US 34 Super Two Corridor Study
Clarke, Lucas, and Monroe Counties

Draft Vision Document

Location and Environment Bureau | March 2024

EXECUTIVE SUMMARY

The Iowa Department of Transportation (DOT) performed a Super Two Corridor Study (Study) for a portion of the U.S. Highway 34 (US 34) corridor in Clarke, Lucas, and Monroe Counties in southcentral and southeastern Iowa. The purpose of the Study was to gain an understanding of the corridor's ability to meet current and future travel and mobility needs and to identify any potential improvement projects that may help meet those future needs. The recommendations were determined after evaluating existing corridor for deficiencies, evaluating existing paved and partially paved intersections for turn lane improvement recommendations, identifying existing passing lane locations and potential future needs, and identifying spot roadway locations to address operational or safety concerns.

The Study area is approximately 65 miles long, extending from the western limits of Clarke County to east of the US 34 junction with State Highway 5 (IA 5) near Albia. The section of US 34 is primarily rural and passes through the communities of Osceola, Lucas, Chariton, and Albia. The Study consists of a series of separate analyses and standalone reports including *US 34 Super Two Study: Planning Framework Goals and Guiding Principles* (Jacobs, 2023a), *US 34 Super Two Study: Existing Crash and Safety Performance Report* (Jacobs, 2023b), and *US 34 Super Two Study: Existing Conditions Memorandum* (Jacobs, 2023c).The findings of these various studies and public outreach activities are culminated in this Vision Document, which sets forth recommendations for future study and investment in the US 34 corridor.

RECOMMENDATIONS

- **INTERSECTION TURN LANE IMPROVEMENTS**

The findings of the Study recommend improving some of the existing turn lanes and proposes new turn lanes at many of the fully paved or partially paved intersections. Currently, there are an estimated 436 points of access along US 34 in the Study corridor, including 115 intersections; the greatest density of access points is in or near the communities along the corridor. Based on the turn lane evaluation, there are 17 locations where new minor right-turn lanes are proposed. There are three locations where it is recommended that a minor right-turn lane storage be lengthened to provide a major right-turn lane with an offset. There are 11 locations where a new left-turn lane is proposed. There are an additional five locations where an offset left-turn lane is proposed. Of the proposed right and left-turn lanes, all are proposed on US 34 at paved crossroads.

- **SUPER TWO PROPOSED PASSING LANE LOCATIONS**

The findings of the Study recommend adding passing lanes in 14 locations. There are seven passing lanes proposed in the eastbound direction and seven in the westbound direction. Additionally, six existing climbing lanes are recommended to be lengthened to meet current criteria. This includes two in the eastbound direction and four in the westbound direction.

- **SPOT ROADWAY IMPROVEMENTS**

The findings of the Study recommend several spot improvements along US 34 to provide clearer sightlines and improved visibility for motorists; to create a more consistent travel speed; and to assist drivers in navigating roadways and sideroads. In addition, resiliency spot

improvements would help US 34 withstand and recover from flood and winter storm events and reduce the maintenance needs during these occurrences. The spot improvements include shoulder widening, snow fencing or snow borrow, highway profile adjustments, protective guardrails, improved roadway signage, ditch regrading, and drainage improvements.

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ACRONYMS AND ABBREVIATIONS

AADT	Annual Average Daily Traffic
BNSF	Burlington Northern Santa Fe
DOT	Department of Transportation
I-35	Interstate 35
IA 14	State Highway 14
IA 5	State Highway 5
MP	Mile Post
mph	Mile(s) per Hour
PCR	Potential Crash Reduction
PIM	Public Involvement Meeting
PGR	Progressive Rail
PMT	Project Management Team
ROW	Right of Way
Study	Super Two Corridor Study
TEAP	Traffic Engineering Assistance Program
TWLTL	Two-Way Left-Turn Lane
UP	Union Pacific
US 34	U.S. Highway 34
US 65	U.S. Highway 65
US 69	U.S. Highway 69
vpd	Vehicle(s) per Day

1 INTRODUCTION

The Iowa Department of Transportation (DOT) performed a Super Two Corridor Study (Study) for a portion of the U.S. Highway 34 (US 34) corridor that extends from the western border of Clarke County, traverses through Lucas County, and ends in central Monroe County. This portion of US 34 is in southcentral and southeastern Iowa. This Study follows the Iowa DOT Super Two design guidance related to passing lanes, turning lanes, access management, shoulder design, signing and pavement markings, and rumble strips.

1.1 STUDY OVERVIEW

The objective of the Study is to gain an understanding of the corridor's safety, mobility, and infrastructure conditions, as well as identify recommendations for Super Two roadway improvements necessary to meet current and future traffic operations and mobility needs. It is also intended to encourage public involvement and stakeholder input. The two-lane highway roadway recommendations primarily focused on turning and passing lane additions. Other spot highway roadway improvements will also be recommended in certain areas to help improve the transportation corridor.

This Study will not be followed directly by a programmed or "funded" project but will result in recommended components that can be incorporated into smaller-scale projects that may be constructed in the future. Future projects will include further evaluation and may modify some of the recommended improvements accordingly.

This report summarizes the Study's findings and recommendations. The Study consists of a series of separate analyses and standalone reports, with the various Study results and findings culminating in this Vision Document. The Study includes the following technical reports:

- *US 34 Super Two Study: Planning Framework Goals and Guiding Principles* (Jacobs, 2023a)
- *US 34 Super Two Study: Existing Crash and Safety Performance Report* (Jacobs, 2023b)
- *US 34 Super Two Study: Existing Conditions Memorandum* (Jacobs, 2023c)

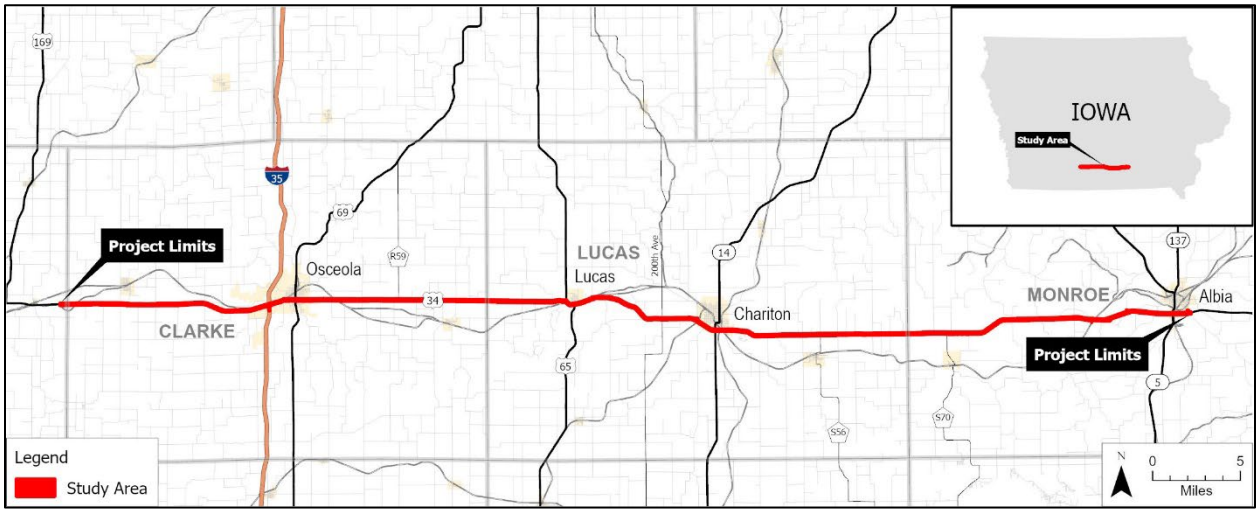
1.2 STUDY AREA

In Iowa, US 34 was one of the original U.S. highways when the system was created in 1926 and the first road to be fully paved across the state. Over the years, the roadway has been straightened and widened to accommodate increased traffic and larger vehicles. In 1992, Iowa DOT designated all of US 34 as the Red Bull Highway in honor of the 34th Infantry Division. US 34 is part of the Iowa primary road system and extends across the southern third of the state in southcentral and southeastern Iowa. US 34 is part of Iowa's Commercial and Industrial Network that was identified by the state legislature to enhance opportunities for the development and diversification of the state's economy. Additionally, in the 2017 *Iowa in Motion 2045: State Transportation Plan*, US 34 was designated as one of five critical two-lane routes that should receive a conservative application of the Super Two concepts (Iowa DOT, 2017).

Figure 1 shows the approximately 65-mile-long Study area, which extends from the western limits of Clarke County to approximately 1 mile east of the US 34 junction with State Highway 5 (IA 5) near Albia. US 34 is a primary east-west highway that connects with major

north-south interstate and primary highway corridors, including Interstate 35 (I-35) on the western side of Osceola. The Study area traverses Clarke, Lucas, and Monroe Counties, which are under the oversight of Iowa DOT District 5.

Figure 1. US 34 Super Two Study Area



The US 34 Super Two corridor is predominantly a two-lane highway with rural characteristics that include roadside ditches and frequent access points. US 34 passes through or near the communities of Murray, Osceola, Lucas, Chariton, and Albia. In general, the existing US 34 rural roadway characteristics are consistent through the various communities in the Study corridor, except in Osceola, where US 34 becomes an urban roadway through town with a single through lane in each direction, a center median to provide two-way left turns, a closed drainage system with curbs and gutters, and sidewalks. Existing US 34 transitions to a four-lane divided roadway at key crossroads, including I-35 on the western side of Osceola, State Highway 14 (IA 14) in Chariton, and IA 5 in Albia. There is also a north-south crossing of US 34 with U.S. Highway 65 (US 65), which is staggered, with the north leg located west of Lucas and the south leg located in Lucas.

Within the Study corridor are three rail lines that either run parallel to or cross the Study corridor: Burlington Northern Santa Fe (BNSF), Union Pacific (UP), and Progressive Rail (PGR). The BNSF rail line travels east-west, and generally runs parallel to US 34, sometimes on the northern side of the roadway and sometimes on the southern side. The BNSF rail line crosses under US 34 four times throughout the Study corridor's length, including east of Osceola, in Lucas, in Chariton, and west of Albia. The UP and PGR rail lines generally travel in a north-south direction. The UP rail line crosses under US 34 in Chariton, and the PGR rail line crosses US 34 in Albia. Located 250 feet east of the IA 5 intersection, the PGR existing at-grade rail crossing is equipped with signage, pavement markings, and flashing signals.

The Study evaluated intersection turning movements based on forecast traffic volumes for 2028 and 2048, which had an expected growth of 4 to 6 percent over a 20-year period. After the start of the Study, traffic counts were taken in 2022, which were greater in several locations

than the 2028 forecast data used for analyses. To account for this potential anomaly, analyses that showed borderline results were included in the recommendations.

1.3 GOALS AND GUIDING PRINCIPLES

The goals and outcomes of the Study are expected to closely align with the improvement strategies and focus areas defined in the *State Transportation Plan: Iowa in Motion 2050 (*Iowa DOT, 2022), including the following:

- Right-size the highway system and apply cost-effective solutions to locations with existing and anticipated issues.
- Target investments to address mobility and safety needs on critical two-lane routes.
- Reduce the number of overall major and minor crashes.
- Maximize the use of existing roadway capacity.

The goal of this document is to summarize recommendations for two-lane highway roadway improvements within the Study area. These roadway improvements are intended to increase the operational performance, safety performance, and mobility within this corridor. This Study will recommend roadway improvements throughout the corridor to be incorporated into future projects and will focus primarily on the following objectives:

- Identifying proposed new turn lanes and upgrading existing turn lanes
- Identifying proposed passing lane locations
- Identifying spot roadway improvements

This Study addresses the goals by following three primary guiding principles:

1. Good Stewardship and Resiliency—Provide a safe and efficient transportation system while being good environmental stewards and appropriately using Iowa tax dollars.

2. Transparency—Provide an open and transparent project process where findings are shared publicly, and stakeholders have continuous opportunities to offer input on the project.

3. Design Principles—Maintain a transportation network that aligns with core design principles and anticipates needs for the year 2048.

2 EXISTING CONDITIONS ANALYSIS

This section summarizes the major findings of the various existing condition studies. The following technical reports provide additional details:

- *US 34 Super Two Study: Existing Crash and Safety Performance Report (Jacobs, 2023b)*
- *US 34 Super Two Study: Existing Conditions Memorandum (Jacobs, 2023c)*

2.1 INITIAL STAKEHOLDER OUTREACH

Early in the Study, three small group meetings were held with the local jurisdictions and other US 34 stakeholders. Based on recommendations from participants at these three meetings, two additional meetings were held: one with Lucas County Development Corporation to discuss business use of the US 34 corridor and one with the Clarke County Amish Community to gain a

better understanding of the unique needs of this community that uses horses and buggies on the roadway. Table 1 lists the small group meetings that were held.

Table 1. Small Group Meetings

Stakeholder Group	Meeting Date
Monroe County and City of Albia (in person)	August 16, 2022
Lucas County and City of Chariton (in person)	August 17, 2022
Clarke County, City of Osceola, and City of Murray (in person)	August 17, 2022
Clarke County Amish Community (in person)	February 28, 2023
Lucas County Development Corporation	April 13, 2023

The small group meetings were conducted to inform participants about the Study's location, purpose, process, and potential alternatives. The goal was to gather feedback from agencies and stakeholders on the current functionality and future needs of the US 34 corridor and to discuss potential solutions to address the transportation needs. Public input was collected at these small group meetings, and Super Two-type improvements were generally supported. One agency (Southern Iowa Council of Governments) stated that, rather than a Super Two roadway, a four-lane roadway should be a priority for this corridor. Appendix A contains the small group meeting summaries. Section 3 provides a summary of the public outreach effort.

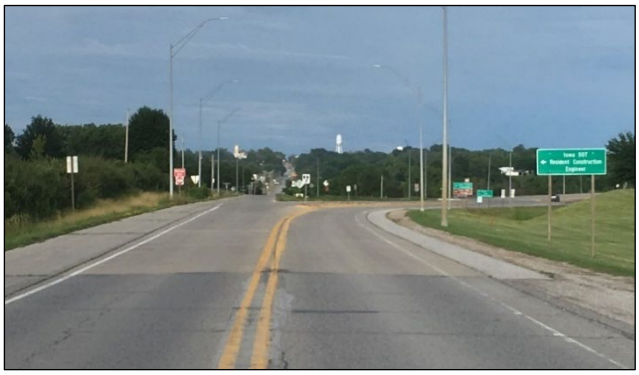
2.2 PROJECT MANAGEMENT TEAM COORDINATION

In addition to the small group meetings, an internal Iowa DOT project management team (PMT) meeting was held on November 8, 2023. Staff from the Location and Environment, Design, Traffic and Safety, Modal, and Bridge and Structures Bureaus as well as District 5 attended the PMT meeting. The Federal Highway Administration was also invited to attend the meeting but was unable to attend. The PMT reviewed the proposed intersection improvements, spot improvements, and Super Two corridor alternatives. Following the PMT meeting, District 5 provided follow-up comments and direction, which were used to finalize the proposed improvements.

2.3 EXISTING INFRASTRUCTURE CONDITIONS AND FEATURES

The *US 34 Super Two Study: Existing Conditions Memorandum* (Jacobs, 2023c) analyzed the existing corridor's infrastructure conditions and features. Overall, the corridor features are within today's acceptable design parameters. Only isolated locations contain roadway features that do not align with current design practices. Key findings are described in this section.

- On the western side of Chariton, as a vehicle is traversing along US 34 eastbound, the Court Avenue westbound roadway pavement and lighting creates a potential visual trap as shown in the graphic. This visual trap gives the appearance that US 34 eastbound continues straight into downtown Chariton, and it is difficult to see the Court Avenue intersection located within the horizontal curve. To an inattentive driver or during periods where visibility may be limited, this potential visual trap could lead to run-off-the-road or cross-centerline crashes. There is a history of crashes within the segment leading up to the horizontal curve of the roadway, although it is inconclusive whether they are a direct result of the potential visual trap.



US 34 eastbound potential visual trap; Court Avenue westbound entrance in Chariton (looking east)

- Seven locations within the Study corridor have vertical grades (slopes) that are greater than the 5 percent acceptable maximum vertical grade for new construction. Ten locations within the Study corridor could see a reduction in truck travel speed between 5 and 10 miles per hour (mph). Four of these 10 locations have an existing additional lane for passing. Locations that are expected to result in speed reductions between 5 and 10 mph that have not been mitigated with an existing climbing lane are summarized as follows:

  – East of Osceola, between mile post (MP) 117 and MP 118, there is a 1,270-foot segment of road with a 4.3 percent grade. This segment of US 34 is uphill approaching Osceola (westbound), and there is a posted speed transition from 55 to 35 mph over this same segment. In the westbound direction, the increase in elevation aligns with the 20-mph posted speed transition.

  – From Lucas to Chariton, between MP 136 and MP 137, there is a 2,100-foot segment of road with a 3.0 percent grade (westbound).

  – East of Chariton, near MP 143, there is a 900-foot segment of road with a 5.0 percent grade (eastbound).

  – West of Albia, there are three roadway grades: one near MP 162 with a 4.0 percent grade (westbound) for 1,250 feet, one near MP 163 with a 4.2 percent grade (westbound) for 1,500 feet, and one near MP 165 with a 4.3 percent grade (westbound) for 1,700 feet.

- All passing/climbing lanes within the Study corridor are shorter in length than the minimum guidelines for Super Two highways provided in the *Iowa DOT Design Manual* (Iowa DOT, 2023).

- Two locations have less than acceptable decision sight distance: one within Osceola and one just outside of Lucas.

- The existing infrastructure primarily has fair to good pavement conditions, with only 1.5 miles of poor pavement noted at locations within Osceola and just east of Lucas. A recent resurfacing project within Osceola may improve the current pavement conditions rating. All existing bridges appear to be in reasonable condition, and none are currently posted for weight restrictions or considered deficient. Bridge inspection reports suggest that two bridges are scheduled for bridge deck overlays in 2023, one bridge is scheduled for replacement in 2026, and one bridge is currently being replaced.

- The existing US 34 roadway meets current design practices and policies with isolated locations that may be considered less than ideal. These areas involve geometrics, turn lane tapers, intersection alignment, and sight distance needs.

- Twelve-foot travel lanes with 10-foot shoulders are provided along most of the Study corridor. Of the 10-foot shoulders, 4 feet are paved and 6 feet are granular material. This is a concern within the segment from Murray to Osceola, where the partially paved shoulders are difficult for horse-drawn buggies to use. Within Monroe County, there are 8-foot shoulders (varies between partially and fully paved) for approximately 12 miles from 520th Avenue east to Albia.

Monroe County existing shoulders

2.4 CRASH HISTORY AND SAFETY

The *US 34 Super Two Study: Existing Crash and Safety Performance Report* (Jacobs, 2023b) analyzed the crash history and safety analysis for the last 5 full years (2017 to 2021) of crash data available at the time of the analysis. A total of 478 crashes occurred within the Study area. Of those, 5 were fatal crashes, 54 were serious or minor injury crashes, and the remainder were property damage only crashes. The fatal crashes that occurred at the following locations were not believed to be the result of roadway conditions:

- US 34 at 277th Avenue intersection (2017)—head-on collision resulting from motor home crossing the centerline; involved drugs and alcohol

- US 34 at 1st Street intersection (2018)—failure to yield right of way (ROW) while making a left turn

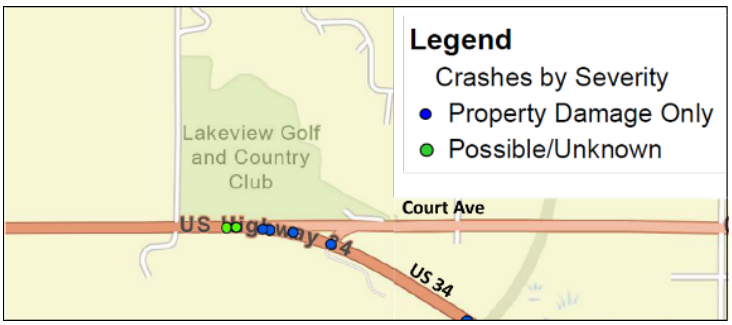
- US 34 east of 160th Avenue (2018)—non-intersection crash caused by an evasive maneuver

- US 34 west of County Road R25/Lacelle Road/180th Avenue (2018)—non-intersection, head-on collision

- US 34 east of Albia Road (2019)—non-intersection crash caused by failure to yield ROW at a driveway; motorcycle lost control to avoid contact with an unidentified vehicle in the roadway

There were other fatal crashes that occurred either outside of the Study area (just west of Clarke-Union Avenue) or outside of the reporting period (in 2015). The 2015 crash within the Study area occurred at the intersection of US 34 and County Road H35/204th Trail and was a run-off-the-road crash.

Over the reporting period, there were six crashes that occurred near Court Avenue, two of which resulted in possible injuries. The combination of the US 34 existing horizontal curve with the Court Avenue westbound entrance and intersection is not ideal. As previously discussed, there is a potential visual trap in the eastbound direction. In the westbound direction, Court Avenue carries a significant amount of truck traffic that is entering onto US 34 westbound via a ramp with less than desirable merge length and entering on an incline.



US 34 at Court Avenue Crash History

The predicted number of crashes for a given traffic volume is based on the relationship between the observed number of crashes and annual average daily traffic (AADT) volume. For most specific locations, the observed number of crashes is likely to be greater than or less than the predicted number calculated by the safety performance functions. The observed crash count is then corrected, using the Empirical Bayes method, resulting in the expected number of crashes at that location. The difference between the expected number of crashes and the predicted number of crashes gives the potential for safety improvement, also known as potential crash reduction (PCR). Comparing PCR values helps to normalize the crash data by accounting for exposure for a crash to occur. By normalizing the data with traffic volumes, areas can be compared while minimizing the bias created by varying levels of traffic on individual roadway segments and intersections.

PCR values are categorized as either high, medium, or low. High PCR level intersections or segments represent locations in which the rate of crashes is greater than the statewide average. Medium PCR level intersections or segments have room for improvement and may qualify for safety funds. Low PCR level intersections or segments are performing better than expected.

In total, 13 segments and 21 intersections were found to have PCR values greater than those of comparable U.S. highways in Iowa. Specific locations are noted on the corridor exhibits in Appendix E. The analysis found in the *US 34 Super Two Study: Existing Crash and Safety Performance Report* (Jacobs, 2023b) was used to inform the decision-making process alternative evaluation; however, safety was not the primary driving factor for the recommendations found in this report.

2.5 ENVIRONMENTAL CONSTRAINTS AND CONCERNS

A desktop review of known environmental and cultural constraints was conducted as part of the Study. The desktop review focused on environmental areas such as floodplains, wetlands, woodland areas, recreational areas, waterways/protected rivers, sovereign lands, and regulated materials sites. The review also looked at the cultural and community constraints, such as cemeteries and churches.

US 34 has several water crossings within the Study area. These include White Breast Creek and its branches, Cedar Creek, Coal Creek, and Little White Breast Creek. Other potential constraints throughout the corridor include state and local recreation lands, wetlands, floodplains, threatened and endangered species habitats, and cultural resources. For more information on these constraints see Appendix D.

There are five locations along the Study corridor where stakeholders noted specific concerns related to standing water and waterbodies. All five of these areas will need to be analyzed further as part of future studies:

- Through Lucas between MP 131 and MP 135, US 34 experiences overtopping and standing water during precipitation events that raise the elevation of White Breast Creek and the surrounding floodplain. In addition, the south leg of US 65 has standing water during precipitation events. Together, these issues create challenges for east-west and north-south travel.

- On the west side of Chariton between Court Avenue and IA 14 (Main Street) between MP 140 and MP 141.5, US 34 experiences standing water during precipitation events that raise the elevation of the Chariton River and affect the surrounding floodplain.

- Just east of Chariton, near Red Haw Lake and Lake Ellis, which are connected by a waterway that passes under US 34 between MP 143 and MP 144, there is occasional standing water on the roadway.

- Between MP 144 and MP 145.5, US 34 experiences standing water during precipitation events that raise the elevation of Lake Morris and the surrounding floodplains.

- Near Cedar Creek, west of Albia between MP 165 and MP 167, US 34 experiences standing water during precipitation events within the surrounding floodplain.

During some snow events, drifting snow can occur along the flat areas of US 34 between MP 138 and MP 139 and between MP 145 and MP 155. This drifting snow can affect drivability.

Appendix D represents the results of the environmental desktop review within the Study area. Areas of spot improvements to address resiliency issues are noted in Appendix E.

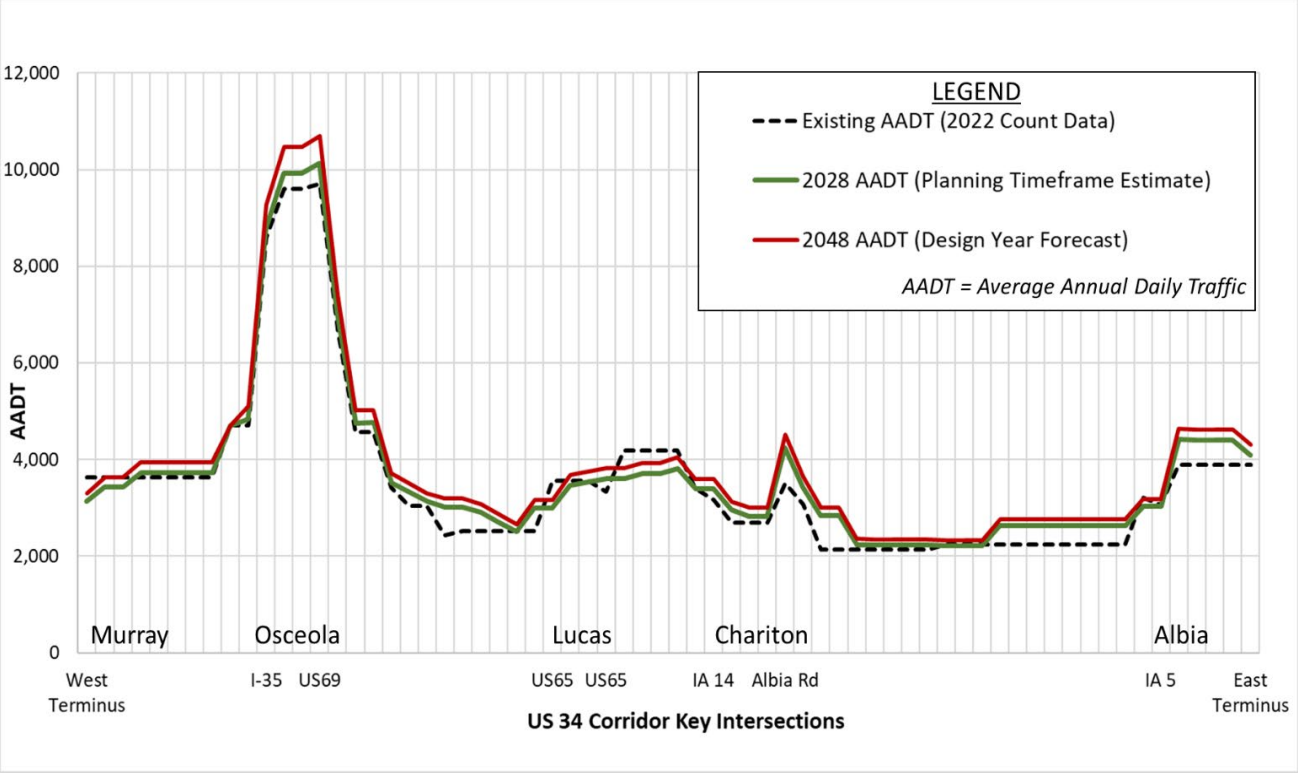
3 EXISTING AND FORECAST TRAVEL DEMAND

The traffic volumes along the US 34 corridor fluctuate based on population density (urban or rural) and crossing roadways. For the purpose of the operational analyses, planning framework year 2028 and forecast year 2048 AADT volumes, along with intersection peak hour turning movement volumes, were used to determine the proposed improvements. The growth between 2028 and 2048 ranges from 4 to 6 percent over the 20-year period. The highest forecast AADT is within Osceola and ranges from 9,300 to 10,700.

