY 63 IMPROVEMENTS - PRIORITY 7: MONTEZUMA BYPASS
4-LANE HIGHWAY

ITEM NUMBER	ITEM DESCRIPTION	UNIT OF MEASURE	TOTAL UNITS	UNIT PRICE	EXTENDED COST
1	EARTHWORK	CY	3,336,100	$ 2	$ 6,672,200
2	MODIFIED SUBBASE	CY	51,700	$ 25	$ 1,292,500
3	GRANULAR SHOULDER, TYPE A	TON	7,150	$ 20	$ 143,000
4	PAVED SHOULDER, HMA, 6"	SY	58,200	$ 25	$ 1,455,000
5	PAVEMENT, PCC, 10"	SY	189,000	$ 45	$ 8,505,000
6	PRECAST CONCRETE BOX CULVERT	EA	5	$ 300,000	$ 1,500,000
7	SUBDRAIN, LONGITUDINAL, 4"	LF	65,400	$ 7	$ 457,800
8	BRIDGE - CREEK	EA	1	$ 750,000	$ 750,000
9	BRIDGE - INTERCHANGE/OVERPASS	EA	4	$ 3,000,000	$ 12,000,000
10	BRIDGE - RIVER	EA	0	$ 3,750,000	$ -
11	MISCELLANEOUS CONSTRUCTION ITEMS	LS	1	$ 8,224,500	$ 8,224,500

SUBTOTAL		$ 41,000,000
CONTINGENCY	±25%	$ 10,300,000
TOTAL CONSTRUCTION COST		**$ 51,300,000**
PRELIMINARY ENGINEERING AND GEOTECHNICAL	±8%	$ 4,100,000
CONSTRUCTION ENGINEERING	±6%	$ 3,100,000
RIGHT-OF-WAY ACQUISITION		**$ 2,250,000**
TOTAL PROJECT COST		**$ 60,750,000**