After the start of the Study, 2022 traffic counts were taken along the US 34 corridor, and new 2022 AADT volumes (existing traffic) became available.

Figure 2 provides an overview of the AADT volumes based on 2022 existing conditions, 2028 planning timeframe, and 2048 forecast year. In most segments, the existing traffic is slightly less than the 2028 planning AADT. However, in a few locations, such as the segment between Lucas and Chariton, the existing counts were greater than the projected 2028 and 2048 forecast data. To account for this potential anomaly, analyses that showed borderline results were included in the recommendations.

Figure 2. US 34 Existing (2022) and Planning (2028 and 2048) AADT



The highest existing (2022) traffic volumes are in Osceola between the I-35 interchange and U.S. Highway 69 (US 69) intersection, ranging from 8,600 to 9,700 vehicles per day (vpd). In 2048, the forecast volumes will exceed 10,000 vpd.

The lowest AADT volumes are between Chariton and Albia and range from approximately 2,200 to 2,650 vehicles. The highest rural section with an AADT volume of 3,900 vehicles is east of Albia.

4 PUBLIC INVOLVEMENT PROCESS AND INPUT

Early in the Study, a public involvement plan was developed to guide the public involvement process for the Study and identify opportunities for the public to provide ideas and comments regarding the development of the Study. The plan included a range of communication channels, online public involvement meetings (PIMs), stakeholder/small group meetings, and email or postal mail communications. The primary avenues for public engagement and feedback collection were small group meetings (Section 2.1) and PIMs.

Two PIMs were held during the Study. The first was a hybrid in-person and virtual meeting, and the second was a virtual meeting (no in-person meeting). Each meeting was posted on the Iowa DOT's website, including a video and opportunity to provide comments. Meetings were announced through the Study email distribution, newspaper advertising, and other media releases including Facebook notifications. A summary of the Study's public meetings, including the meeting logistics and topics, are presented in the sections that follow.

4.1 PUBLIC INVOLVEMENT MEETING #1

PIM #1 was hosted in person on November 16, 2022, at the Chariton City Community Center in Chariton, as well as online through the Iowa DOT's public involvement website. The public meeting materials were available for viewing from November 16 through November 28, 2022. The public comment period ended on December 5, 2022. The PIM consisted of a prepared presentation, complete with audio, that shared information about the Study process, goals and objectives, results from initial data gathering, and existing conditions analysis.

There were more than 60 attendees at the in-person meeting, and 24 attended and viewed the virtual PIM. Sixteen comments were submitted to Iowa DOT; comments and responses are provided in Appendix B.

4.2 PUBLIC INVOLVEMENT MEETING #2

To be completed after PIM #2.

5 RECOMMENDATIONS

The following recommendations address the overarching goals of the Study. The basis for these recommendations is a combination of the findings and observations of the various topical studies performed as part of this Study and input received from the public and project stakeholder groups. Practical-based design methods were used in determining recommendations within the Study area. The following Traffic Engineering Assistance Program (TEAP) studies, previously prepared for the City of Osceola, had recommendations for proposed improvements at the intersections with Warren Avenue and US 69 that have been incorporated into this report.

- *US 69 – Pearl Street to BNSF RR Crossing Corridor Study*, Section 6 Conclusions/Recommendations, Exhibits 5-8 (Snyder & Associates, 2020)

- *City of Osceola Traffic and Safety TEAP Study*, Section Roadway/Intersection Geometry Modifications, Exhibit 4 Pavement Marking Modifications and Additions (HR Green, 2019)

5.1 INTERSECTION TURN LANE IMPROVEMENTS

Intersections on the rural two-lane highway were evaluated in accordance with *Iowa DOT Design Manual* policies in Chapters 6A-1 and 6C-2 (Iowa DOT, 2023). Chapter 9 of *A Policy on Geometric Design of Highways and Streets* (AASHTO, 2018) was also considered, along with the 5-year crash history of collisions and PCR locations identified by Iowa DOT. The following are some of the key criteria:

- Within the rural sections, all partially and fully paved intersections are recommended to have a minimum of a minor right-turn lane in accordance with the *Iowa DOT Design Manual* policies in Chapter 6C-2 (Iowa DOT, 2023). For partially paved intersections, only the paved leg of the intersection requires a minor right-turn lane.

- Left-turn lane warrants for a two-lane highway within urban and suburban areas were evaluated using the figure from *NCHRP Report 745: Left-Turn Accommodations at Unsignalized Intersections* on pages 9 and 10 (Left Turn Lanes) (TRB, 2013). There is also guidance for the geometric design of left-turn bays, offset left turns, and bypass lanes that were applied as part of the corridor recommendations.

- Where there is an existing or proposed left-turn lane in one direction of travel, a symmetrical left-turn lane configuration should be provided in accordance with *Iowa DOT Design Manual* policies in Chapter 6A-1 (Iowa DOT, 2023). This would provide a left-turn lane in both directions of travel. Symmetrical turn lanes should be recommended on an individual intersection basis.

Traffic forecasts for paved or partially paved intersections were provided by the Iowa DOT Systems Planning Bureau. Right-turn lanes were evaluated for Program Year 2028. Left-turn lanes were evaluated for Design Year 2048. Most gravel intersections have historically low traffic volumes and were not considered for turn lanes.

Existing channelized turning movements and dedicated right-turn lanes were also analyzed to determine whether the existing turn bay length and taper rate were adequate or needed to be upgraded. Figure 3 provides an illustration of a typical turn bay and taper section.

In urban areas, varying factors, such as reduced in-town speeds, intersection spacing, driveways, and adjacent traffic intersection signals, need to be analyzed in more detail to recommend turn lane improvements. In spot locations, TEAP studies have been conducted. The recommendations from those studies were folded into the proposed improvements.

Of the 115 intersections within the Study area, 53 of the crossroads are paved, 60 are partially paved or gravel, and 2 are dirt roads. Fully paved or partially paved intersections (one or more paved sideroads) with or without existing turn lanes were analyzed in the rural and corporate limits. Based on the findings, turn lane improvements are recommended along the two-lane highway sections.

Table 2 shows the location of existing turn lanes, results of turn lane analyses, and proposed recommendations for new or modified turn lanes within the Study area. Table 3 shows the recommended turn lane taper adjustments needed to meet *Iowa DOT Design Manual* standards (Iowa DOT, 2023). Appendix E includes a series of maps that include the turn lane analysis, along with other roadway improvements, which are discussed later in this section.

Table 2. Turn Lane Analysis

Intersection Location on US 34	US 34 Direction of Travel	Left/ Right	Existing Turn Lane Present	Turn Lane Warrant	Recommendations	Crossroad Characteristics	City/ County
Clarke-Union Avenue	EB	Left	No	No	No Recommendation	Rural, Existing Gravel (N/S)	W. of Murray/ Clarke
	EB	Right	No	No	No Recommendation		
	WB	Left	No	No	No Recommendation		
	WB	Right	No	Yes	No Recommendation[h]		
130th Avenue (County Road R15)	EB	Left	No	No	No Recommendation	Rural, Paved (N/S)	Murray/Clarke
	EB	Right	Yes	Yes	Existing Turn Lane Adequate[c]		
	WB	Left	No	No	No Recommendation		
	WB	Right	Yes	Yes	Existing Turn Lane Adequate		
135th Avenue (County Road R16)	EB	Left	No	No	No Recommendation	Rural, Paved (N only)	Murray/Clarke
	WB	Right	Yes	Yes	Upgrade from Minor to Major Right[e & f]		
180th Avenue/ Lacelle Road (County Road R25)	EB	Left	No	Yes[b]	Left Turn	Rural, Paved (N/S)	W. of Osceola/ Clarke
	EB	Right	No	Yes[a]	Minor Right		
	WB	Left	No	Yes	Left Turn		
	WB	Right	No	Yes	Minor Right		

Table 2. Turn Lane Analysis

Intersection Location on US 34	US 34 Direction of Travel	Left/ Right	Existing Turn Lane Present	Turn Lane Warrant	Recommendations	Crossroad Characteristics	City/ County
205th Avenue	EB	Left	No	No	No Recommendation	Rural, Gravel (S) Paved (N)	Osceola/ Clarke
	EB	Right	No	No	No Recommendation		
	WB	Left	No	No	No Recommendation		
	WB	Right	No	Yes[a]	Minor Right		
Southwest Boulevard	EB	Right	Yes	Yes	Existing Turn Lane Adequate[c]	Suburban, Paved (S only)	Osceola/ Clarke
	WB	Left	Yes	Yes	Existing Turn Lane Adequate[f]		
I-35 Southbound Ramps	EB	Right	No	Yes	Minor Right	Suburban, Paved (S only)	Osceola/ Clarke
	WB	Left	Yes	Yes	Existing Turn Lane Adequate[f]		
I-35 Northbound Ramps	EB	Right	No	Yes	Minor Right	Suburban, Paved (S only)	Osceola/ Clarke
	WB	Left	Yes	Yes	Existing Turn Lane Adequate[f]		
Warren Avenue	EB	Left	Yes	Yes	Existing Turn Lane Adequate[j]	Urban, Paved (N/S)	Osceola/ Clarke
	EB	Right	No	Yes	Minor Right		
	WB	Left	Yes	Yes	Existing Turn Lane Adequate[j]		
	WB	Right	No	Yes	Minor Right		
South Ridge Road	EB	Left	TWLTL	--[g]	No Recommendation	Urban, Paved (N/S)	Osceola/ Clarke
	WB	Left	TWLTL	--[g]	No Recommendation		
South McPherson Street	EB	Left	TWLTL	--[g]	No Recommendation	Urban, Paved (N/S)	Osceola/ Clarke
	EB	Right	No	--[g]	Increase turning radii		
	NB	Right	No	--[g]	Increase turning radii		
	WB	Left	TWLTL	--[g]	No Recommendation		

Table 2. Turn Lane Analysis

Intersection Location on US 34	US 34 Direction of Travel	Left/ Right	Existing Turn Lane Present	Turn Lane Warrant	Recommendations	Crossroad Characteristics	City/ County
South Gustin Street to South Fillmore Street	EB	Left	TWLTL	--[g]	No Recommendation	Urban, Paved (N/S)	Osceola/ Clarke
	WB	Left	TWLTL	--[g]	No Recommendation		
US 69	EB	Left	TWLTL	--[g]	No Recommendation	Urban, Paved (N/S)	Osceola/ Clarke
	EB	Right	No	--[g]	Increase turning radii[k]		
	WB	Left	TWLTL	--[g]	No Recommendation		
	WB	Right	No	--[g]	Increase turning radii[k]		
South Park Street to Harkin Hills Drive	EB	Left	TWLTL	--[g]	No Recommendation	Urban, Paved (N/S)	Osceola/ Clarke
	WB	Left	TWLTL	--[g]	No Recommendation		
270th Avenue	EB	Left	No	No	No Recommendation	Rural, Gravel (S), Paved (N)	E. of Osceola/ Clarke
	EB	Right	No	No	No Recommendation		
	WB	Left	No	No	No Recommendation		
	WB	Right	No	Yes[a]	Minor Right		
Liberty Highway (County Road R59)	EB	Left	No	Yes	Left Turn	Rural, Paved (N)	E. of Osceola/ Clarke
	WB	Right	No	Yes[a]	Minor Right		
330th Avenue (County Road R69)	EB	Left	No	No	No Recommendation	Rural, Paved (S), Gravel (N)	N. of Woodburn/ Clarke
	EB	Right	Yes	Yes	Existing Turn Lane Adequate[c]		
	WB	Left	No	No	No Recommendation		
	WB	Right	No	No	No Recommendation		

Table 2. Turn Lane Analysis

Intersection Location on US 34	US 34 Direction of Travel	Left/ Right	Existing Turn Lane Present	Turn Lane Warrant	Recommendations	Crossroad Characteristics	City/ County
US 65 (West Leg)	SB	Left	Yes	Yes	Existing Turn Lane Adequate[i]	Rural, Paved (N)	Lucas/ Lucas
	SB	Right	Yes	Yes	Existing Turn Lane Adequate		
	EB	Left	Yes	Yes	Existing Turn Lane Adequate		
	WB	Right	Yes	Yes	Existing Turn Lane/Ramp Adequate[c]		
US 65 (East Leg)/ Division Street	EB	Left	Yes	Yes	Existing Turn Lane Adequate	Rural, Paved (N/S)	Lucas/ Lucas
	EB	Right	Yes	Yes	Existing Turn Lane Adequate		
	WB	Left	Yes	Yes	Existing Turn Lane Adequate[d]		
	WB	Right	No	Yes	Minor Right		
200th Avenue	EB	Left	No	Yes	Left Turn	Rural, Gravel (S), Paved (N)	W. of Chariton/ Lucas
	EB	Right	No	No	No Recommendation		
	WB	Left	No	Yes[b]	Left Turn		
	WB	Right	Yes	Yes	Existing Turn Lane Adequate		
Court Avenue	EB	Left	Yes	Yes	Existing Turn Lane Adequate	Urban, Paved (N)	W. of Chariton/ Lucas
	WB	Left	Yes	No	Existing Turn Lane Adequate[c]		
	WB	Right	Yes	Yes	Existing Turn Lane Adequate		
16th Street/ 220th Avenue	EB	Left	No	Yes	Left Turn	Rural, Paved (N), Gravel (S)	Chariton/ Lucas
	EB	Right	No	No	No Recommendation		
	WB	Left	No	Yes[b]	Left Turn		
	WB	Right	Yes	No	Existing Turn Lane Adequate		

Table 2. Turn Lane Analysis

Intersection Location on US 34	US 34 Direction of Travel	Left/ Right	Existing Turn Lane Present	Turn Lane Warrant	Recommendations	Crossroad Characteristics	City/ County
South 1st Street	EB	Left	Yes	Yes	Existing Turn Lane Adequate[d]	Rural, Paved (N/S)	Chariton/ Lucas
	EB	Right	Yes	No	Existing Turn Lane Adequate[c]		
	WB	Left	Yes	No	Existing Turn Lane Adequate[c]		
	WB	Right	Yes	Yes	Upgrade from Minor to Major Right[f]		
Albia Road	EB	Left	Yes	No	Existing Turn Lane Adequate	Rural, Paved (N)	E. of Chariton/ Lucas
	WB	Right	Yes	Yes	Upgrade from Minor to Major Right[f]		
290th Avenue/ Cedar Street (County Road S56)	EB	Left	Yes	No	Existing Turn Lane Adequate[c]	Rural, Gravel (N), Paved (S)	N. of Russell/ Lucas
	EB	Right	Yes	Yes	Existing Turn Lane Adequate		
	WB	Left	Yes	Yes	Existing Turn Lane Adequate		
	WB	Right	No	No	No Recommendation		
515th Avenue	EB	Left	No	No	No Recommendation	Rural, Paved (N)	N. of Melrose/ Monroe
	WB	Right	Yes	Yes	Existing Turn Lane Adequate[c]		
520th Avenue (County Road S70)	EB	Right	Yes	Yes	Existing Turn Lane Adequate[c]	Rural, Paved (S)	N. of Melrose/ Monroe
	WB	Left	Yes	Yes	Existing Turn Lane Adequate		
197th Trail (County Road H35)	WB	Right	No	Yes[a]	Minor Right	Rural, Paved (N)	W. of Albia/ Monroe
204th Trail (E)	EB	Right	No	Yes[a]	Minor Right	Rural, Paved (S)	W. of Albia/ Monroe
196th Street/ 623rd Avenue (County Road T7H)	WB	Right	No	Yes[a]	Minor Right	Rural, Paved (N), Gravel (S)	W. of Albia/ Monroe

Table 2. Turn Lane Analysis

Intersection Location on US 34	US 34 Direction of Travel	Left/ Right	Existing Turn Lane Present	Turn Lane Warrant	Recommendations	Crossroad Characteristics	City/ County
Clinton Street/ IA 5	EB	Left	No	Yes	Left Turn	Urban, Paved (N/S)	Albia/ Monroe
	EB	Right	No	Yes[a]	Minor Right		
	WB	Left	No	Yes	Left Turn		
	WB	Right	No	Yes[a]	Minor Right		
13th Street/ 201st Street (County Road H47)	EB	Left	No	Yes	Left Turn	Rural, Paved (N/S)	Albia/ Monroe
	EB	Right	No	Yes	Minor Right		
	WB	Left	No	Yes[b]	Left Turn		
	WB	Right	No	Yes	Minor Right		

[a] Minor right turn at paved sideroad

[b] Left-turn symmetry

[c] Lengthen turn lane taper (see Table 3)

[d] Increase storage length

[e] Passing lane recommended at this location

[f] Convert to offset turn lane

[g] Turn lane warrant not analyzed

[h] No historical safety or site-specific factors necessitate a turn lane

[i] Consider modifying intersection design to bring SB left turn onto US 34 EB as an add lane due to high turn volumes

[j] Recommended offset left-turn lane from *City of Osceola Traffic and Safety TEAP Study* (HR Green, 2019)

[k] Recommended increasing turning radii in all quadrants from *US 69 - Pearl Street to BNSF RR Crossing Corridor Study* (Snyder & Associates, 2020)

Notes:

EB = eastbound

NB = northbound

SB = southbound

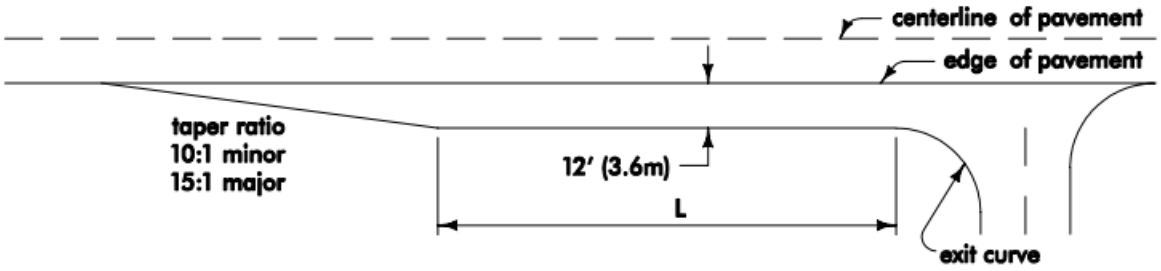
WB = westbound

TWLTL = two-way left-turn lane

Table 3. Turn Lane Tapers

Intersection Location on US 34	US 34 Direction of Travel	Left/ Right	Existing Taper	Desired Taper	City/County
130th Avenue (County Road R15)	EB	Right	10:1	15:1	Murray/Clarke
Southwest Boulevard	EB	Right	9:1	15:1	Osceola/Clarke
330th Avenue (County Road R69)	EB	Right	9:1	15:1	N. of Woodburn/ Clarke
US 65 (West Leg)	WB	Right	13:1	15:1	Lucas/Lucas
Court Avenue	WB	Left	6:1	10:1	W. of Chariton/ Lucas
South 1st Street	EB WB	Right Left	14:1 9:1	15:1 10:1	Chariton/ Lucas
290th Avenue/ Cedar Street (County Road S56)	EB	Left	6:1	10:1	N. of Russell/ Lucas
515th Avenue	WB	Right	11:1	15:1	N. of Melrose/ Monroe
520th Avenue (County Road S70)	EB	Right	11:1	15:1	N. of Melrose/ Monroe

Figure 3. Desired Taper Ratio



5.2 SUPER TWO PROPOSED PASSING LANE LOCATIONS

A range of passing lane configurations and combinations in each direction of travel were developed and evaluated. The evaluation of the passing lane locations was generally limited to the rural sections of the Study corridor. Posted speeds are reduced through the communities of Osceola, Lucas, and Albia and, therefore, do not fit the need for Super Two passing lanes. Existing climbing lanes are present throughout the Study corridor and were factored into the proposed configurations and spacings. Current Super Two design guidance and practice from the *Iowa DOT Design Manual* (Iowa DOT, 2023) recommends a preferred spacing of 4 to 5 miles between passing lanes with allowable adjustments up to 0.5 mile. The uniform spacing builds a sense of expectation for a driver as to when future passing opportunities will be available.

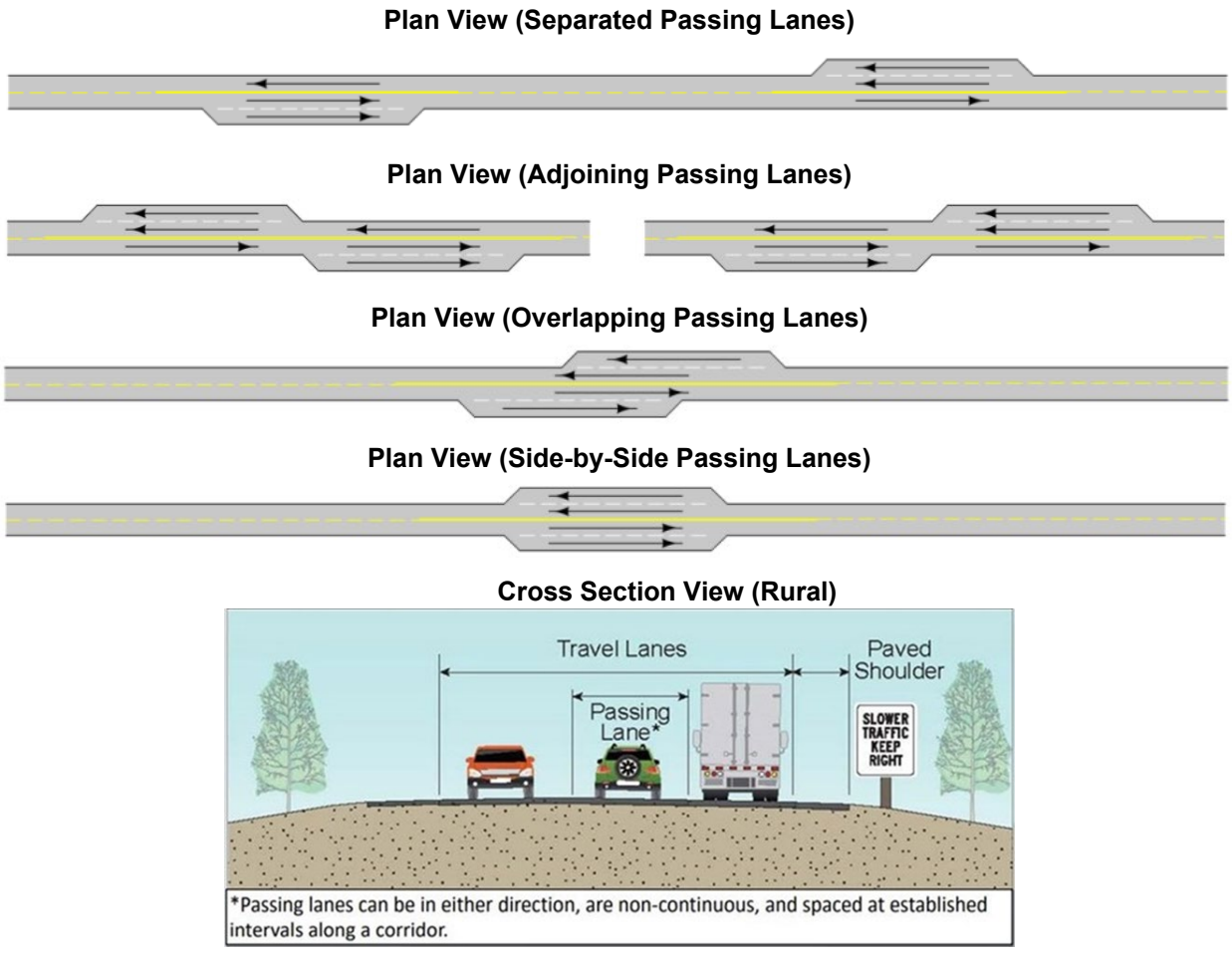
Passing lane lengths were determined using the *Iowa DOT Design Manual* guidance in Chapter 6C-2 (Iowa DOT, 2023). Existing traffic volumes were forecasted by Iowa DOT using 2018 AADT data. These data were reviewed in the rural sections to determine passing lane lengths. A posted speed of 55 mph was used to determine the length of the merge taper with a standard 15:1 diverge taper.

The following resources were used to evaluate the placement of proposed passing lane locations:

- Existing infrastructure, including large drainage structures, highway curvature and vertical grades, bridges, access density, major utilities, and railroads
- *Iowa DOT Design Manual* policies in Chapters 6C-1 and 6C-2 (Iowa DOT, 2023)
- Desktop review of environmental resources

Figure 4 represents the typical passing lane concepts. Where possible, a separated passing lane plan layout is the preferred pattern recommended by the Iowa DOT for passing lane locations. Other layout patterns include adjoining, overlapping, or side-by-side configurations. Designing separated or adjoining passing lanes helps prevent the illusion of a four-lane expressway as depicted in the side-by-side or overlapping layouts. A four-lane cross section may give drivers the expectation that they can drive faster than normally allowed for a rural two-lane highway. Additional guidance is provided in the *Iowa DOT Design Manual*, Chapter 6C-2 (Iowa DOT, 2023), for passing lane lengths based on traffic volumes.

Figure 4. Passing Lane Concepts



Source: Iowa DOT.

The various configurations and combinations were ultimately combined into one proposed alternative shown in Appendix F. In the westbound direction, the Study is recommending seven new passing lanes, four extensions to existing climbing lanes, and two existing climbing lanes to remain as-is. In the eastbound direction, the recommendations are seven new passing lanes, two extensions to existing climbing lanes, and two existing climbing lanes to remain as-is. They are referred to hereafter as WB # or EB # throughout the document. Extensions of existing climbing lanes are generally intended to bring the length of passing distance more in line with Super Two guidelines outlined in Chapter 6C-2 (Iowa DOT, 2023). However, extending a climbing lane just to meet a specified length in the Super Two guidelines may not be feasible from a practical design approach depending on the location of the climbing lane and the existing terrain, infrastructure, and geometry of the highway. These factors were reviewed at each climbing lane and helped shape the recommendations discussed in more detail in this section.

Large structures, such as bridges and multiple barrel concrete box culverts, were avoided along with several steep embankments between MP 159 and MP 165 that are reinforced with riprap. Impacts to these structures and embankments would be costly for roadway expansion. Intersections where both approaches are paved were also avoided. Smaller box culverts and

roadway culverts may be affected and need to be extended in several areas where passing lanes are recommended.

Passing lanes were maximized, to the extent feasible between the project boundaries and communities located along the corridor. The areas from the western project limits to Osceola, from Osceola to Lucas, from Lucas to Chariton, from Chariton to Albia, and from Albia to the eastern project limits were all targeted for passing lane analysis. There are a handful of vertical grades throughout the Study that could see a reduction in truck travel speed between 5 and 10 mph. Passing lanes help decrease the negative impacts of the steeper vertical grades/slopes where possible.

5.2.1 WESTERN PROJECT LIMITS TO OSCEOLA

One new westbound passing lane is recommended, as well as two extensions to existing westbound climbing lanes and two extensions to existing eastbound climbing lanes. The proposed spacing between passing lanes in this section of the highway is a little shorter than the ideal recommended Super Two spacing but is dictated by the existing climbing lanes present today.

WB #1 is an extension of an existing westbound climbing lane that currently terminates near the Clarke-Union Avenue intersection. The termination of the climbing lane near the intersection creates conflicting vehicle movement patterns in which some vehicles are slowing to turn right at the intersection, while others will be merging left into the main highway through lane. The proposed recommendation is to extend the passing lane to the intersection to keep right-turning vehicles out of the through lane and then terminate the passing lane west of the intersection.

EB #1 is an extension of an existing climbing lane in both the east and west directions. Through conversations with the Amish community, it was noted that the beginning of this climbing lane is near the intersection with 110th Avenue and needs to be better demarcated. Adjusting the beginning of the passing lane approximately 500 to 1,000 feet to the west will push that diverge taper away from the intersection, and the pavement markings will then clearly delineate the two lanes before reaching 110th Avenue. Extending the climbing lane east to the recommended Super Two passing lane length benefits traffic flow as this length of highway is entirely on an uphill grade. Recommended extensions are 0.2 mile to the west and 0.5 mile to the east.

WB #2 is an existing climbing lane that is recommended to be extended 0.5 mile to the east. The current diverge taper for the climbing lane begins just east of 135th Avenue/County Road R16 and functions as a minor right-turn lane taper to this side road. The turn lane analysis recommended upgrading this minor right- to a major right-turn lane. The merge taper for the climbing lane begins west of the 130th Avenue/County Road R15 intersection. Extending this climbing lane east to the Super Two passing lane length will address the added storage length recommended for the right-turn lane to 135th Avenue/County Road R16, as well as better delineate the pavement markings by moving the diverge taper away from the intersection. This extension is mostly on an uphill grade, which will also benefit traffic flow.

EB #2 is the extension of an existing climbing lane to the east that currently ends near the 160th Avenue intersection. The 0.4-mile extension will carry the passing lane through this intersection and provide additional length for eastbound traffic to pass.

WB #3 is a new proposed passing lane in the westbound direction and is located 5.1 miles from passing lane WB #2. This passing lane is in a straight tangent section of the highway with relatively flat vertical grades.

5.2.2 OSCEOLA TO LUCAS

The Study recommends two new eastbound passing lanes and one new westbound passing lane between Osceola and Lucas. There are also four existing westbound climbing lanes and one existing eastbound climbing lane, all concentrated between MP 127 and MP 131. The existing climbing lanes are appropriately located due to the hilly terrain in this area. Because three of the existing climbing lanes are in short succession, it is recommended to connect the three to make one continuous passing lane (WB #6). This will provide uniform passing opportunities so that slower vehicles are not continually merging into faster traffic. Connecting these three into one continuous passing lane also better aligns the overall passing length with the data outlined in the Super Two criteria.

The locations for the two proposed eastbound passing lanes, EB #3 and EB #4, were chosen because they overlap long uphill grades for almost the entirety of their length. Proposed westbound passing lane WB #4 is designed in an adjoining configuration with EB #4 and overlaps two shorter uphill grades. The addition of passing lanes WB #4 and EB #4 should not affect the reinforced concrete box culvert located at MP 122.4.

There are no recommendations for existing climbing lanes WB #5 and EB #5. EB #5 parallels an existing westbound climbing lane and creates the appearance of a four-lane highway, which is not ideal for a rural two-lane highway. Extending EB #5 to the east would only expand the appearance of a four-lane highway. Extending EB #5 to the west would take place through a large sag curve and begin on a long downgrade, which is unconventional. Similarly, WB #5, if extended, would only occur through sag curves adjacent to the climbing lane. Given that WB #6 is only 1 mile away, there is ample opportunity for a passing window in this section of highway.

5.2.3 LUCAS TO CHARITON

The distance from Lucas to Chariton is approximately 7 miles, which is relatively short when considering a layout for Super Two passing lanes. The distance is made even shorter when factoring in existing bridges and floodplain, which are present east of Lucas. Existing floodplain overlaps the highway between MP 131 and MP 135, and two bridges are located between MP 134 and MP 135. There is an existing climbing lane (EB #6) near MP 135 that extends along a steep uphill grade and was recently extended on a resurfacing project completed by the Iowa DOT. There are no recommendations for EB #6 because this climbing lane already meets the passing lane length criteria for Super Two and no other issues were noted at his location.

Given the limited distance, there is enough space to fit one additional passing lane in the westbound direction. WB #7 was designed to begin near the Court Avenue intersection just west of Chariton. Through the field review and stakeholder correspondence, it was noted that the westbound Court Avenue merge onto US 34 is very abrupt and could benefit from the addition of a properly designed acceleration lane. The recommendation of this Study is that the merge lane from Court Avenue be offset as an add lane parallel to US 34, which then begins the

proposed passing lane WB #7. This added lane will provide adequate distance for traffic to accelerate on the uphill grade heading west out of Chariton.

5.2.4 CHARITON TO ALBIA

The primary goal in this segment of the Study was to maximize the number of passing lanes to the greatest extent feasible while adhering to the Super Two criteria. The recommendations are four new westbound passing lanes, five new eastbound passing lanes, and maintaining one existing westbound climbing lane as-is. The spacing of the passing lanes in this segment is relatively uniform and designed in a separated configuration. This segment contains relatively flat grades between MP 146 and MP 161 when compared with other parts of the Study corridor. Outside of this range, the terrain is hillier, and the passing lane layout attempts to take advantage of some of those locations. EB #7, EB #11, and WB #12 all overlap areas with long uphill grades.

5.2.5 ALBIA TO THE EASTERN PROJECT LIMITS

East of Albia, there is only one existing climbing lane within this section. WB #13 is recommended as an extension of the existing climbing lane that currently terminates near the 13th Street intersection. The termination of the climbing lane near the intersection creates conflicting vehicle movement patterns, in which some vehicles are slowing to turn right at the intersection while others will be merging left into the main highway through lane. The proposed recommendation is to extend the passing lane to the intersection to keep right-turning vehicles out of the through lane and then terminate the passing lane west of the intersection. Extending the climbing lane to meet the Super Two passing lane length is not necessary at this location because the extension would be on a long downgrade and is less than 0.5 mile from a posted speed reduction heading into Albia. Table 4 provides the recommended passing lane locations.

Table 4. Recommended Passing Lane Locations

Passing Lane #	Begin Mile Post	End Mile Post	Direction	Begin Elevation (feet)	End Elevation (feet)	Passing Lane Length (feet)	Total Length (including tapers) (feet)	Distance to Next Direction Passing Opportunity (West to East) (miles)	City/County
WB #1	102.8	103.3	West	1099	1148	2,460	3,300	2.6	W. of Murray/ Clarke
EB #1	103.6	104.8	East	1086	1181	5,280	6,120	3.8	W. of Murray/ Clarke
WB #2	106.0	106.9	West	1138	1218	4,300	5,140	5.1	Murray/Clarke
EB #2	108.6	109.6	East	1135	1155	4,300	5,140	4.5	W. of Osceola/ Clarke
WB #3	112.2	113.1	West	1148	1136	4,300	5,140	1.0	W. of Osceola/ Clarke

Table 4. Recommended Passing Lane Locations

Passing Lane #	Begin Mile Post	End Mile Post	Direction	Begin Elevation (feet)	End Elevation (feet)	Passing Lane Length (feet)	Total Length (including tapers) (feet)	Distance to Next Direction Passing Opportunity (West to East) (miles)	City/County
Four-lane passing section in Osceola									
EB #3	117.6	118.8	East	1056	1132	5,280	6,120	3.7	E. of Osceola/ Clarke
WB #4	121.4	122.4	West	1035	1109	4,300	5,140	4.9	E. of Osceola/ Clarke
EB #4	122.5	123.4	East	1030	1083	4,300	5,140	5.3	E. of Osceola/ Clarke
WB #5	127.3	127.8	West	1027	1070	1,940[a]	2,780[a]	1.0	W. of Lucas/ Clarke & Lucas
EB #5	128.8	129.3	East	981	1010	2,210[a]	3,050[a]	5.4	W. of Lucas/ Lucas
WB #6	128.8	130.8	West	927	1008	10,560	11,400	7.6	W. of Lucas/ Lucas
EB #6	134.8	135.6	East	879	1022	3,330[a]	4,170[a]	4.9	E. of Lucas/ Lucas
WB #7	138.8	139.8	West	1024	1007	4,300	5,140	1.1	W. of Chariton/ Lucas
Four-lane passing section in Chariton									
EB #7	145.2	146.2	East	956	1020	4,300	5,140	4.4	E. of Chariton/ Lucas
WB #8	144.2	144.8	West	955	1007	2,180[a]	3,020[a]	3.5	E. of Chariton/ Lucas
EB #8	150.6	151.4	East	971	991	3,200	4,040	4.0	E. of Chariton/ Lucas
WB #9	148.3	149.0	West	1025	1027	3,200	4,040	3.6	E. of Chariton/ Lucas
EB #9	155.5	156.2	East	961	994	3,200	4,040	3.9	N. of Melrose/ Monroe

Table 4. Recommended Passing Lane Locations

Passing Lane #	Begin Mile Post	End Mile Post	Direction	Begin Elevation (feet)	End Elevation (feet)	Passing Lane Length (feet)	Total Length (including tapers) (feet)	Distance to Next Direction Passing Opportunity (West to East) (miles)	City/County
WB #10	152.6	153.4	West	1004	1001	3,200	4,040	3.5	N. of Melrose/ Monroe
EB #10	160.3	161.1	East	978	981	3,200	4,040	5.0	W. of Albia/ Monroe
WB #11	156.9	157.6	West	987	971	3,200	4,040	3.9	W. of Albia/ Monroe
EB #11	166.2	167.0	East	823	935	3,200	4,040	0.8	W. of Albia/ Monroe
WB #12	161.6	162.6	West	898	952	4,300	5,140	5.0	W. of Albia/ Monroe
Four-lane passing section in Albia									
WB #13	168.7	169.3	West	912	928	2,080	2,920	-	E. of Albia/ Monroe

[a] Existing climbing lane to remain as-is

5.3 SPOT ROADWAY IMPROVEMENTS

The Study identified and analyzed some potential spot roadway improvements within the Study area. The following criteria were used to evaluate a series of spot improvements:

- Existing roadway conditions
- Input from stakeholders and Iowa DOT officials
- Crash and PCR data from 2017 through 2021
- Existing infrastructure, such as the presence of bridges and reinforced concrete box culverts
- Environmental constraints

There are several additional recommendations based upon review of the existing conditions or the Super Two criteria that are considered under spot improvements, including:

- Upgrading existing narrow or partially paved shoulders to full-width paved shoulders, and regrading ditches as needed due to shoulder widening
- Addressing resiliency issues in areas with standing water or drifting snow
- Addressing potential visual trap along US 34 eastbound approaching Court Avenue
- Improving signage
- Roadside improvements

Recommended improvements are included in both the rural and urban settings across the Study corridor. Appendix E shows the locations of all recommended improvements.

5.3.1 SHOULDER WIDENING

Shoulder widths through the Study area range from 8 to 10 feet and are composed of a combination of paved and granular material. The Iowa DOT standard for Super Two corridors recommends that existing shoulders less than 8 feet be widened to 10 feet and paved full width (Iowa DOT, 2023). Because there are no locations with paved 8-foot shoulders and less than a handful of intersections with fully paved 10-foot shoulders, most of the US 34 corridor is recommended to have shoulder widening and paving to 10 feet. The fully paved shoulder will benefit the horse-drawn buggies, which do not perform well on the partially paved shoulders. Providing a fully paved shoulder allows for safer off mainline pavement travel for horse-drawn buggies.

The recommended shoulder widening does not cover bridges or large concrete box culverts, as depicted on the Study corridor maps in Appendix E unless they are scheduled for replacement. Future shoulder widening projects will need to determine whether shoulder widening at these structures is necessary and cost effective. It might be more practical to increase bridge shoulder widths or lengthen box culverts based on the life cycles of the structures themselves, rather than as part of a shoulder widening project. Highway ditch capacity and ditch grading will need to be reviewed in greater detail with any proposed shoulder widening. ROW will also need to be reviewed as ditch grading will widen away from the highway with any increase in shoulder width and require extra ROW.

5.3.2 DRAINAGE AND RESILIENCY IMPROVEMENTS

In locations where roadway and shoulder widening is recommended, future studies should consider whether ditches need to be reconstructed and whether additional storage for roadway water runoff is adequate based on the increase in paved area.

In addition, it is noted on the corridor exhibits that consideration should be given to correcting issues associated with standing water along US 34 that occurs within floodplain areas and near waterbodies. Improvements could range from highway profile modifications to additional detention areas to modifications to drainage ditches. The locations along the corridor identified for these types of improvements include the following:

- Through Lucas between MP 131 and MP 135
- The west side of Chariton between Court Avenue and IA 14 (Main Street) between MP 140 and MP 141.5
- Near Red Haw Lake and Lake Ellis between MP 143 and MP 144
- Near Lake Morris and East Lakes between MP 144 and MP 145.5
- Near Cedar Creek, west of Albia between MP 165 and MP 167

5.3.3 FENCING OR SNOW BORROW

Through the stakeholder engagement process and input from the District, it was noted that there are a few locations in the Study corridor with issues from snow drifting due to the low profile of US 34 relative to the adjacent agricultural fields. The snow drifts tend to occur along

the flat areas of US 34 between MP 138 and MP 139 and between MP 145 and MP 155. It is recommended that snow borrow or fences be considered within these segments.

One option would be to implement snow borrow projects along the corridor to create areas parallel to the highway to hold back snow. This may involve purchasing new ROW. Another option would be to construct temporary snow fencing that could be installed after harvest and removed before planting in the spring, as outlined in *Iowa's Cooperative Snow Fence Program* (Iowa DOT, 2005). Other options are more permanent in nature and may not be well suited or compatible with the annual agricultural harvesting that takes place, such as a permanent structural snow fence, or a living snow fence of trees, shrubs, and native grasses. These more permanent options would also likely require new ROW to be purchased.

5.3.4 VISUAL TRAP

There is one visual trap within the Study corridor, around Court Avenue on the west side of Chariton near MP 139.8). The recommended improvements to mitigate this issue are to modify the Court Avenue westbound ramp entering onto US 34 westbound, install delineators and chevron signs that will help drivers' eyes to follow the highway curve, and provide additional wrong way signs along the westbound entrance ramp.

5.3.5 IMPROVED SIGNAGE

Signage can support positive driver behavior and inform motorists of potentially congested areas or hazards ahead. New or improved signage is recommended at the following areas:

- Between Clarke-Union Avenue (west end of Study) through Lucas (MP 102.5 to MP 133) to alert motorists of potential horse-drawn buggies along the route
- Near the Russell Livestock Market (MP 150), consideration to add vehicular traffic warning signs to alert motorists that traffic frequently slows down to enter the business; signage alerting motorists that there are trucks crossing the opposing lanes to enter the business
- US 34 eastbound approach to Court Avenue and through the horizontal curve (MP 139.5 to MP 140.1)

5.3.6 ROADSIDE IMPROVEMENTS

Along the US 34 corridor, several roadside improvements were identified and noted on the corridor exhibits in Appendix E. Types of improvements include evaluating intersection sight distance and adding or modifying guardrail. Additional details regarding these improvements are included on the concept drawings.

5.4 NEXT STEPS

Findings, observations, and recommendations developed as part of this Study will serve as the foundation for future projects on this corridor. This Study will not result directly in a programmed "funded" project; however, in some components, that can be addressed over time and incorporated into future smaller-scale projects as they are to be constructed, like pavement condition-driven projects. These recommendations may be modified as they are incorporated into future projects based on changing conditions and new information.

6 REFERENCES

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APPENDIX A – SMALL GROUP MEETING SUMMARIES

Small Group Stakeholder Meeting – Monroe County; US 34 Super Two Corridor Study

PREPARED FOR:	Iowa DOT
PREPARED BY:	Jacobs
DATE:	August 24, 2023

ATTENDEES:

Scott Kelly, City of Albia Council
Joe Hughes, Monroe County Supervisor
Mike Beary, Monroe County Supervisor
Dan Johnson, Monroe County Sheriff
Dan Tometich, Albia Industrial Development Corporation
Denny Amoss, Vice-Chairman, Monroe County Board of Supervisors
Brandon Williams, City of Albia Council
Merle Regenold, Albia City Council
Jeremiah Selby, Monroe County Engineer
Julie Pribyl, CVPD – COG
Nichol Moore, CVPD – COG – RPA 17
Beth Waddle, Southern Iowa Council of Governments (via Teams meeting)
Hector Torres-Cacho, Iowa DOT, D-5
Gary Harris, Iowa DOT
Madeline Schmitt, Iowa DOT
Steve McElmeel, Iowa DOT
Trevor Wolf, Iowa DOT
Bob Younie, Iowa DOT (via Teams meeting)
Pedro Leanos, Iowa DOT (via Teams meeting)
Ryan Brown, Jacobs Engineering
Carla Mykytiuk, Jacobs Engineering
Kerry Meyer, Jacobs Engineering (via Teams meeting)
Christine Norrick, Jacobs Engineering (via Teams meeting)

On the afternoon of August 16, 2022, 18 attendees met at the Albia City Hall with 5 joining via Teams meeting to discuss the US 34 Super Two Corridor Study. The general outline of the guided discussion included:

1. Project Locations and Study Area
2. Purpose of US 34 Study and this Small Group Meeting
3. Introductions
4. Improvements Alternatives under Consideration
5. Study Schedule
6. Stakeholder and Public Involvement Opportunities
7. US 34 input from Albia and Monroe County's perspective
    a. Existing Roadway
    b. Future Roadway
    c. Stakeholders
    d. Key Considerations
8. Next Steps

Ryan Brown, Jacobs Lead Engineer, opened the meeting with an introduction of the US 34 Super Two Corridor Study. The Study is looking at a 65-mile-long section of US 34 in south central and southeastern Iowa, beginning at the western limits of Clarke County and extending east through Lucas and Monroe counties to its junction with IA 5 near Albia. The Study will examine whether the existing facility is able to meet current and future travel and

mobility needs and identify any potential improvement projects that may be necessary to meet future demands. The Study is expected to take approximately 12 months to complete with a target date of May 2023.

The purpose of the meeting in Monroe County was to gather input from Monroe County and City of Albia representatives on the Study and to discuss planned public outreach efforts.

Monroe County Feedback and Concerns

Questions

Q. Will Iowa DOT extend US 34 out, like Highway 5 with wider shoulders to accommodate wide trucks?

Q. If project goes forward, how long will it be until they move forward, 5-10 years?

> A. Projects will be programmed as needs are identified but can happen sooner than anticipated. Key is to be ready.

Q. Regarding the future with electric cars, where will revenue come from when everyone is driving electric cars? Will we see charging infrastructure in roadway?

Q. Is connectivity, including pedestrian and bicycle accommodations being considered?

Q. Are pullouts or other accommodations for cell phone use being considered?

Context Audit

- Monroe County has 3 paved roads that join US 34
- There is extensive truck traffic accessing and using US 34
  - Many trucks coming from the south
  - Iowa Bioprocessing Center in Eddyville
  - Cargill – has about 625 trucks
  - Quality Ag Services and other farm coops are traffic/truck generators. They often use Highway 5 and connect with US 34.
- US 34 is busy for a 2-lane road

<u>Locations with issues or concerns</u>

- The 4-way stop is a concern at the US 34/IA 5 intersection. A lot of heavy equipment moves through, particularly from Cargill. There are accidents. Some thought a roundabout won't work.
- General concern with times to exit various facilities onto IA 5 that travel to US 34; such as State Bank and True Value Hardware. Several businesses end of workday traffic funnels onto IA 5 and congests the intersection with US 34 - RELCO, AYM, Iowa Aluminum,

Hawkeye Molding. Long waits for traffic out of the hardware store (can take 15-20 minutes to get out).

- Concerns east of Albia on US 34 were mentioned. Several car accidents occur between Albia and Ottumwa.

- Some decent turning traffic WB to EB at 196th St (County Road T7H) - potential for a left turn lane.

- Poor sight distance at 625th Avenue – review for a potential location of a turn lane.

- The 4-way stop at the US 34/IA 5 intersection - after being restriped 4 lanes to 3 lanes is not operating effectively.

  – Iowa DOT is looking at ways to correct this such as restriping. Roundabouts were discussed at this location.

  – A stoplight was an option, but Albia declined because they could not maintain it.

- In the Chariton area, eastbound, vertical and horizontal left turn. Bridge may affect turning and passing lanes. There's a similar area a little bit west.

- Wider shoulders for farm equipment (like in Centerville).

<u>Other Discussion Topics</u>

- It would be better to put in actual electric vehicle charging stations that cause people to stop in our Iowa towns and spend a little money.

- Speed management is a concern. "55 is hard" Suggested the speed limit be raised to 60 mph. Iowa DOT suggested that the Iowa legislature be contacted about speed limits.

<u>Planned Development that may impact traffic on US 34</u>

- Potential development mentioned included an industrial park in southern Albia (or south of Albia) that would introduce more trucks and trains.

<u>Community Priorities</u>

- Improvements to US 34 should focus on safety, including creeper and turning lanes, and improvements to aid school buses (passing on hills)

- The Southern Iowa Council of Governments said that the plan for a Super 2 seems very non-future thinking. Businesses and Industries look for 4-lane transportation in order to put new industries or expansions into communities. It is even getting more and more important to bring new residents into communities. They are looking for safe, smaller communities, but want a 4-lane to get out to social opportunities. This also affects economic development and population growth in the counties in the southern tier of the state. Should look at future economic development growth and population growth. We need both in southern Iowa and will be slow to happen if at all without a 4-lane. The northern half of the state has several 4-lane options. The southern half is forgotten.

Public Involvement

- Suggested stakeholders that should be included include farmers, railroads, and businesses.
- Suggestions for any in person meetings include the Albia City Hall, Chariton High School, and the Honey Creek Resort.
- Monroe County and Albia residents get their news and information from the *Albia Republican* newspaper and Albia's and Monroe County's websites and listen to radio station KIIC, 96.7.
- In addition, the Albia Happenings and the Chamber of Commerce's Main Street Facebook pages are used to share information with the community.
- Hwy 34 is a major thoroughfare for all the counties on either side from the north and south. You should include all those counties, cities, EDs, chambers, etc. in the invitation for public comment.

Action Items

- None.

Small Group Stakeholder Meeting – Lucas County; US 34 Super Two Corridor Study

PREPARED FOR: Iowa DOT

PREPARED BY: Jacobs

DATE: August 24, 2023

ATTENDEES:

Laura Liegois, City of Chariton
Jeff Johnson, Chariton Police Department
Christopher Watkins, Lucas County Economic Development
Todde W. Folkerts, PE/PLS, Lucas County Engineer
Julie Pribyl, CVPD – COG
Alicia McGee, Chariton Chamber (via Teams)
Hector Torres-Cacho, Iowa DOT, D-5
Gary Harris, Iowa DOT
Madeline Schmitt, Iowa DOT (via Teams)
Steve McElmeel, Iowa DOT
Trevor Wolf, Iowa DOT
Pedro Leanos, Iowa DOT (via Teams)
Ryan Brown, Jacobs Engineering
Carla Mykytiuk, Jacobs Engineering
Kerry Meyer, Jacobs Engineering (via Teams)
Mike LaPietra, FHWA

On the afternoon of August 17, 2022, 12 attendees met at the Chariton City Hall with four others participating via Teams meeting to discuss the US 34 Super Two Corridor Study. The general outline of the guided discussion included:

1. Project Location and Study Area
2. Purpose of US 34 Study and this Small Group Meeting
3. Introductions
4. Improvements Alternatives under Consideration
5. Study Schedule
6. Stakeholder and Public Involvement Opportunities
7. US 34 input from Chariton and Lucas County's perspective
    a. Existing Roadway
    b. Future Roadway
    c. Stakeholders
    d. Key Considerations
8. Next Steps

Ryan Brown, Jacobs Lead Engineer, opened the meeting with an introduction of the US 34 Super Two Corridor Study. The Study is looking at a 65-mile-long section of US 34 in south central Iowa, beginning at the western limits of Clarke County and extending east through Lucas and Monroe counties to its junction with IA 5 near Albia. The Study will examine whether the existing facility is able to meet current and future travel and mobility needs and identify any potential improvement projects that may be necessary to meet future demands. The Study is expected to take approximately 12 months to complete with a target date of May 2023.

The purpose of the meeting in Lucas County was to gather input from Lucas County and City of Chariton representatives on the Study and to discuss planned public outreach efforts.

Lucas County Feedback and Concerns

Questions

- No questions were asked at this meeting.

Context Audit

Generally, the consensus was that there are few issues with US 34 in the county and that Old 34 works well.

Locations with issues or concerns

- There are visibility issues at the 4th street intersection as the guardrail connected to the railroad bridge limits line of sight and when the sun is setting it can cause blinding light when looking west.

- Lots of turning trucks at 200th Avenue (county road S23) going up to HyVee. There is an existing WB right turn lane, but no EB left turn lane to get trucks out of the through lane.

- Russell Livestock Market could use turning lanes – potential for either an EB left or WB right.

- Livestock Market generates significant traffic on Sunday and Monday

- Chariton Municipal Airport is a traffic generator and could benefit from a turn lane.

Planned Development that may impact traffic on US 34

- Increased heavy truck traffic using US 34 is anticipated from agricultural producers, Hy-Vee (which has heavy truck traffic [205 trucks in and out daily]), Russell Livestock (over 100 trucks per week), East Penn Trucks, Johnson Machine Works, a wind turbine manufacturer, and a Seats, Inc. expansion.

- The increase in tourism, especially day trips within 2-3 hours of major cities, and the rise in people wanting to relocate to smaller communities - we could see increased traffic and use of infrastructure.

Community Priorities

- US 34 improvements should focus on connections, including bike lanes to Red Haw State Park and near to Rathbun Lake Bike Trails. Lake Ellis and Lake Morris were mentioned as potential for future development of trail connections to Chariton. It was noted that Lucas County/Chariton does not have a long-term transportation plan. Region 17 does have a plan, but it is waiting for money. Cinder Path goes underneath US 34 – and is Iowa's first rail-to-trail conversion. Since Cinder Path crosses US 34 there is potential to connect a trail out to Red Haw or the city lakes via US 34.

- Elevator traffic on ROW would benefit from paved shoulders. Maybe 5% is tractor/wagon.

- Chariton airport access – specifically turning lanes in and out onto US 34. The airport has two runways that can land jets – the airport is expanding its fuel/tank capacity.

- Safety and mobility improvements including accommodation of wide and oversized vehicles and long-term planning for industrial and agricultural development.

Public Involvement

- Others that should be added to the stakeholder list include businesses such as HyVee, Johnson Machine Works, and Seats, Inc. as well as the Livestock Market and United Farmers Coop.

- If in person meetings were to be held, the Johnson Auditorium at the Chariton Community Center was recommended.

- Chamber/Main Street is encouraged as a source for information for the community.

- Residents primarily get their information from social media, such as the Facebook Group "Lucas Co-In the Know", and GoNewPaper.com (similar to NextDoor), a website that shares calendar information from the cities and counties official calendars.

- Some subscribe to the Chariton Leader newspaper.

- Radio stations 96.7 KIIC, 98.7, and 100.3 are other sources of news and information.

Action Items

- None.

Small Group Stakeholder Meeting – Clark County; US 34 Super Two Corridor Study

PREPARED FOR: Iowa DOT

PREPARED BY: Jacobs

DATE: August 24, 2023

ATTENDEES:

Ty Wheeler, City of Osceola
Denise Arnold, City of Murray
Christian Brehmer, Clarke County Engineer
Officer Marty Duffus, Osceola Police Department
Byron Jimmerson, Clarke County Emergency Management
Mike Fry, Osceola Street Commission
Nichole Moore, Chariton Valley Planning & Development Council – COG – RPA 17
Jessica Hagen, SICOG (via Teams)
Senator Amy Sinclair, Iowa State Senate, District 14 (via Teams meeting)
Julie Pribyl, CVPD – COG (via Teams)
Hector Torres-Cacho, Iowa DOT, D-5
Gary Harris, Iowa DOT
Madeline Schmitt, Iowa DOT
Steve McElmeel, Iowa DOT
Trevor Wolf, Iowa DOT
Pedro Leanos, Iowa DOT
Mike LaPietra, FHWA (via Teams meeting)
Ryan Brown, Jacobs Engineering
Carla Mykytiuk, Jacobs Engineering
Kerry Meyer, Jacobs Engineering (via Teams)
Christine Norrick, Jacobs Engineering (via Teams)

On the afternoon of August 17, 2022, 16 attendees met at the Osceola City Hall with 6 others participating remotely via Teams to discuss the US 34 Super Two Corridor Study. The general outline of the guided discussion included:

9. Project Location and Study Area
10. Purpose of US 34 Study and this Small Group Meeting
11. Introductions
12. Improvements Alternatives under Consideration
13. Study Schedule
14. Stakeholder and Public Involvement Opportunities
15. US 34 input from Osceola and Clark County's perspective
    a. Existing Roadway
    b. Future Roadway
    c. Stakeholders
    d. Key Considerations
16. Next Steps

Ryan Brown, Jacobs Lead Engineer, opened the meeting with an introduction of the US 34 Super Two Corridor Study. Led by the Iowa Department of Transportation (DOT), the Study looks at a 65-mile-long section of US 34 in south central Iowa, beginning at the western limits of Clarke County and extending east through Lucas and Monroe counties to its junction with IA 5 near Albia. The Study will examine whether the existing facility is able to meet current and future travel and mobility needs and identify any potential improvement projects that may

be necessary to meet future demands. The Study is expected to take approximately 12 months to complete with a target date of May 2023.

The purpose of the meeting in Lucas County was to gather input from Lucas County and City of Chariton representatives on the Study and to discuss planned public outreach efforts.

Clarke County Feedback and Concerns

Questions

Q. Can shoulders be widened to meet the needs of the horse drawn carriages?

Context Audit

- Consensus is that US 34 generally meets the current needs of Clarke County in that there are no bottlenecks. However, regarding urban areas it was stated that US 34 will not meet future or current needs.

- US 34 is the emergency route for when I-35 is closed.

Locations with Issues or Concerns

- Officer Duffus noted there are odd crossovers on US 34 at Furnas Drive and in front of Pizza Hut near S. Ridge Road. Furnas Drive services the Altec Body Plant and McDonald's. There are some crashes at both crossovers. There is no storage on US 34 for vehicles turning south and so they stop in the median crossover to make their turn. The storage is only long enough for 1 car and school buses are longer than the crossover and so they stop on the inside through lane on US 34. Been fortunate to not have any significant incidents at the crossovers.

- There are blind spots near Pizza Hut – difficult to see cars approaching from the east with the existing hill near S. Ridge Road.

- Occasional wrong way drivers coming out of McDonald's. May need more or better signage.

- US 69 and Warren and US 34 & Southwest Boulevard are also problematic.

- Known issues at SW Boulevard including fatalities at the intersection into Walmart.

- US 34 and US 69 intersection can be problematic for turning trucks. They can't make the radius.

- Near Murray, westbound traffic on US 34 approaching R15 there is a passing/right turn lane that is a mess with problems with passing and turning at same time. Several accidents in this area.

- R16 near the cemetery has gawkers for the Veteran's Memorial.

Other Discussion Topics

- Iowa DOT asked about near miss accidents, calls and concerns that would not necessarily be recorded in crash reports.
  - R15/US 34 is a “hot mess” due to impatience and now has buggies to contend with
  - Near R15/US 34 a semi hit a buggy that killed the horse.
  - Amish travel US 34 to US 69 and go north to the United Farmers Coop for bagged feed. No issues noted.
  - The group commented that it is likely there are many near misses that go unreported.

Community Priorities

- Attendees would like any improvements to strongly consider imminent growth and allow for a proactive approach to development.
- South of US 34 and west of I-35 there is a planned 138-acre IEDA certified industrial park (E. Eddy Saylor Industrial Park) that is shovel ready.
- Altec employee parking is being expanded and that lot connects to S. Ridge Road. With additional homes in this area there will likely be increased volumes to the S. Ridge Road intersection at US 34.
- Residential development includes:
  - 44 new homes south of Walmart
  - More homes on Warren Avenue north of US 34 and the railroad.
- There is a growing Amish community in Clarke County, west of Osceola, in Murray. Increasing homes and businesses in the area. Safety concerns related to horse drawn buggies and increased foot traffic along US 34 were discussed. Amish travel from 110th Ave (farthest west) to 140th Ave (farthest east) in and out of Murray every day. They make do with existing shoulders, but wider shoulders would potentially be a benefit for buggy traffic. Amish traffic observed all the way to Osceola.
- A new lake is being planned as part of the Clarke County reservoir project 7 miles northwest of Osceola that is anticipated to draw traffic. Though some will use I-35 to access.
- Industrial growth is anticipated on the west side of Osceola.
- There is a proposed rail loop on the north side of Osceola related to United Farmers. The loop would be built to accommodate a 100 to 110 car grain train. For every 1 grain car there are 4 semis. Coming from east on US 34 and then north on US 69. If the project proceeds there would likely be a traffic impact study.

Previous Studies

- 2019 TEAP Study of the Warren Avenue Intersection. One suggested improvement was to convert the 1.25 mile divided 4-lane into a three-lane roadway but was stated as a long-term improvement. Warren Avenue serves Hormel/Osceola Foods. Not an ideal design that has resulted in traffic accidents. Other intersection improvements were proposed such as dedicated right turn lanes, offset left turn bays, and modernizing the traffic signals.

- 2020 TEAP Study of the US 69 Intersection.

Public Involvement

- No other stakeholders were suggested.

- Clarke Community School was recommended as a location for in-person public meetings.

- While some subscribe to the Osceola Sentinel Tribune, most get their news from social media, and city and county websites and City of Osceola and Clarke County Facebook pages.

Action Items

- None.

Small Group Stakeholder Meeting – Lucas County Development Corporation; US 34 Super Two Corridor Study

From: Torres-cacho, Hector <Hector.Torres-Cacho@iowadot.us>
Sent: Wednesday, April 26, 2023 11:05 AM
To: Harris, Gary <Gary.Harris@iowadot.us>; Miller, Trisha <Trisha.Miller@iowadot.us>
Cc: Bradley, Bryan <bryan.bradley@iowadot.us>; Younie, Bob <Bob.Younie@iowadot.us>; McElmeel, Steven <STEVEN.MCELMEEL@iowadot.us>; Wolf, Trevor <Trevor.Wolf@iowadot.us>; Finarty, Liz <liz.finarty@iowadot.us>
Subject: FW: US 34 Apr 13, 2023 Mtg Attendance

Hello all,
Below are the minutes from the meeting in Chariton. Please add to the list if comments were provided directly to you and not captured as part of the general discussion.
Gary and Trish, please make sure our consultant get these comments and all other comments received during our August and Nov input meetings.

Minutes:

1. Does US 34 meet the current transportation needs of the region and your business? If not, what/where are the problem areas?

- **Participant's Response**: From the Agriculture Business part of it, farming equipment is bigger than its been in the past, shoulders are not wide enough to provide safety and shoulders should be fully paved (not just rock). There has been lots of close calls. An extra 2-foot of paved shoulders would matter.
  - Iowa DOT: We are looking at a minimum of 6 feet paved shoulders up to 10-feet where condition allow it, and there is enough of a need without incurring large costs.
- **Participant's Response**: Johnson's Machine Works has taken 26-foot wide loads to Ames, the challenge was with a bridge down near Lucas, but since then it has been replaced. Wide and heavy loads should be further considered on US 34, everyone wants things bigger and shipped in one piece.
- **Participant's Response:** Where the IA 14 Jct is heading east up the hill there is a RR bridge just over the RR bridge there is a blind intersection at US 34 and 4th Street. There is a flashing light but during sunset it's a real tough situation, there have been crashes there but more needs to be done.
- **Participant's Response:** US 34 and 200th Ave. is dark and may need additional lighting, it's heavily used by Hy-Vee Trucks. Also talked about this intersection in August needing an EB turning lane. A lot of in-bound Hy-Vee trucks use that turn. There is lots of commercial traffic, and you have a climb on the hill.
  - Iowa DOT: So it would make sense to add a LFT-TL?
  - Response: Yes.

- **Participant's Response**: At the Russell Livestock Market it's really congested Sundays and Mondays (US 34 mile marker 150).

2. What future transportation challenges do you predict? How do you see US 34 addressing these challenges?

- **Participant's Response:** Hy-Vee and Agriculture have high volume of truck traffic. About 700 to 1000 inbound and outbound weekly from Hy-Vee, we see continued growth over the next 10 years.
    - **I**owa DOT: Would Hy-Vee be able to provide an average of trucks at specific intersections and future growth?
    - Hy-Vee responded Yes.

3. Are you aware of any future planned or upcoming developments that might impact traffic forecasts?

- **Participant's Response**: United Farmers COOP in Osceola plans to acquire approximately 170 acres adjacent to their existing site and build a 110-car rail loop, which will increase truck traffic.
- **Participant's Response:** Chariton looking is looking at identifying a location to apply for IEDA Certified Site Program.
- **Participant's Response:** Within the area we are looking where to add a 6 to 8 lane facility chicken operation which would bring much truck traffic.
- **Participant's Response:** Seats Incorporated is not present. They have available area south of them where there is potential for expansion. They bring a lot of steel by truck.
- **Participant's Response:** Chariton is looking at a trail that would connect the city to Red Hawk State Park that could be part of the US 34 Corridor, running parallel and crossing US 34 somewhere.

4. What should improvements to US 34 focus on? Safety? Mobility? Trucking? Growth and land use?

5. What factors and considerations are of most importance to your business when considering the future transportation network?

Regards,

HÉCTOR TORRES-CACHO, AICP
TRANSPORIGHTATION PLANNER
DISTRICT 5 OFFICE
iowadot.gov Iowa Department of Transportation

Office: 641-469-4007 @iowadot
Cell: 515-203-7551 Fax: 641-472-3622
Transportation absolutely remains a Civil Rights issue...Where we go opportunity goes and where we don't go there's no opportunity --- US DOT Secretary Anthony Foxx

MEETING REGISTRATION

Name: Jason Gibbs / Clarke Electric Cooperative	Name: Hilary Masters
Address/ Zip: 1803 N Main Osceola	Address/ Zip: 19937 535th Lane Chariton IA 50049
Email: jasgibbs@ccinet.net	Email: hilarymasters@hotmail.com
Phone: 641-342-2173	Phone: 641 203 1881
Number Attending: 1	Number Attending: 1
Name: Cathy Reece / Lucas Co Bd of Supervisors	Name: Denny Bisgaard
Address/ Zip: 916 Braden Chariton 50049	Address/ Zip: 604 N. 5th
Email: Supervisors@lucasco.org	Email: d.bisgaard@mchsi.com
Phone: 641-774-2018	Phone: 641-203-3442
Number Attending: 1	Number Attending: 1
Name: Denise Altenhofen	Name: Brian Sims
Address/ Zip: 26201 482nd St. Chariton IA 50049	Address/ Zip: 1260 N. 7th St Chariton 50049
Email: denise.altenhofen@gmail.com	Email: bsims@ichsia.com
Phone: 641-203-0993	Phone: 641-521-7006
Number Attending: 1	Number Attending: 1
Name: Karen Howell	Name: Tim McGee
Address/ Zip: 45636 167th AVE 50049	Address/ Zip: 618 N 7th St
Email: Karen.howell@fb.com	Email: timamcgee@gmail.com
Phone: 641-774-4700	Phone: 641-203-0383
Number Attending: 1	Number Attending: 1

FOR OFFICE USE ONLY

PROJECT: COUNTY: DATE:

IOWA DOT

MEETING REGISTRATION

Name: Matt Beenblossom - HY-VEE	Name:
Address/ Zip: 1801 Osceola Ave, Chariton	Address/ Zip:
Email: mbeenblossom@hy-vee.com	Email:
Phone: 641-774-7271	Phone:
Number Attending:	Number Attending:
Name: Shawna Savage-Evans	Name:
Address/ Zip: 1801 Osceola Avenue, Chariton	Address/ Zip:
Email: SSavage@hy-vee.com	Email:
Phone: 641-774-7207	Phone:
Number Attending: 1	Number Attending:
Name: Brad Baker	Name:
Address/ Zip: 728 Grace St	Address/ Zip:
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Phone: 641-202-1316	Phone:
Number Attending:	Number Attending:
Name: TODDA FOLKERTS	Name:
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Phone: (641) 774-4013 ext 6	Phone:
Number Attending:	Number Attending:

FOR OFFICE USE ONLY

PROJECT: COUNTY: DATE:

IOWA DOT

Small Group Stakeholder Meeting – Amish Community; US 34 Super Two Corridor Study

From: Torres-cacho, Hector <Hector.Torres-Cacho@iowadot.us>
Sent: Thursday, March 9, 2023 3:22 PM
To: Miller, Trisha <Trisha.Miller@iowadot.us>
Cc: Bradley, Bryan <bryan.bradley@iowadot.us>; Brewer, Valerie <Valerie.Brewer@iowadot.us>; Younie, Bob <Bob.Younie@iowadot.us>; McElmeel, Steven <STEVEN.MCELMEEL@iowadot.us>; Harris, Gary <Gary.Harris@iowadot.us>
Subject: RE: US34 Meeting Tomorrow 2/28/23

Trish, below are the minutes.

Public Outreach 2-38-2023 Minutes: Clarke County Amish Community (attendees between 16 to 18):

- Shoulders:
  - Preference are 10' wide paved shoulders (not PCC paved because it creates slick surface for horses),
  - Prefer fine rock on gravel sections of non-paved shoulders,
  - Add inside white line next to shoulder rumble strips.

- Traffic Warning Sign W11-14:
  - Requested additional W11-14 signage from east Clarke County line to Osceola.
  - Consider flashing W11-14 signs or supplemental plaques "Share the Road".
  - Increase size of the W11-14 signs.

- Horse-drawn Vehicles Design Consideration:
  - Extending passing lane (and better demarcating) at the intersection of 110th and US 34 (MP 103.90),
  - Add SB turn lane at the intersection of 120th and US 34 (MP 104.91),
  - Heavy traffic area near intersection Clarke County Rd. R15 (130th Ave) and US 34. Consider wider shoulders by the turn lane (and better demarcating the turn lane), and add night lighting on southside of US 34. Improve visibility of Stop signs.
  - Add turn lanes at 140th and US 34, heavy truck use (MP 106.88), and add night lighting.
  - At the intersection of Clarke County Rd R-21 (150th) and US 34 there is crest which creates site distance issues between fast-moving vehicular traffic when traveling WB on US 34 and slow-moving buggy cross traffic.

- Intersection at Warren Ave and US 34 (east of I-35 in Osceola) lots of conflict with truck traffic.
  - Suggested improvements:
    - Right turn radius from EB US 34 to SB Warren Ave not wide enough and trucks off-track, and at time it's a conflict point between horse-drawn vehicles and motorized vehicles,
    - Extend timing of the traffic signals to allow horse-drawn Vehicles time to turn left (NB Warren Ave onto WB US 34 movement),
    - Add pedestrian push button to existing traffic signal to allow manual activation of the traffic signal,
    - Consider W11-14 signage,
    - Include wider shoulders to function as refuge when turning right on Warrant Ave or left on US 34.
- Amish members travel to Murray from all directions and travel on US 34 to Walmart in Osceola.
- Amish school age children drive buggies and there are general safety concerns with conflicting truck traffic.

Regards,

HÉCTOR TORRES-CACHO, AICP
TRANSPORIGHTATION PLANNER
DISTRICT 5 OFFICE
iowadot.gov Iowa Department of Transportation

Office: 641-469-4007 @iowadot
Cell: 515-203-7551 Fax: 641-472-3622
Transportation absolutely remains a Civil Rights issue...Where we go opportunity goes and where we don't go there's no opportunity --- US DOT Secretary Anthony Foxx

APPENDIX B – GENERAL COMMENTS FROM PIM #1

A virtual public meeting was held on November 16, 2022. Of those who visited the website and reviewed the materials, 16 commented or asked questions and requested a response from the IA DOT. For privacy, only the city address is shown, along with the comment and response.

1. Chariton: We are wondering what the US 34 Super-2 Planning Study in Lucas County consists of.

IA DOT Response: XXX, let my start by saying the aim of a Super-2 highway design is to enhance mobility and safety while maximizing the benefits of existing two-lane roadways by lowering right-of-way needs and construction and maintenance costs.

To help determine which corridors to study for Super-2 improvements, data -driven analysis was performed. This analysis included the evaluation of crash statistics, roadway grades, traffic volumes, average trip lengths, statewide connectivity, and existing network designations, to name a few attributes considered.

Some defining features of Super-2 improvements are the addition of passing lanes (providing opportunities to pass slower-moving vehicles), climbing lanes at location where steep grades exist, turning lanes at certain locations, improved access control, and paved shoulders.

The Planning and Environmental Linkages (PEL) US 34 Super-2 study objective is to gain an understanding of the corridor's existing conditions and infrastructure, determine the roadway cross-section needed to meet current and future traffic mobility and safety needs, and to develop and prioritize a range of potential improvement projects that could be considered for the corridor.

Thank you for taking time to submit a question, please let us know if you have additional questions.

2. Murray: What is US highway 34 still dies (sic) purpose?

IA DOT Response: XXX, I assume you are asking about the purpose of a Super 2. If correct, let my start by saying the aim of a Super-2 highway design is to enhance mobility and safety while maximizing the benefits of existing two-lane roadways by lowering right-of-way needs and construction and maintenance costs.

To help determine which corridors to study for Super-2 improvements, data -driven analysis was performed. This analysis included the evaluation of crash statistics, roadway grades, traffic volumes, average trip lengths, statewide connectivity, and existing network designations, to name a few attributes considered.

Some defining features of Super-2 improvements are the addition of passing lanes (providing opportunities to pass slower-moving vehicles), climbing lanes at location where steep grades exist, turning lanes at certain locations, improved access control, and paved shoulders.

That said, the Planning and Environmental Linkages (PEL) US 34 Super-2 study objective is to gain an understanding of the corridor's existing conditions and infrastructure, determine the roadway cross-section needed to meet current and future traffic mobility and safety needs, and

to develop and prioritize a range of potential improvement projects that could be considered for the corridor.

Thank you for taking time to sending us your question, and please let us know if you have additional questions.

3. Chariton: the more improvements the better, would like to see all 4 lane

4. Chariton: Will property owners be notified if part of their property is to be taken in order to create the Super 2 highway? If so, how soon?

IA DOT Response: XXX, let me start by saying the aim of a Super-2 highway design is to enhance mobility and safety while maximizing the benefits of existing two-lane roadways by lowering right-of-way needs and construction and maintenance costs.

What we are doing currently is only studying the US 34 corridor. The Planning and Environmental Linkages (PEL) US 34 Super-2 study objective is to gain an understanding of the corridor's existing conditions and infrastructure to determine the roadway cross-section needed to meet current and future traffic mobility and safety needs, and to develop and prioritize a range of potential improvement projects that could be considered for the corridor. That said, in the future, when a project is identified we will assess ROW needs. If ROW acquisition is required, we would contact any impacted property owner at that time. At this time, we are not at the project development stage to know what if any ROW will be needed. The aim though, as stated above, is to maximize the benefits of existing two-lane roadways by lowering right-of-way needs in our design.

5. Chariton: The passing zone to the east of and in the front of 277th Ave needs to be changed to a no passing zone. There is a big enough jog in the road that when driving eastbound behind another car, it appears as if there is no traffic in the north lane driving west. In reality, the eastbound driver looks around the car in front of him/her they aren't even seeing the north lane, so it looks clear to pass. Then the eastbound driver pulls out to pass and pulls right into the lane of the westbound vehicle. There have been at least 3 head-on collisions here within the last 20 years. Two of them resulted in deaths.

6. Chariton: To help build/enhance our City Lakes across hi-way 34 from Red Haw State Park, we would love to make sure an underpass/crossing gets planning for between Red Haw State Park and Lake Ellis.

7. Chariton: Do any of these plans include the potential for widening 34 to an all 4 lane, because we definitely don't support that. Also, these super twos only work if they're long enough to allow safe passing. Too often they are too short and cause more problems than they alleviate. Thanks.

IA DOT Response: XXX, widening the US 34 corridor to construct a 4 lane is not the plan. The Planning and Environmental Linkages (PEL) US 34 Super-2 study objective is to gain an understanding of the corridor's existing conditions and infrastructure to determine the roadway cross-section needed to meet current and future traffic mobility and safety needs, and to develop and prioritize a range of potential improvement projects that could be considered for the

corridor. Some defining features of Super-2 improvements are the addition of passing lanes (providing opportunities to pass slower-moving vehicles), climbing lanes at location where steep grades exist, turning lanes at certain locations, and paved shoulders.

8. Chariton: The highway 34 bridge over the BN railroad is a hazardous blind spot for wide farm equipment. If and when that bridge is replaced, a wider bridge would be much safer for farm equipment to utilize.

9. Melrose: 1) can one obtain a copy of your design guide/criteria? 2) Will existing access from private property to this type of roadway be reduced, e.g., frontage roads, other relocations and combined access? 3) Does shoulder paving affect the existing ROW? 4) If you do a super-2 highway does that take a future divided/4 lane highway off the table? 5)how will you prioritize this work with other projects, criteria?

IA DOT Response: XXX, here is the URL to access our current Super Two Highway design guidelines (6C-2): https://iowadot.gov/design/dmanual/06c-02.pdf. Please be advised that we are working on updating the existing Super-2 guidelines and we may have new guidelines completed in the next year or two.

At this point in the process, it is too early to be specific on design needs that would impact existing frontage roads, access points or private property. Shoulder paving would not typically affect existing ROW. The aim of a Super-2 highway design is to enhance mobility and safety while maximizing the benefits of existing two-lane roadways by lowering right-of-way needs, construction and maintenance costs.

Iowa DOT is no longer considering constructing a four-lane along the U.S. 34 corridor Super-2 Study area. We believe, Super-2 improvement can provide many of the benefits of a four-lane corridor without the excessive cost and impacts.

There are two separate processes for implementing Super-2 improvements. The first is by looking at planned pavement rehabilitation projects and assessing whether Super-2 design elements can be incorporated into the project. The other process for identifying Super-2 projects is through corridor planning studies. Prioritizing projects will following data driven decision that identify where we have significant infrastructure and safety needs.

10. Peru: Supportive of this project at this time but do need additional information

IA DOT Response: XXX, what information would you like? Have you viewed our online prerecorded presentation? https://www.news.iowadot.gov/pim/2022/11/us-34-super-2-planning-study-to-be-discussed-inchariton-on-november-16-2022.html

Feel free to email or call me directly.

11. Lucas: How will this mess with people on north side of tracks east of Lucas?

IA DOT Response: XXX, Super-2 improvement will more than likely only happen on the highway. Private property separated from the U.S. 34 highway by railroad and frontage road should not be affected by potential climbing lanes, passing lanes, or wider shoulders

improvements on the U.S. 34 highway. If your property is impacted by unforeseen ROW needs, we will contact you before proceeding with a project.

12. Lucas: We have a well on our property that looks like will be taken out. This is our water source.

IA DOT Response: XXX, first, thank you for taking time to submit your question. If possible, would you call or email me directly so I can better identify the location of the well you are bringing to our attention.

As part of the U.S. 34 PEL Super 2 study we are not identifying right-of-way needed for acquisition. The black hatch marks on the displays represent our study area for the PEL, it is not a ROW need line. Second, Super-2 improvement will likely only happen on the highway. According to Display sheet page 9 of 19 (https://iowadot.gov/pim/documents/US34_CompleteSet.pdf) your property is separated from the U.S. 34 highway by railroad and a frontage road.

Please let me know if you have any additional comments or questions.

13. Des Moines: I am concerned that the project area includes the north road, and graves thereon, to the Chariton Cemetery. I think this is a great, and long overdue, project and I am hoping that the intersection of Hwy 34 and Hwy 14 does not need to encroach on the cemetery. While I am a Des Moines resident now, my roots are in Lucas County, and I am a long-time member of the Lucas County Genealogy Society. Thanks.

IA DOT Response: XXX, as part of the U.S. 34 PEL Super 2 study we are not identifying right-of way needed for acquisition. The black hatch marks on the displays represent our study area for the PEL, it is not a ROW need line.

We are also aware that the Chariton Cemetery is identified as a historic district, and whenever a project concept for potential improvements is prepared we will identify the cemeteries to be evaluated and discussed during design.

14. Osceola: The intersection of 34 and 69 does not support 18-wheeler traffic very well. Semis have a difficult time turning west onto 34 from 69 from the north and the south. The crosswalks are not properly placed, and the whole intersection needs improvements for safety and functionality.

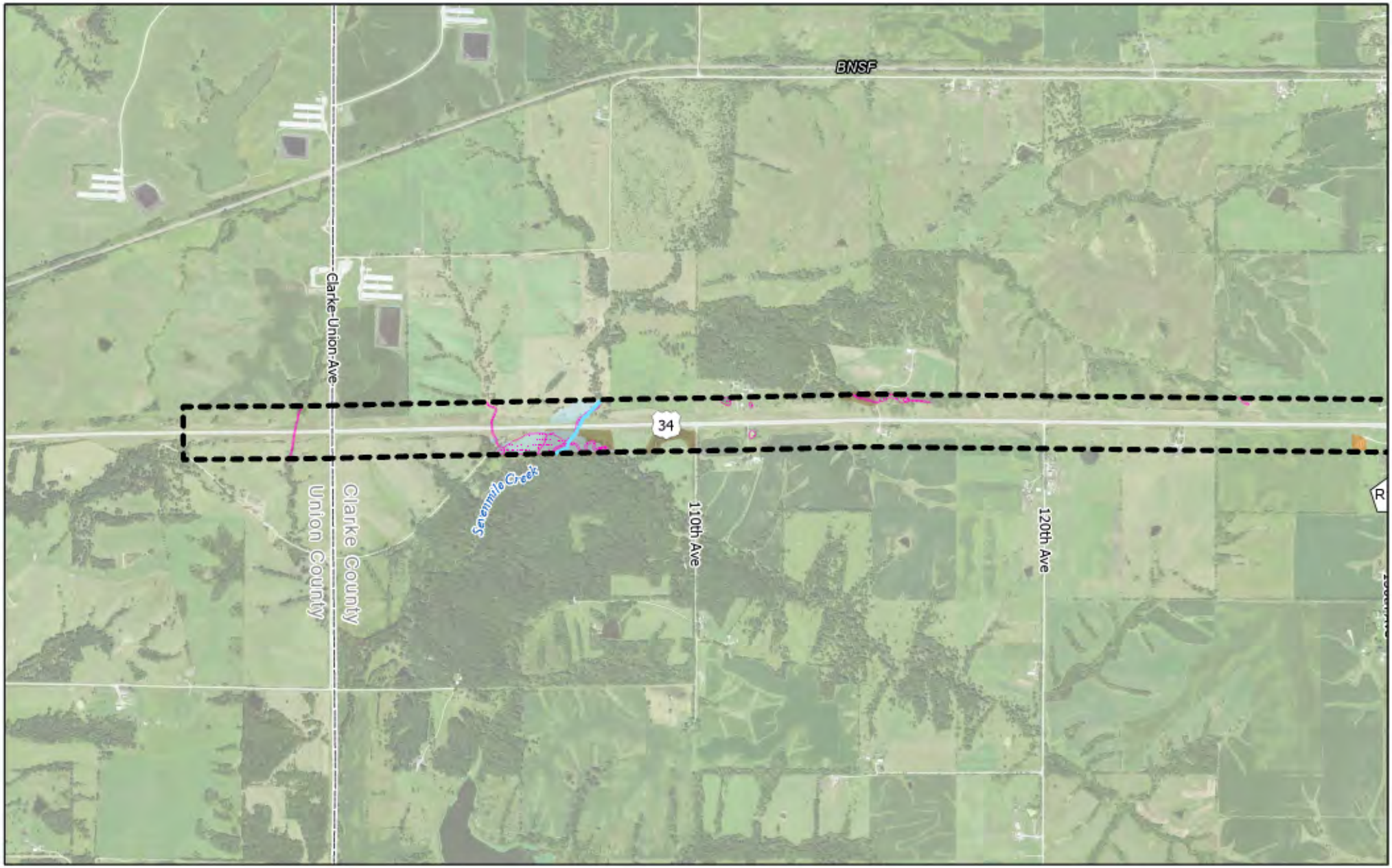
15. Bevington: I would like to be put on an E Mail update for the HWY 34 project as I own land just XXX. E Mail Address is XXX.

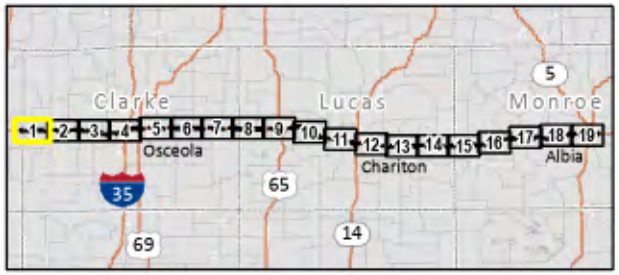
IA DOT Response: You are already on our contact list. We also have a mailing address for you in Bevington.

16. Chariton: Support much needed improvements to this highway to make it safer for traffic turning on/off. Also, great opportunity to add signage along highway that highlights dining, lodging, and other attractions in each town.

APPENDIX C – GENERAL COMMENTS FROM PIM #2

APPENDIX D – DESKTOP ENVIRONMENTAL CONSTRAINTS WITHIN THE STUDY AREA





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Base Map Source: NAIP Imagery
Data Sources: IADOT, IADNR, FEMA

Environmental Constraints
US 34 Super Two Study

Jacobs

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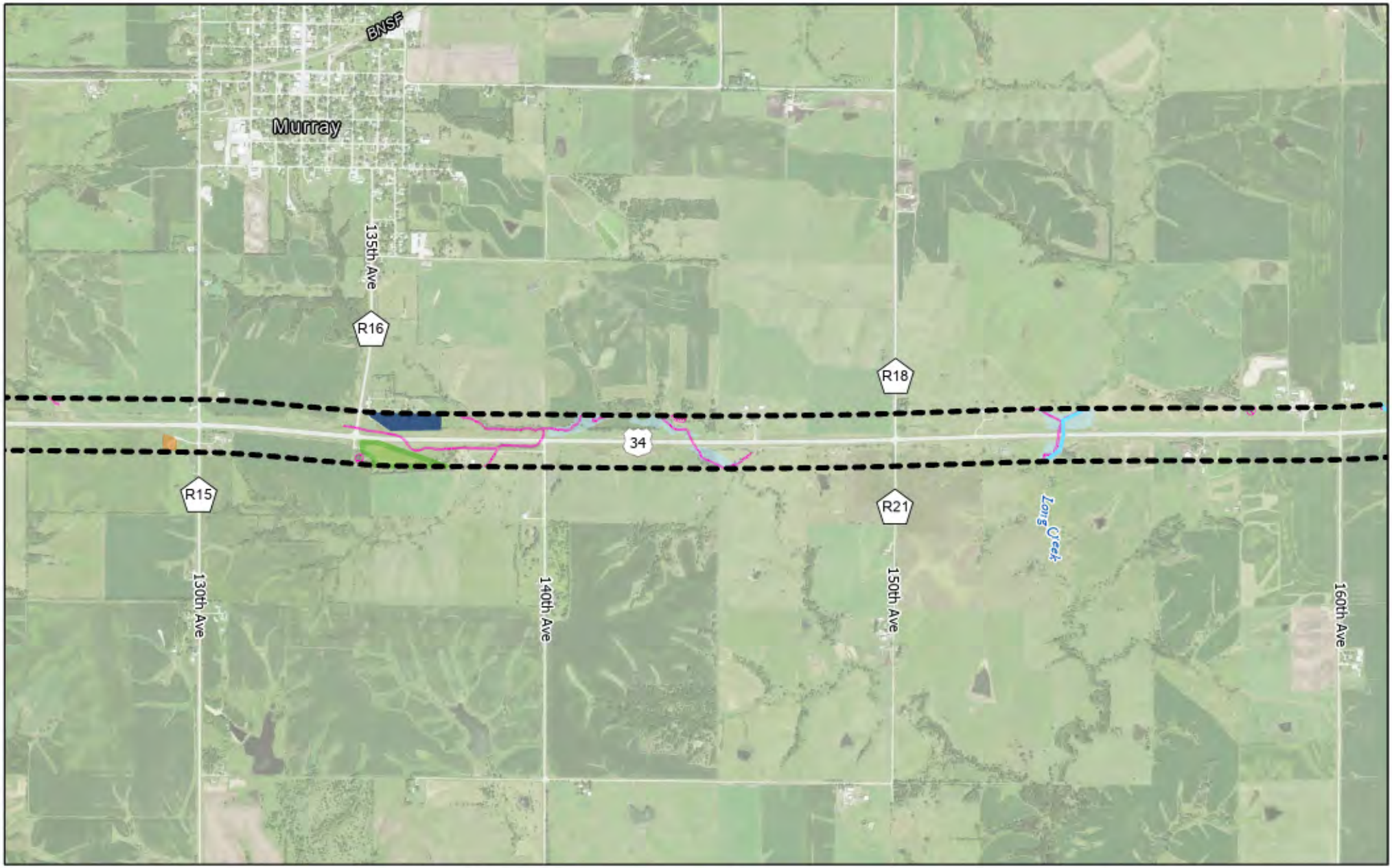

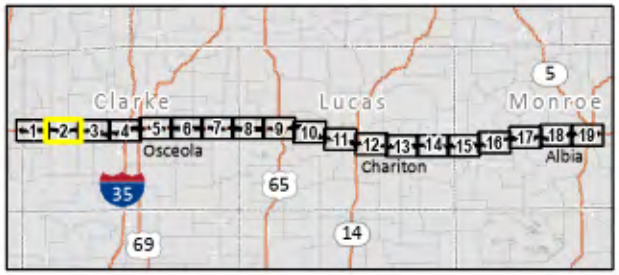

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US 34 Super Two Study

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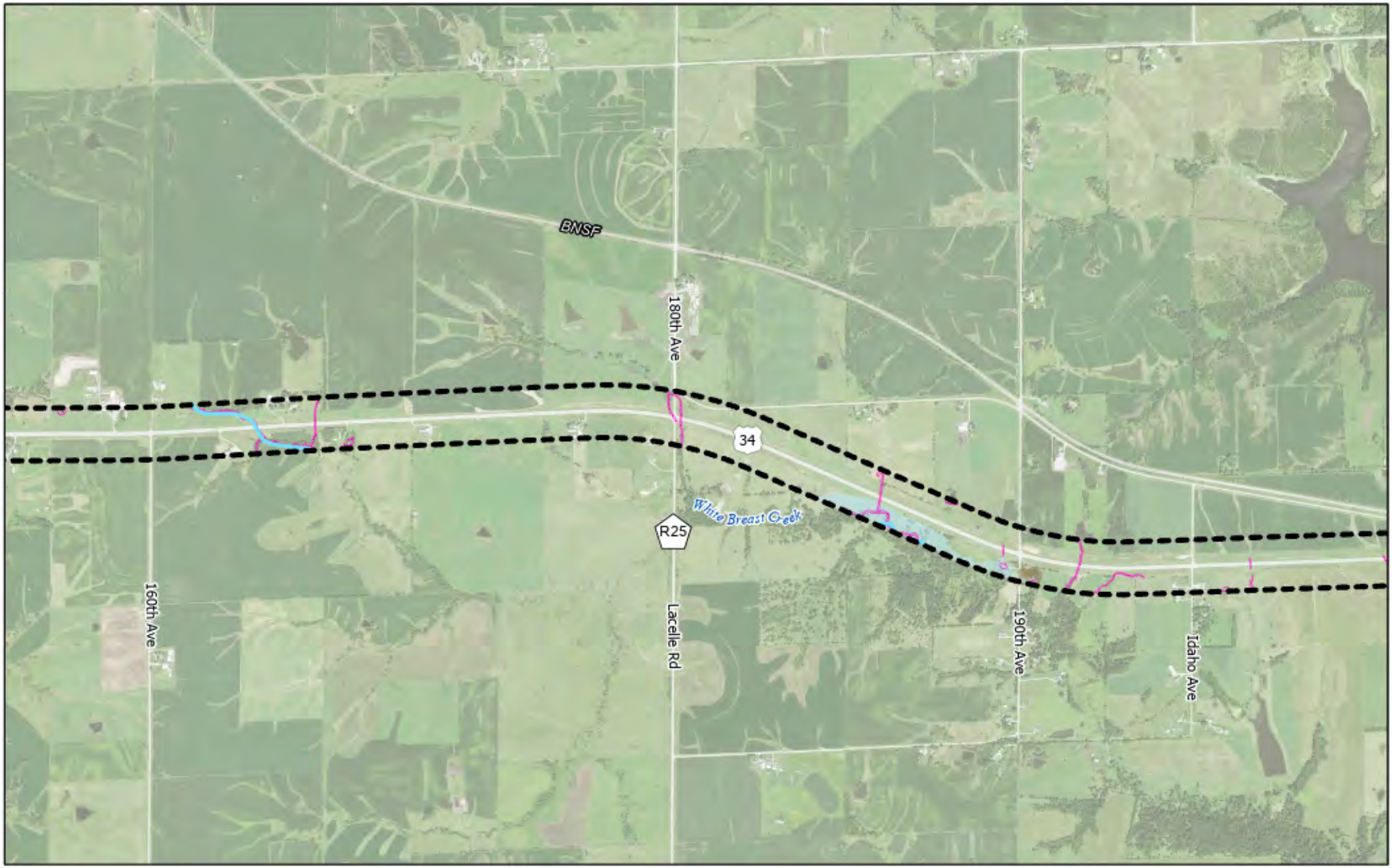

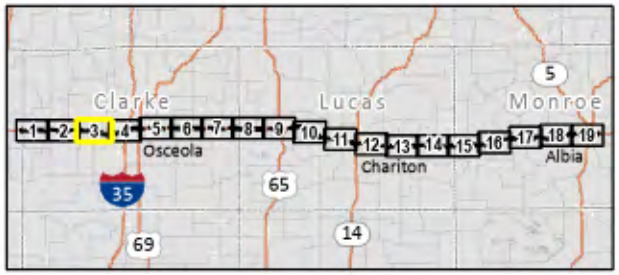

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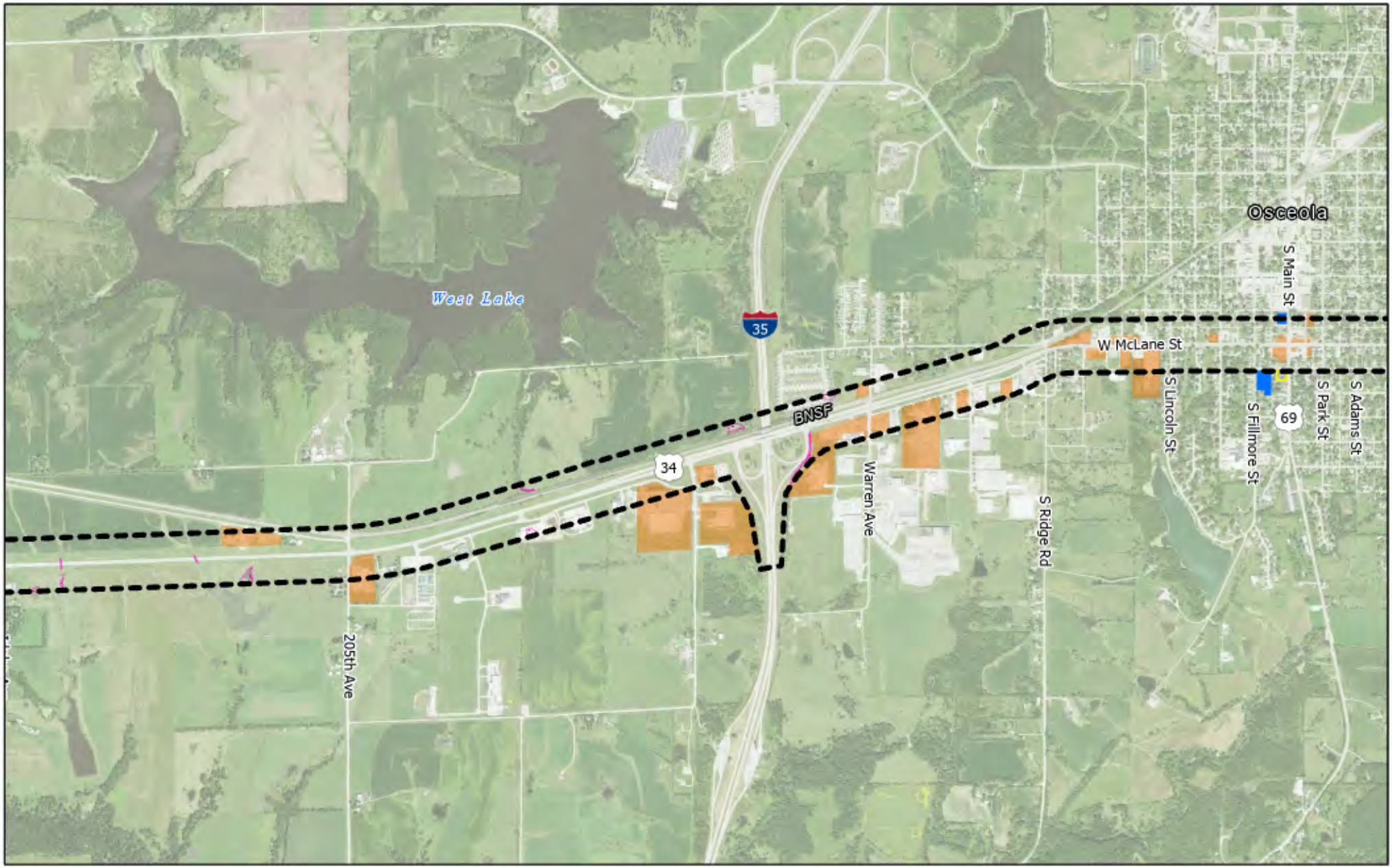

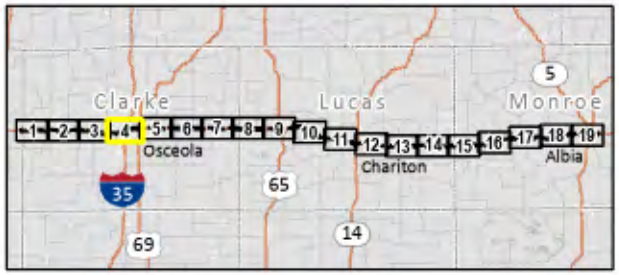

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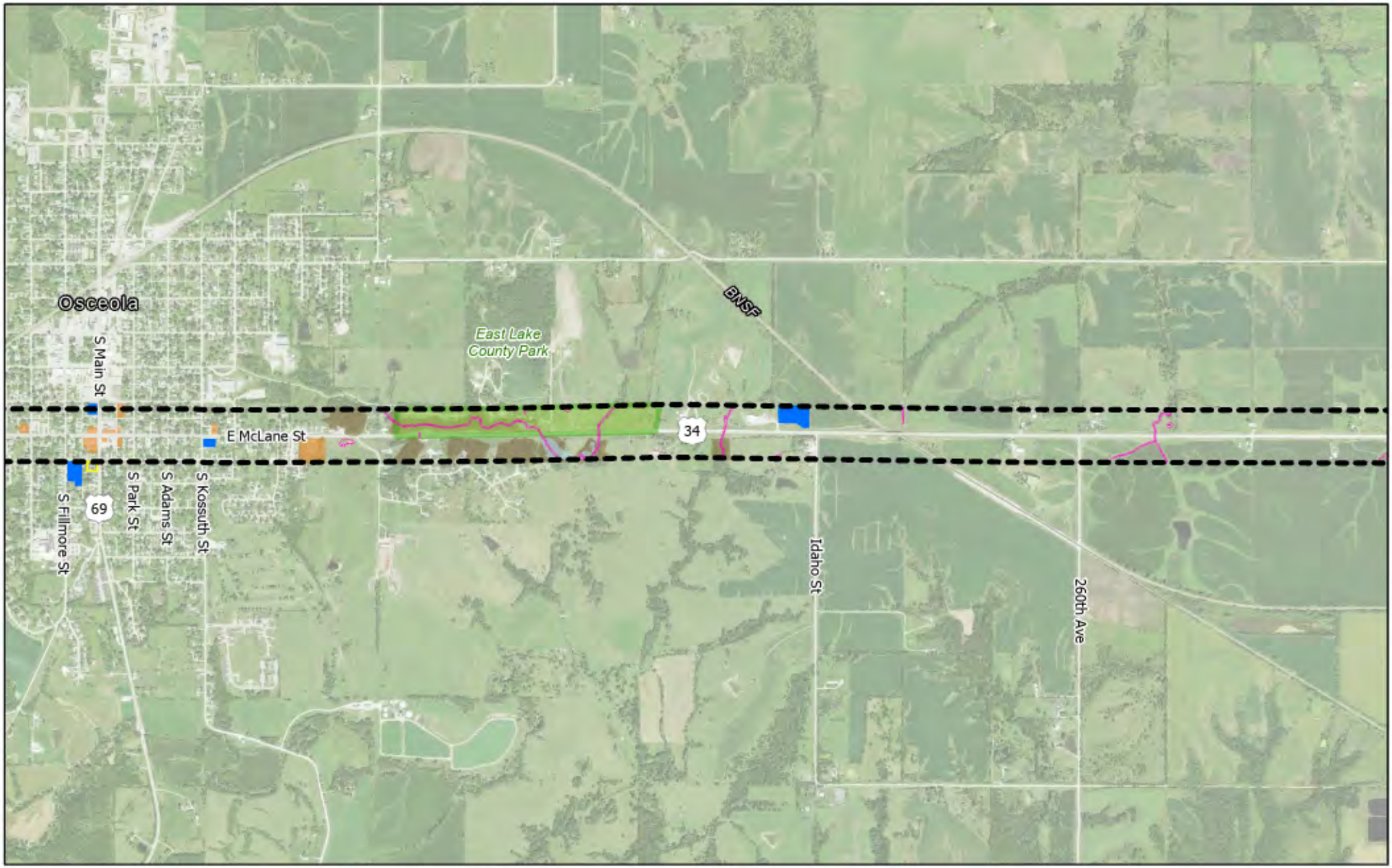

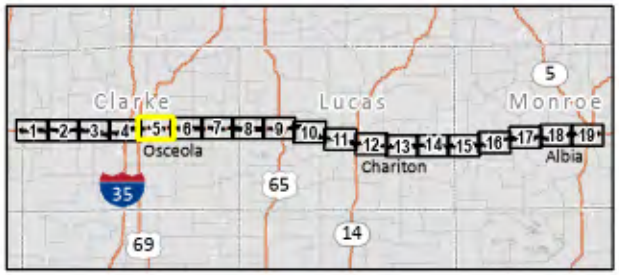

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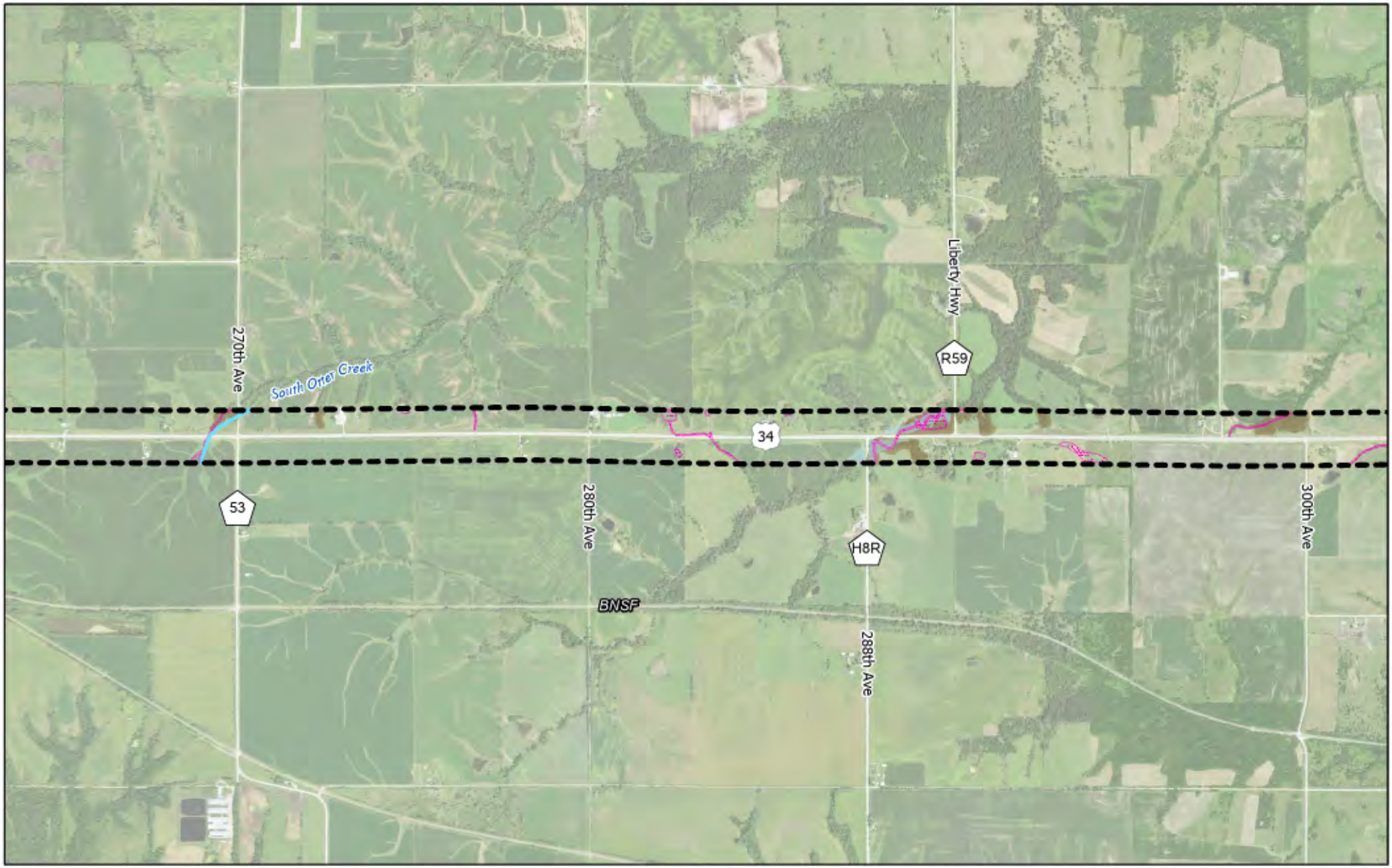

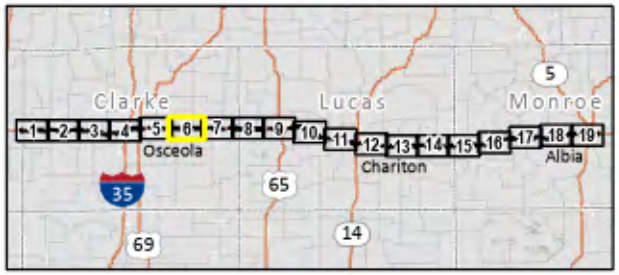

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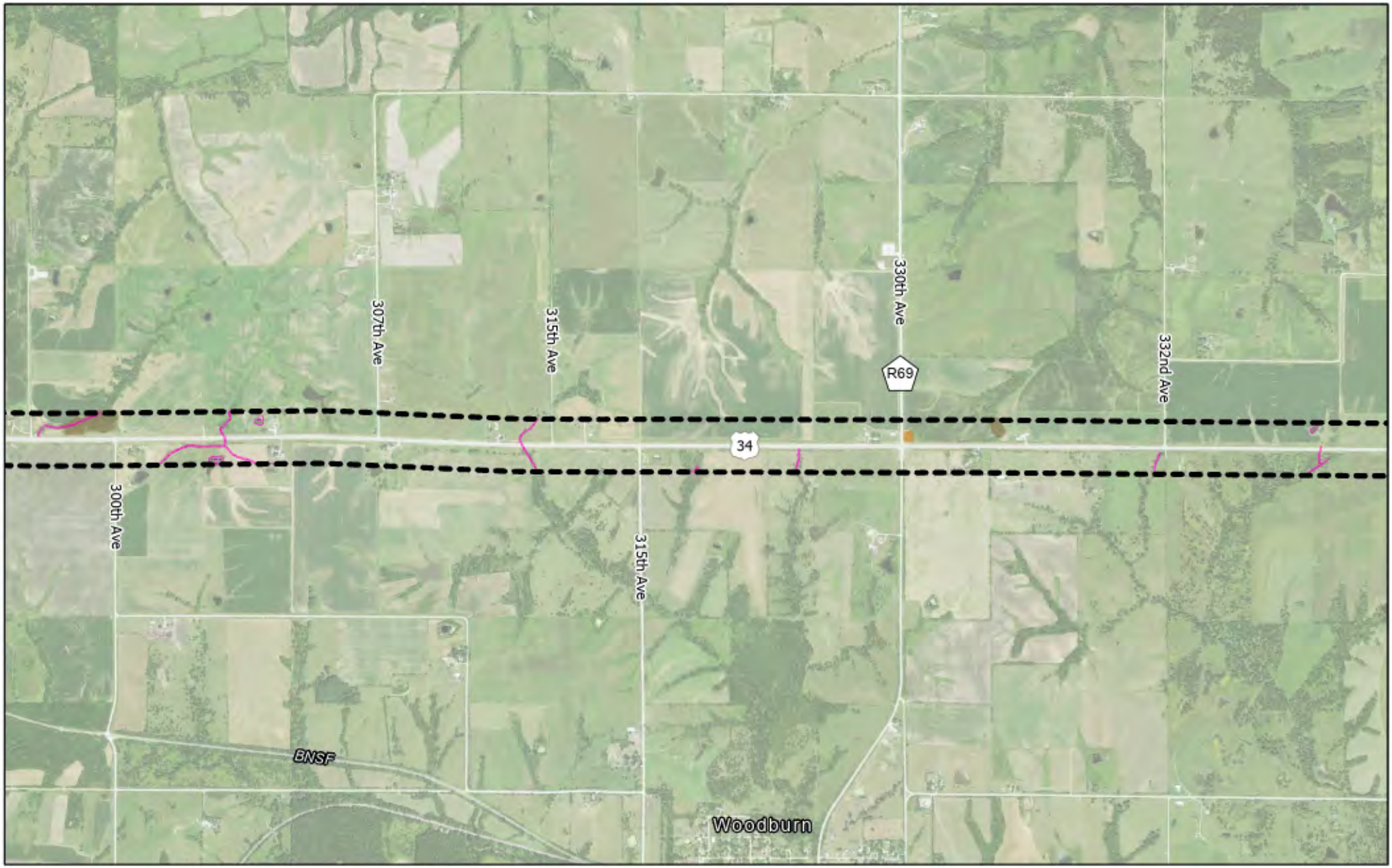

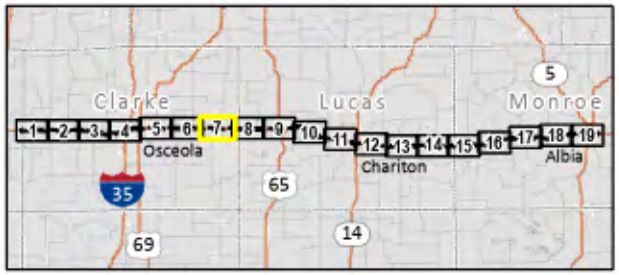

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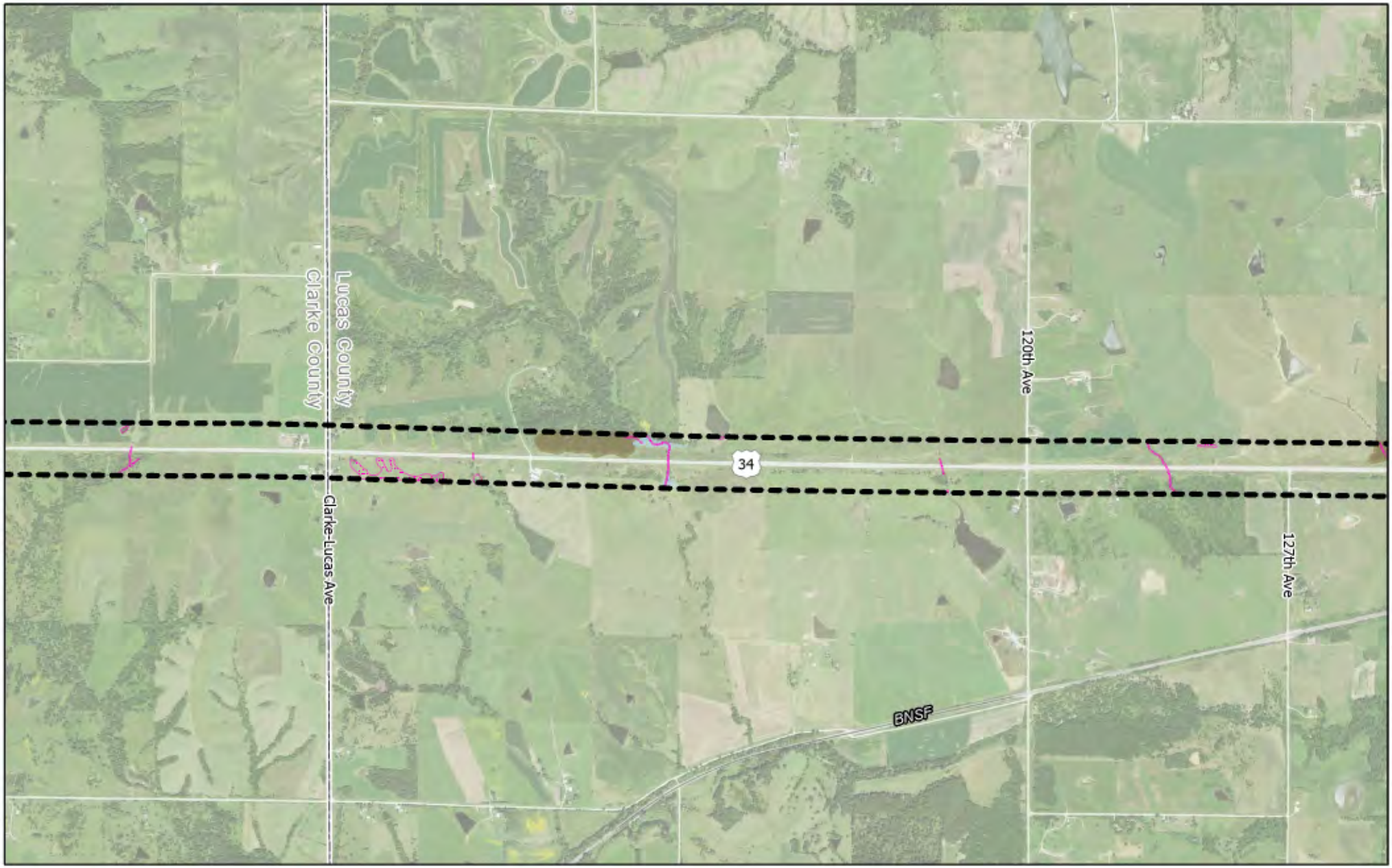

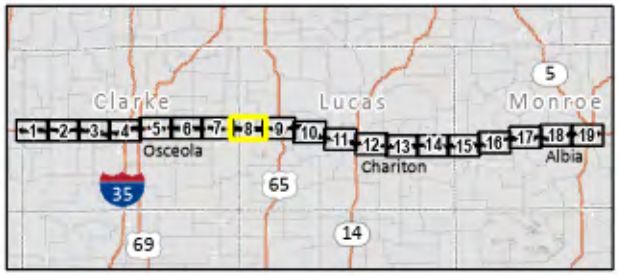

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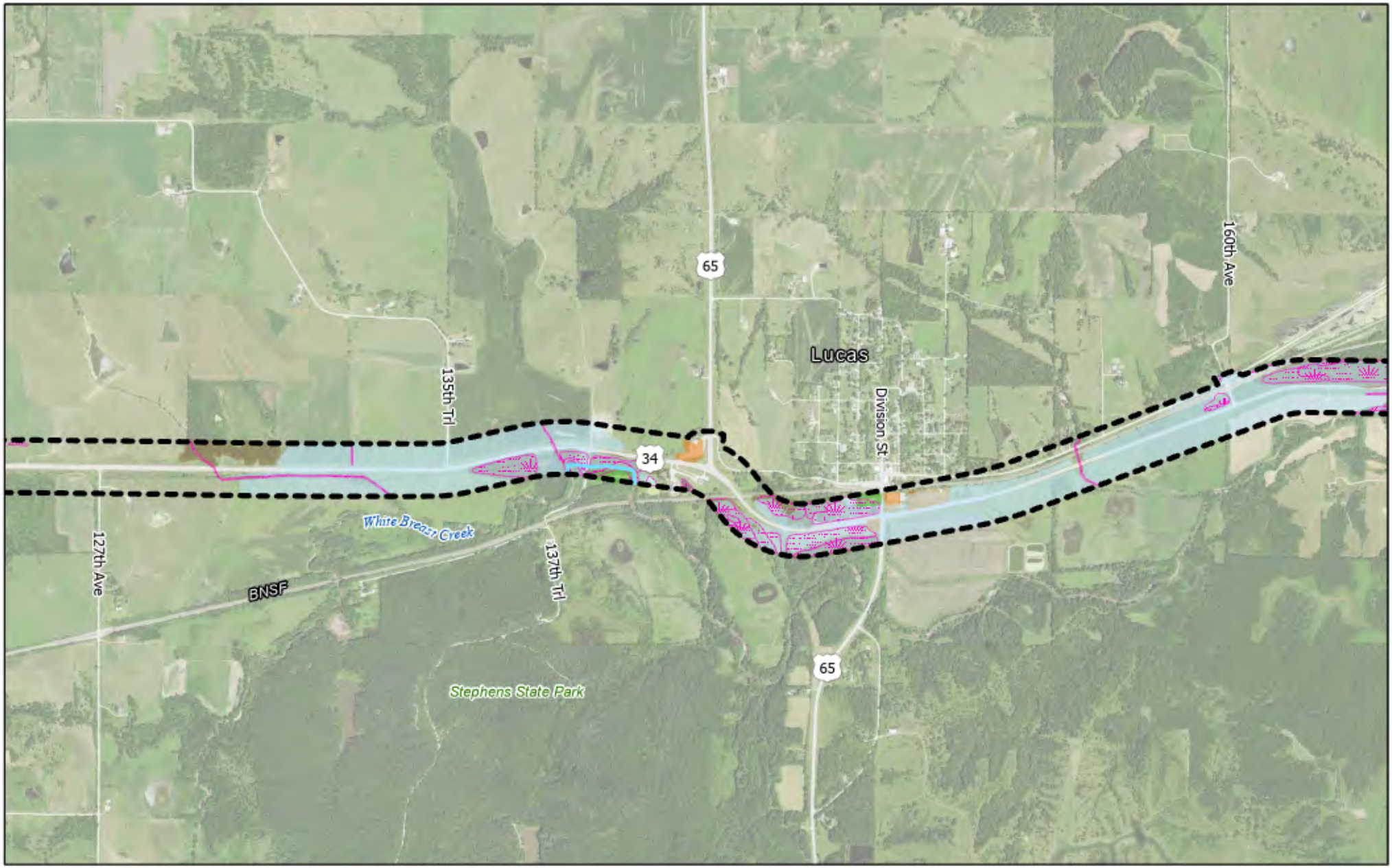

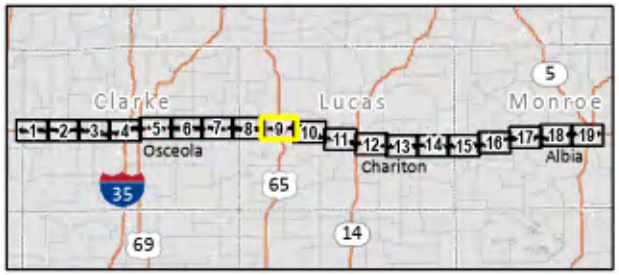

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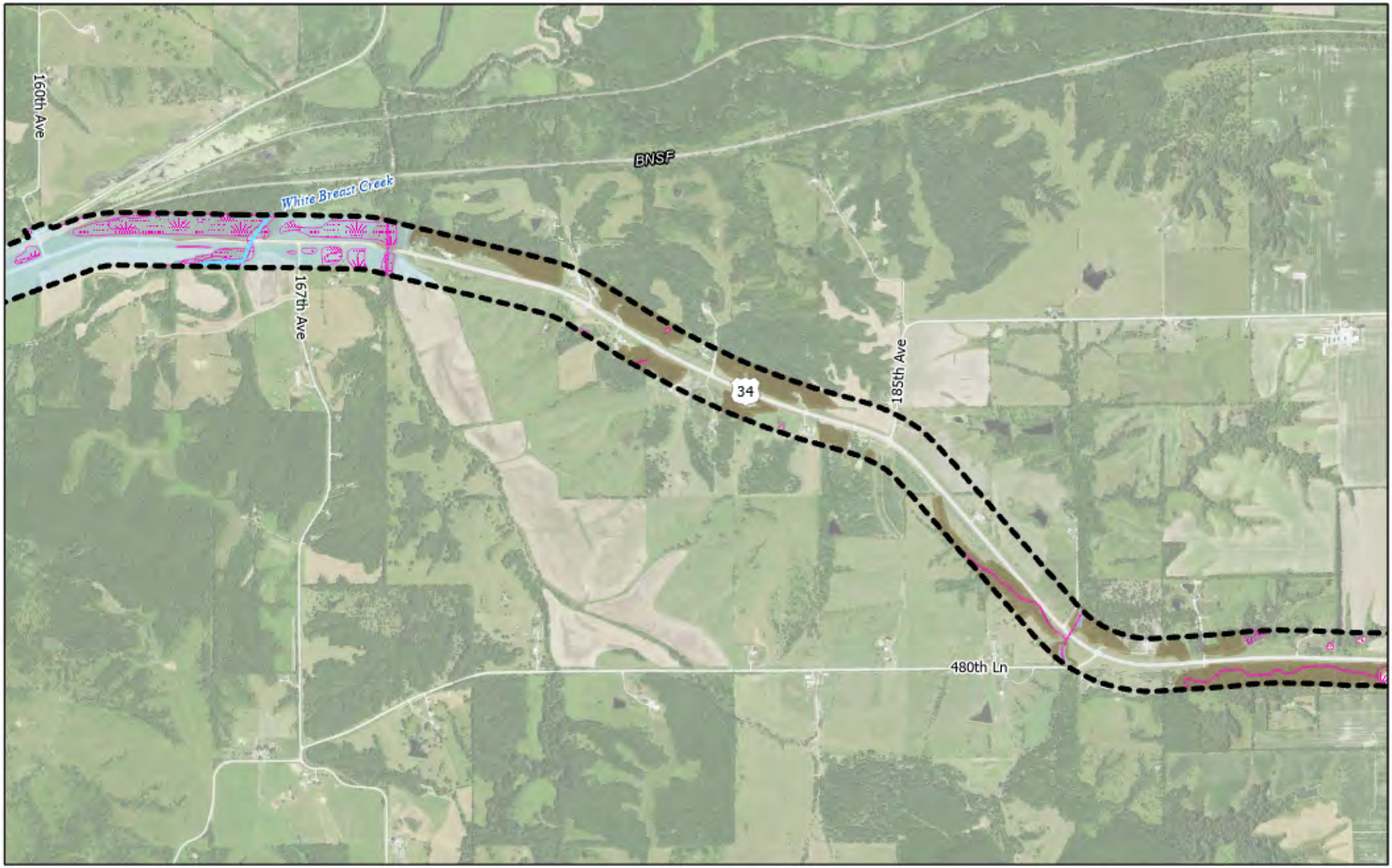

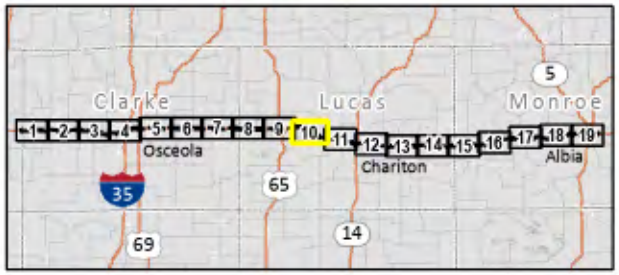

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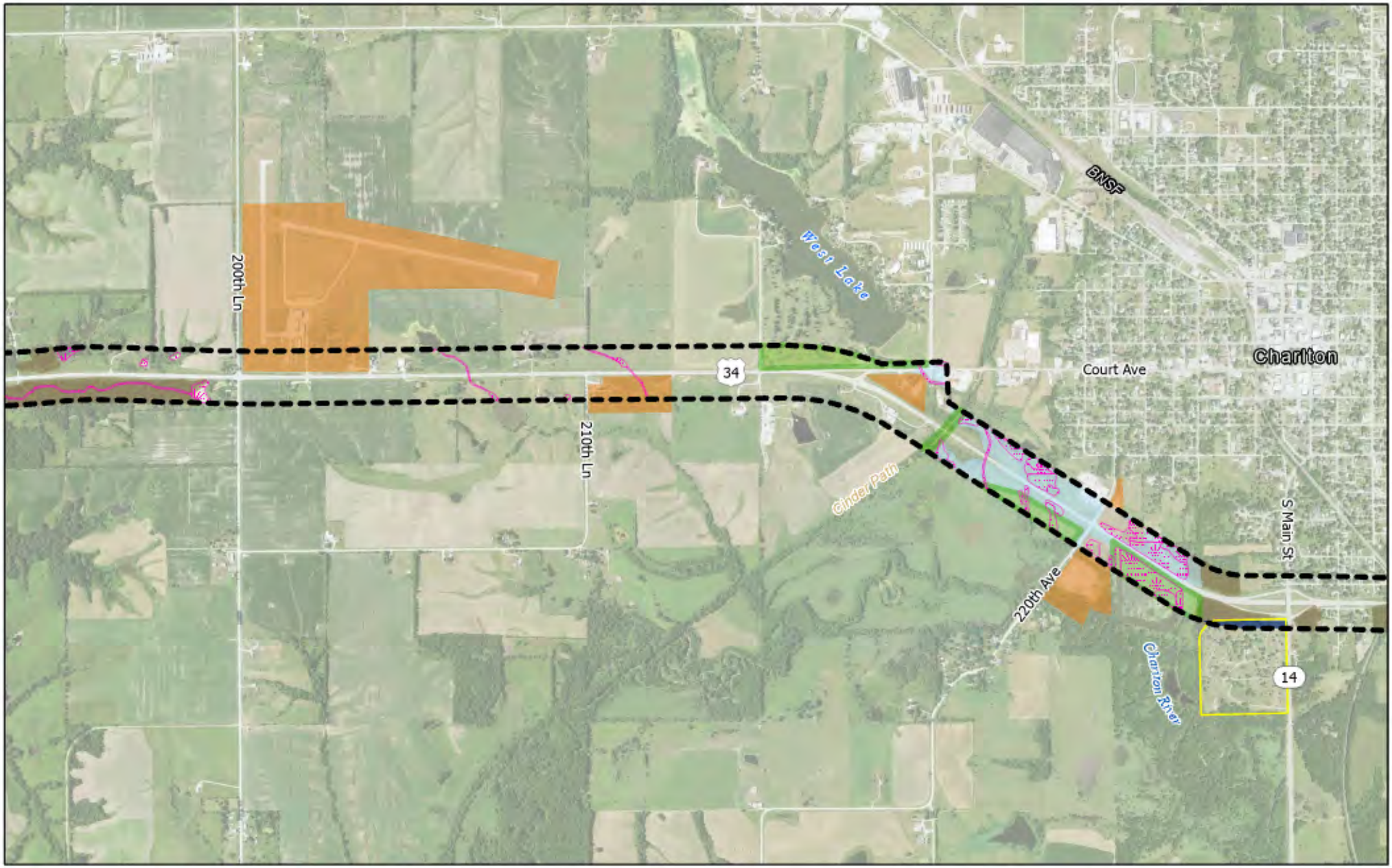

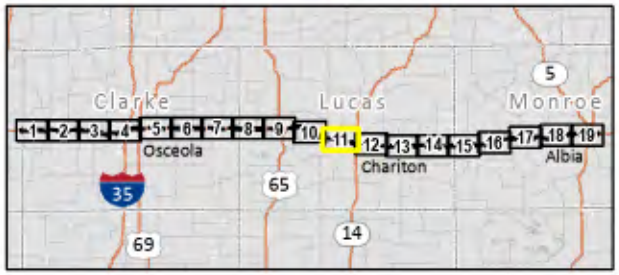

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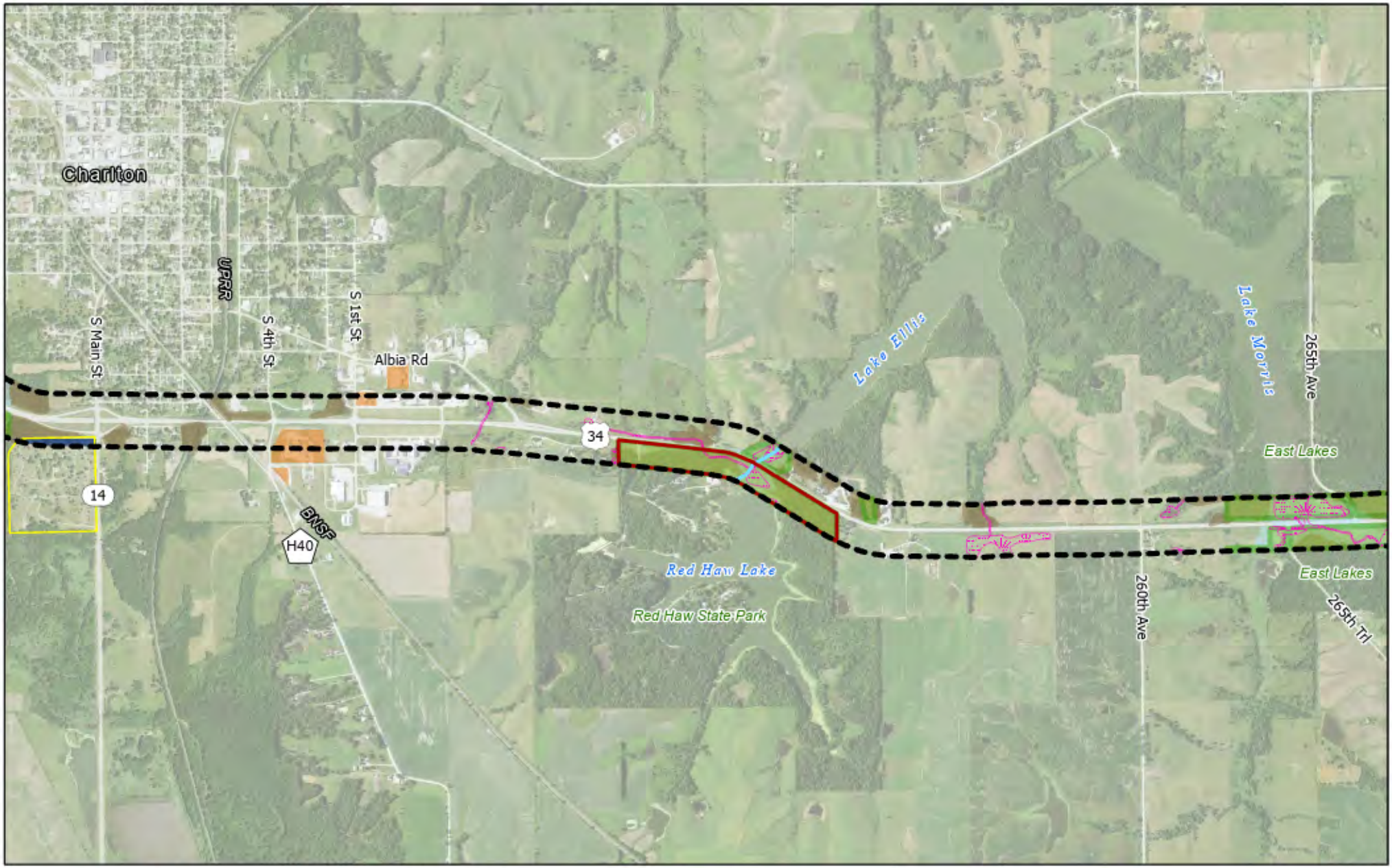

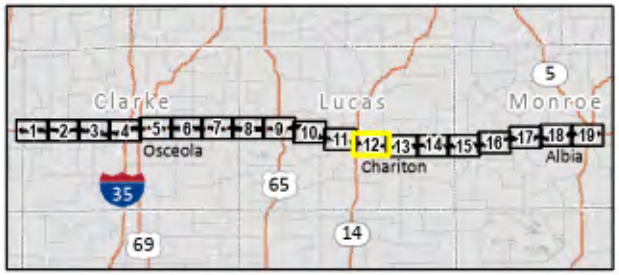

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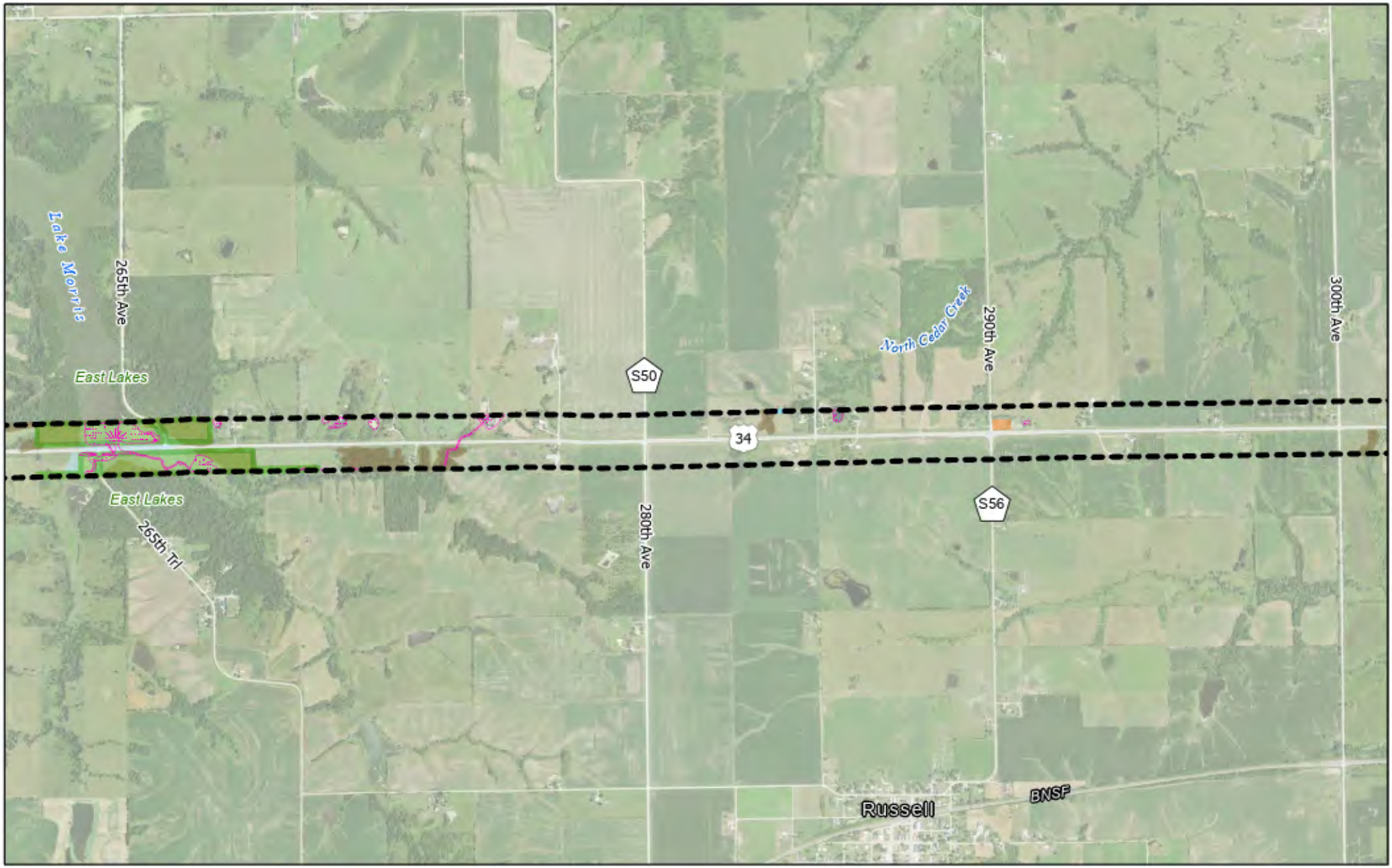

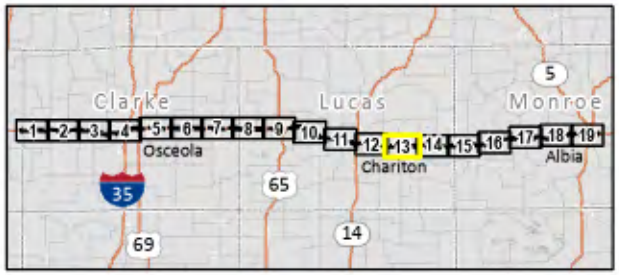

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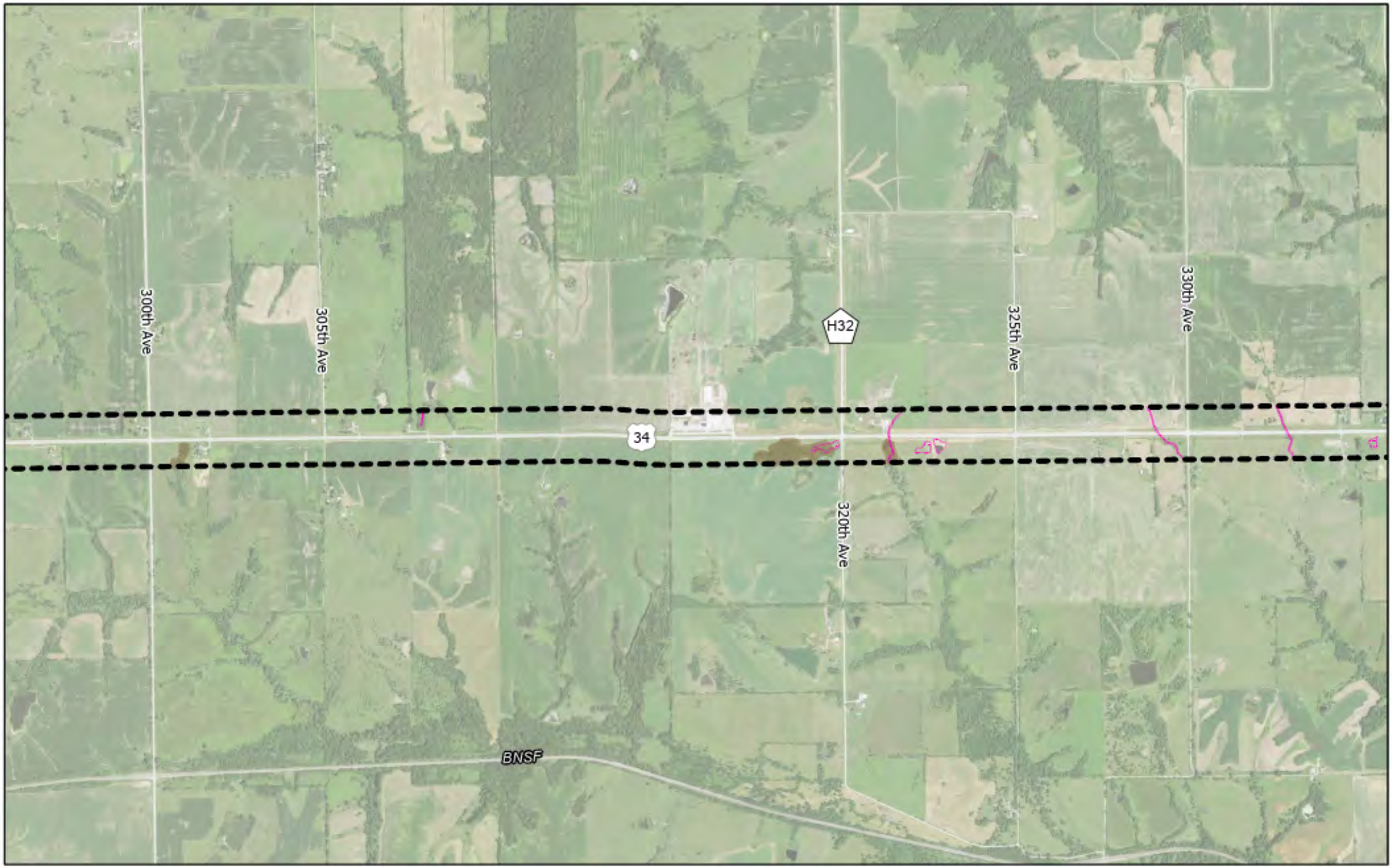
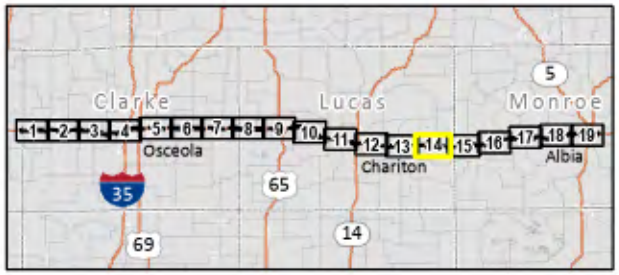




- Study Area
- NRHP Cultural Resouce Site
- Sovereign Land
- Waterway
- Wetland
- Floodplain
- Recreation Area
- Woodlands/Bat Habitat
- Cemetery
- Church
- Regulated Material

N

0 1,000 2,000

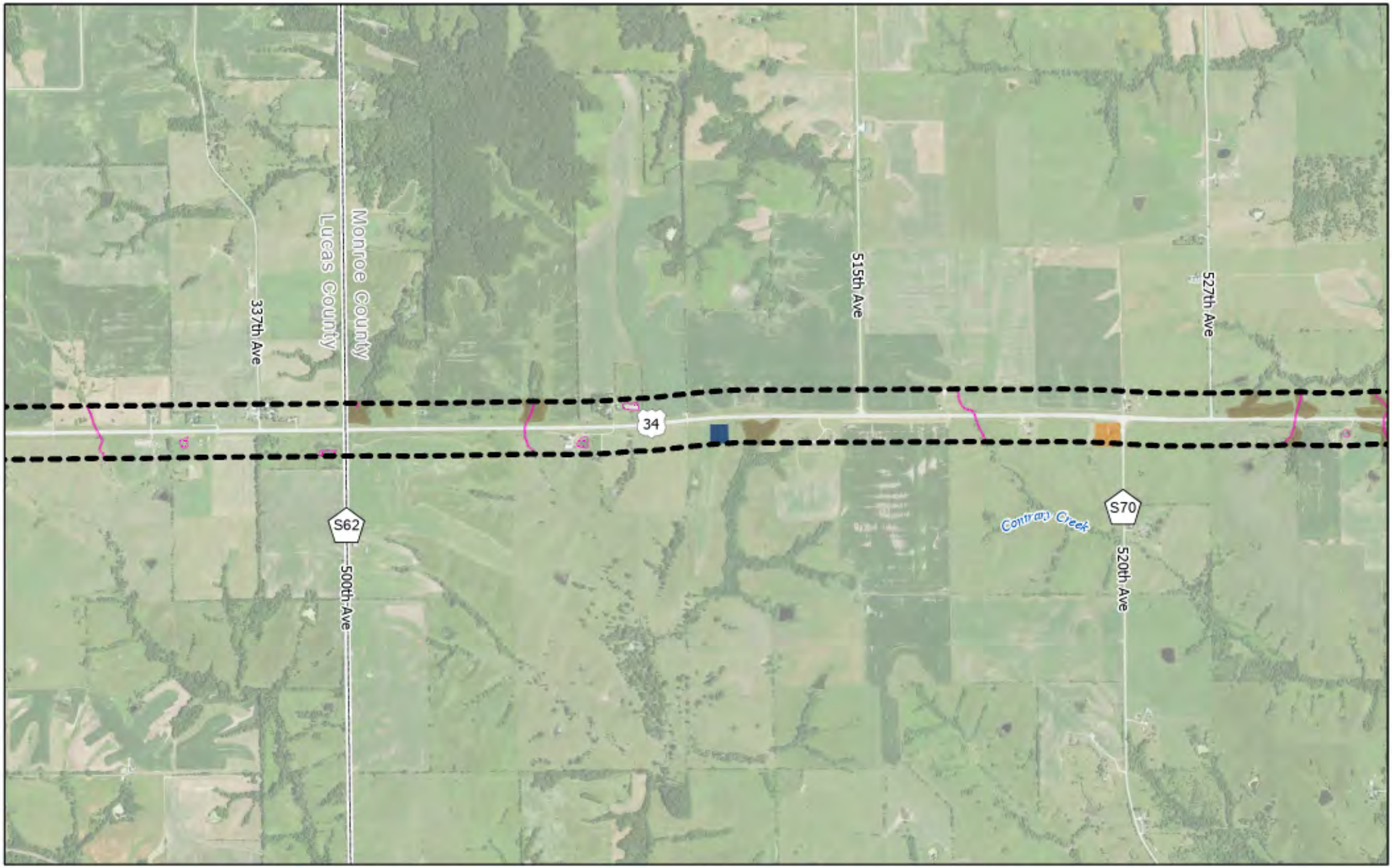
Feet

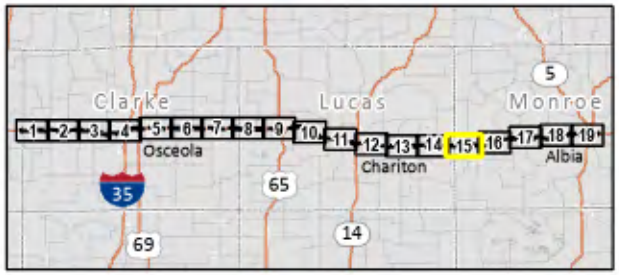
Base Map Source: NAIP Imagery
Data Sources: IADOT, IADNR, FEMA

Environmental Constraints
US 34 Super Two Study

Jacobs

IOWADOT





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Feet

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Environmental Constraints
US 34 Super Two Study

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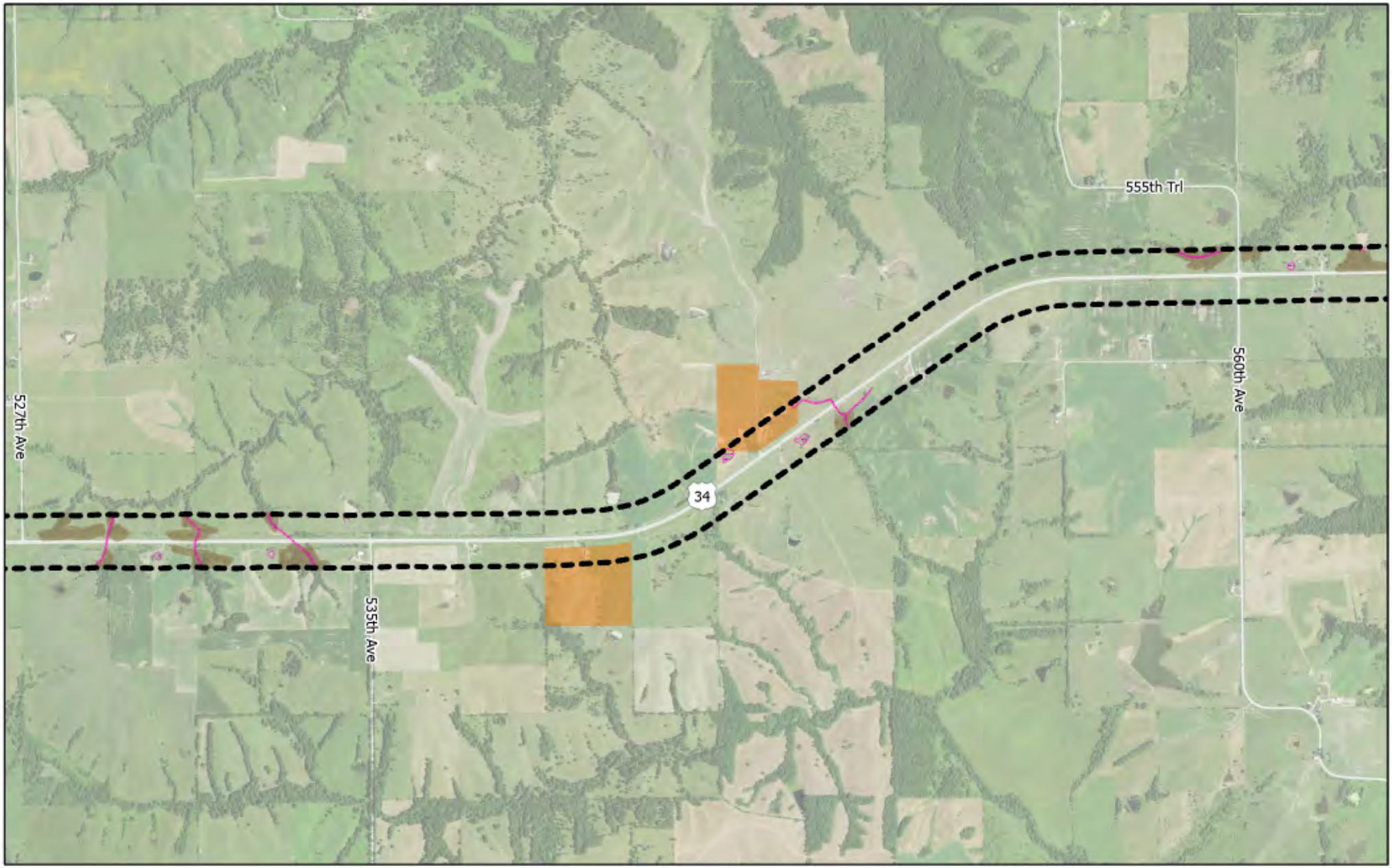

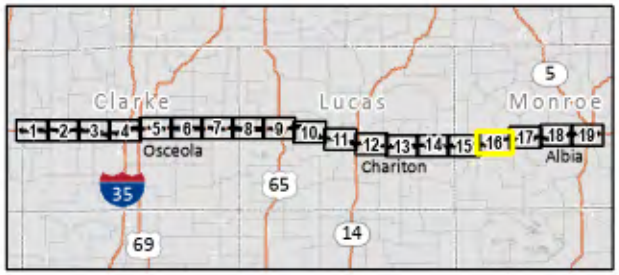

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Feet

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Environmental Constraints
US 34 Super Two Study

Jacobs

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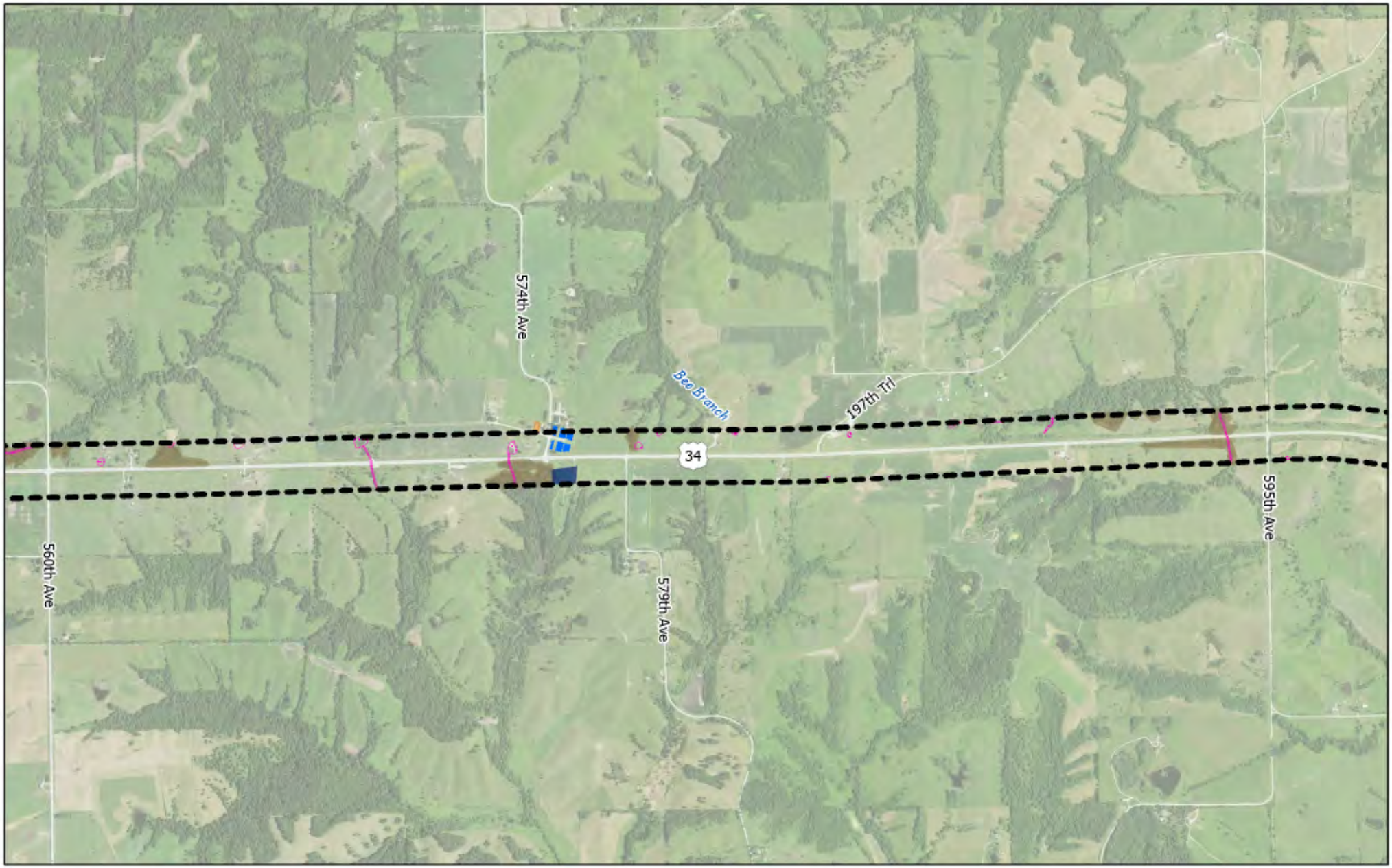

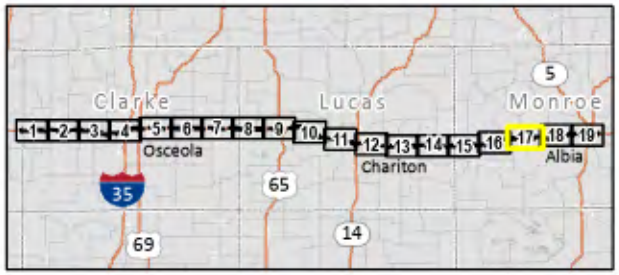

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Environmental Constraints
US 34 Super Two Study

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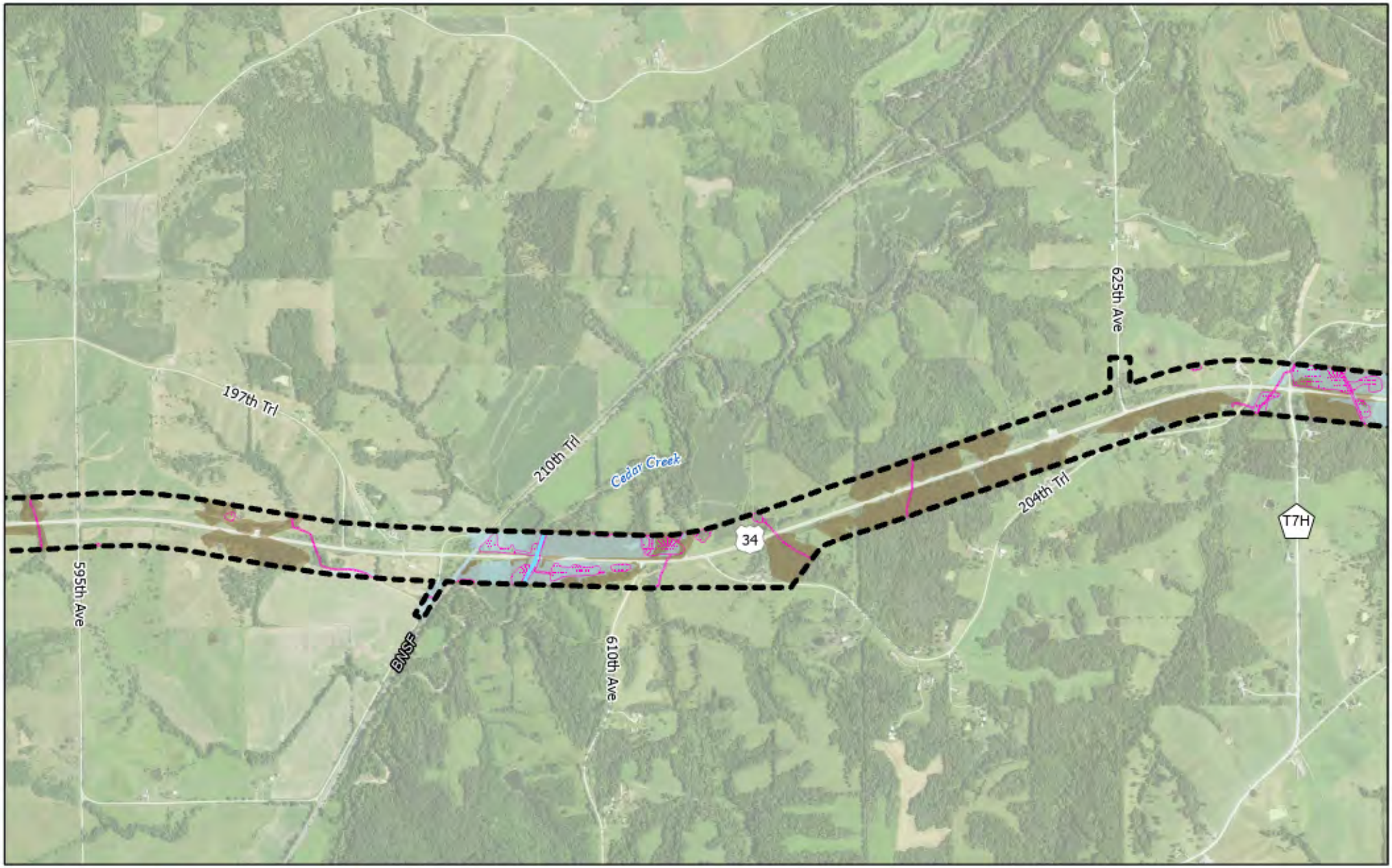

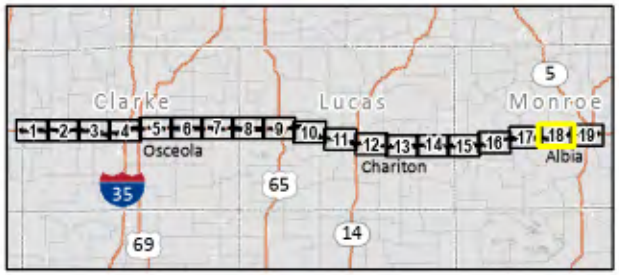

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Environmental Constraints
US 34 Super Two Study

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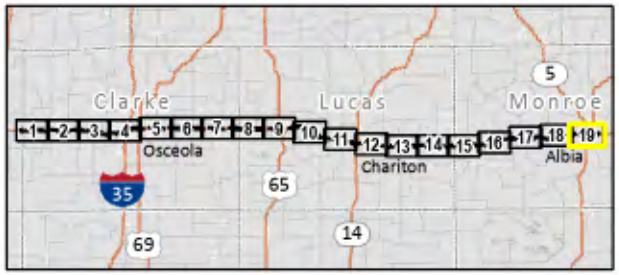

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Feet

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Environmental Constraints
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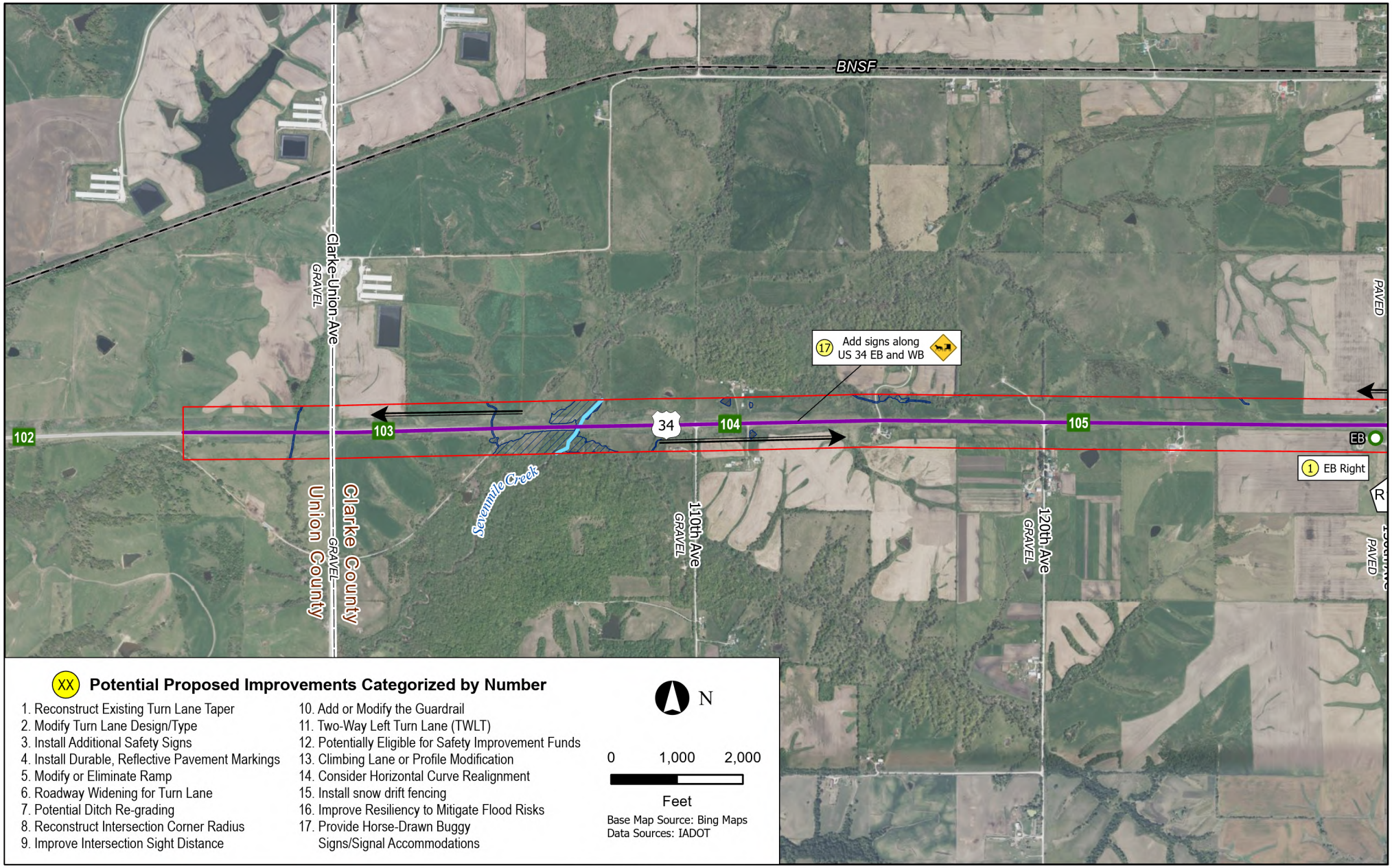
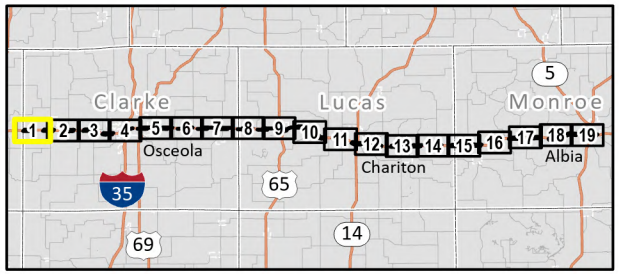
APPENDIX E – PROPOSED IMPROVEMENTS





US 34 Corridor Legend

- Study Area
- City Limits Boundary
- US 34 Mile Post
- Signalized Intersection (Existing)
- Existing Climbing/Auxiliary Lane
- Two-Way Left Turn Lane (TWLTL)
- Shoulder - 10 ft Paved
- Existing Floodplain/Wetland
- Outside Scope of Study
- Adequate Left Turn Lane
- Modified Left Turn Lane
- Proposed Left Turn Lane
- Adequate Minor/Major Right Turn Lane
- Upgrade to Major Right Turn Lane
- Proposed Minor/Major Right Turn Lane
- Proposed Improvement

Intersection Inset Legend

- Existing Lane Configuration
- Left Turn Lane
- Minor Right Turn Lane
- Major Right Turn Lane
- Signalized Intersection
- Proposed Design Element

US 34 Super Two Study
Proposed Improvements

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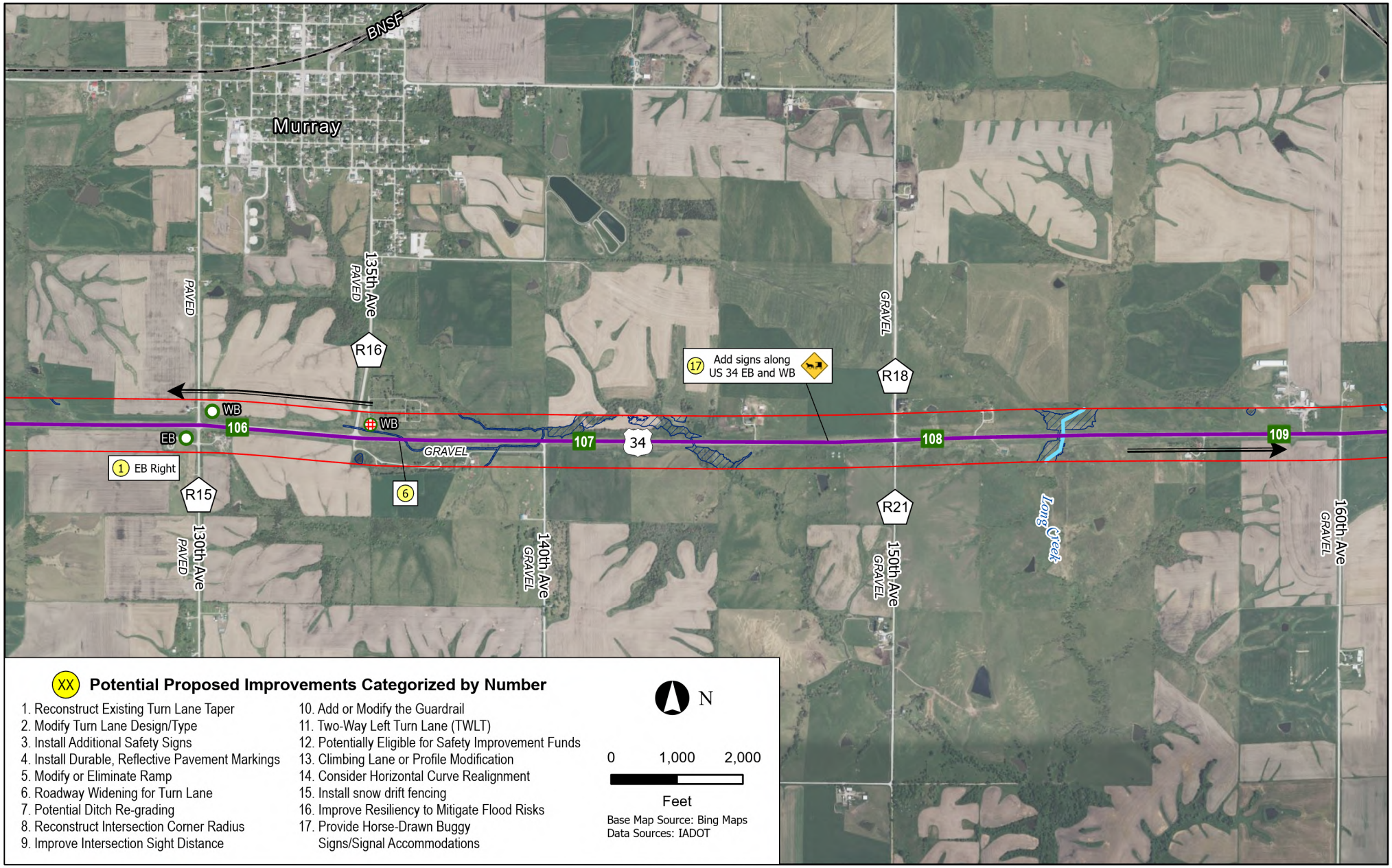

XX Potential Proposed Improvements Categorized by Number

1. Reconstruct Existing Turn Lane Taper
2. Modify Turn Lane Design/Type
3. Install Additional Safety Signs
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7. Potential Ditch Re-grading
8. Reconstruct Intersection Corner Radius
9. Improve Intersection Sight Distance
10. Add or Modify the Guardrail
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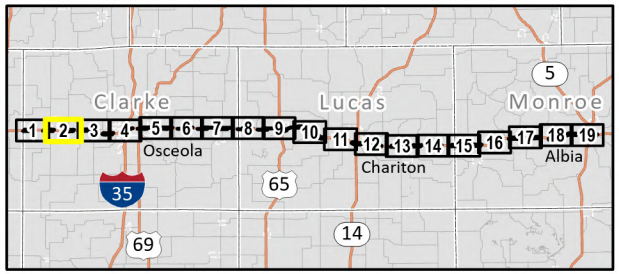
14. Consider Horizontal Curve Realignment
15. Install snow drift fencing
16. Improve Resiliency to Mitigate Flood Risks
17. Provide Horse-Drawn Buggy Signs/Signal Accommodations

N

0 1,000 2,000

Feet

Base Map Source: Bing Maps
Data Sources: IADOT



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- Upgrade to Major Right Turn Lane
- Proposed Minor/Major Right Turn Lane
- XX Proposed Improvement

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- Minor Right Turn Lane
- Major Right Turn Lane
- Signalized Intersection
- Proposed Design Element

US 34 Super Two Study
Proposed Improvements

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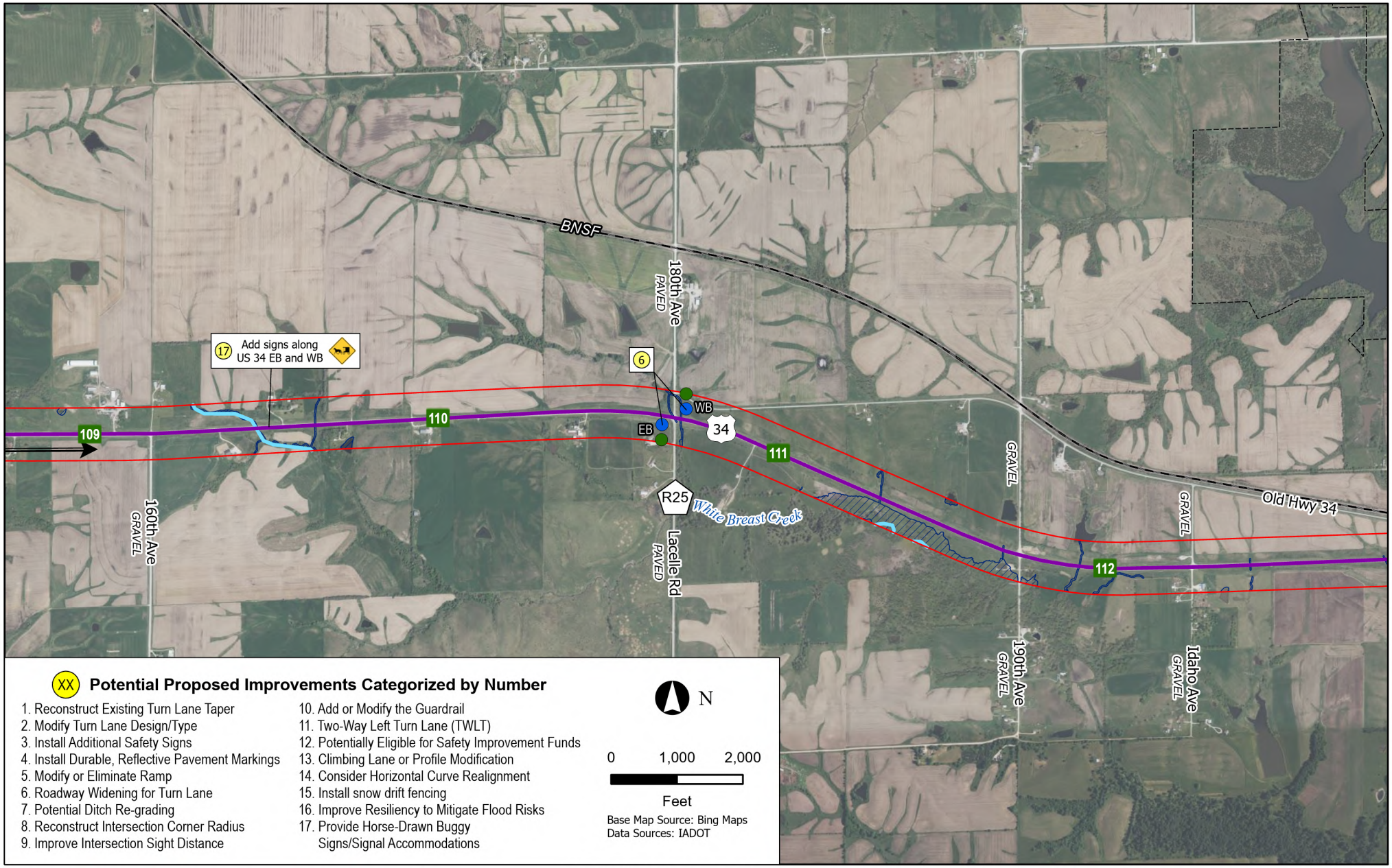

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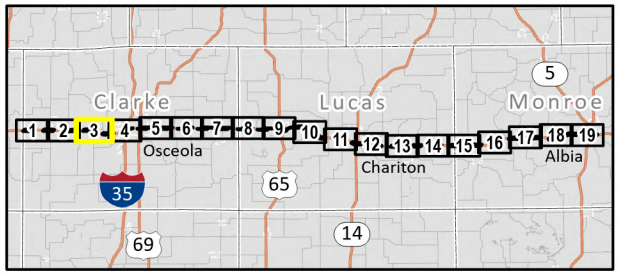
N

0 1,000 2,000

Feet

Base Map Source: Bing Maps
Data Sources: IADOT



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- Proposed Minor/Major Right Turn Lane
- Proposed Improvement

Intersection Inset Legend

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- Left Turn Lane
- Minor Right Turn Lane
- Major Right Turn Lane
- Signalized Intersection
- Proposed Design Element

US 34 Super Two Study
Proposed Improvements

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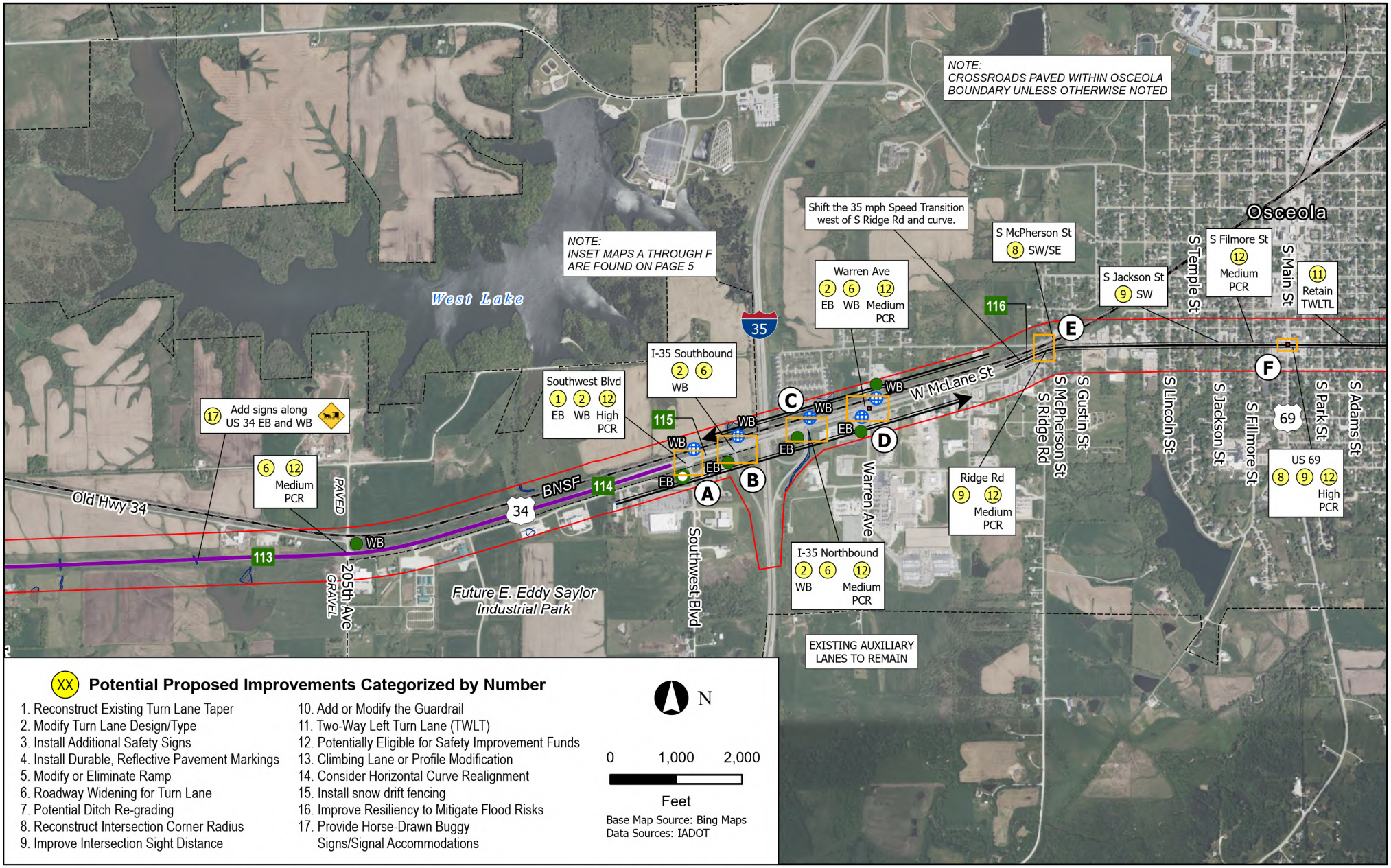
December 20, 2023



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N

0 1,000 2,000

Feet

Base Map Source: Bing Maps
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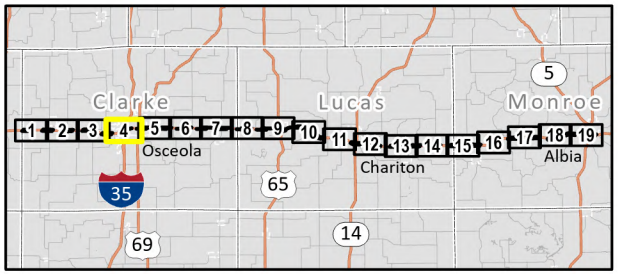

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- Upgrade to Major Right Turn Lane
- Proposed Minor/Major Right Turn Lane
- Proposed Improvement

Intersection Inset Legend

- Existing Lane Configuration
- Left Turn Lane
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- Proposed Design Element

US 34 Super Two Study
Proposed Improvements

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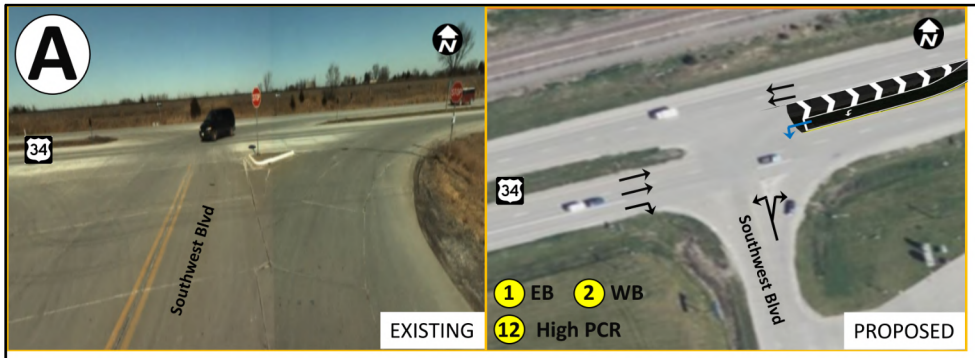
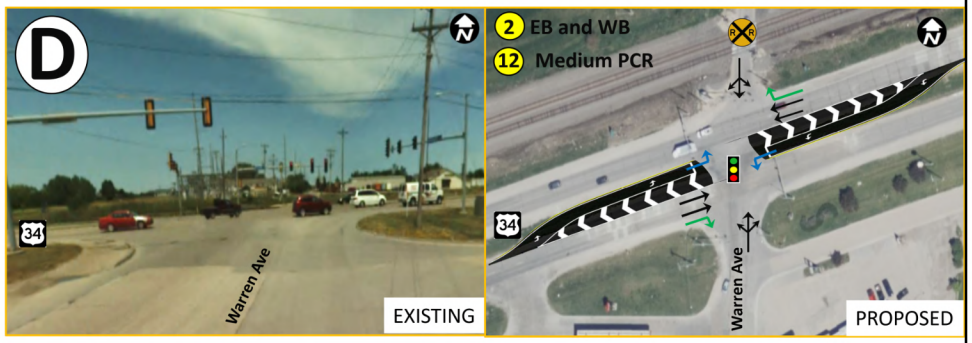
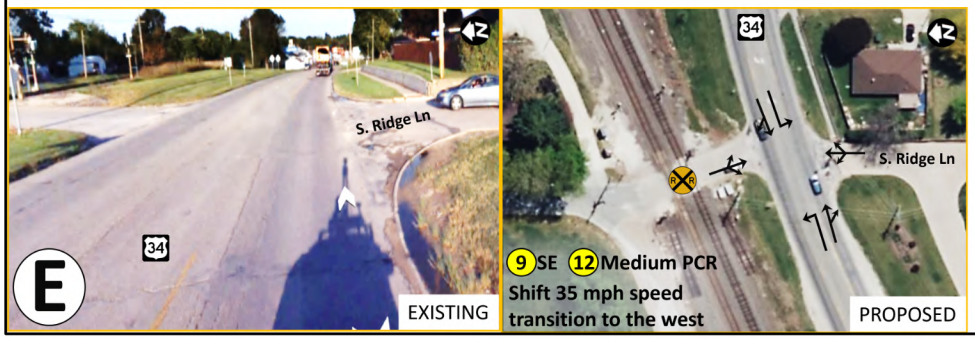
December 20, 2023







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Intersection Inset Legend

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US 34 Super Two Study
Proposed Improvements

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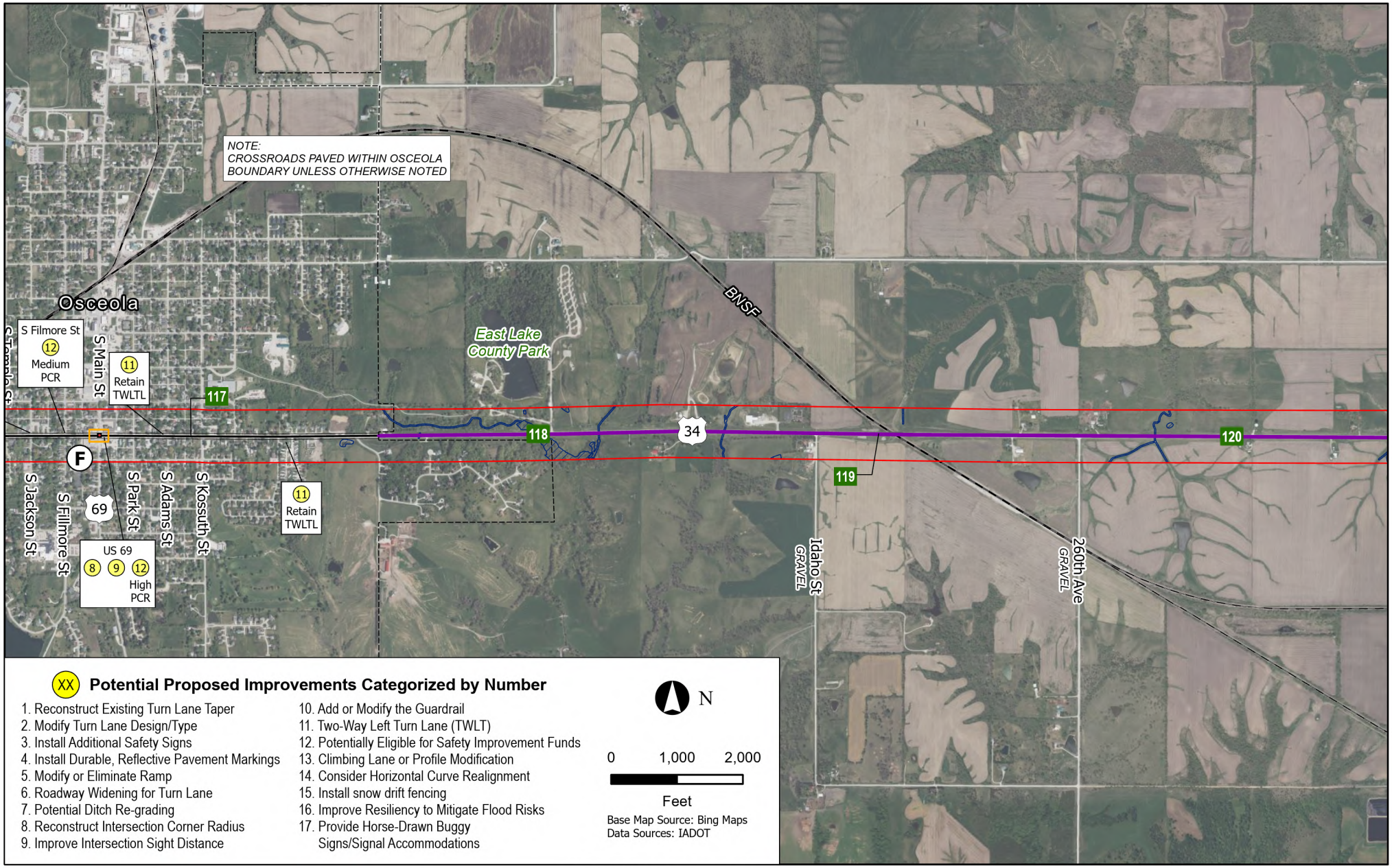

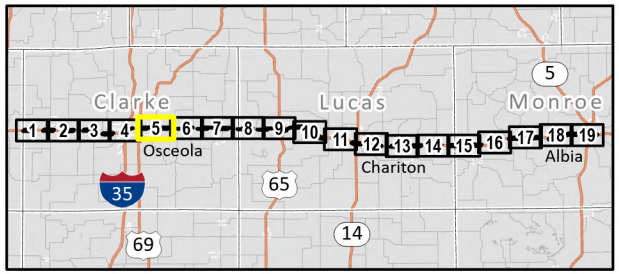

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US 34 Super Two Study
Proposed Improvements

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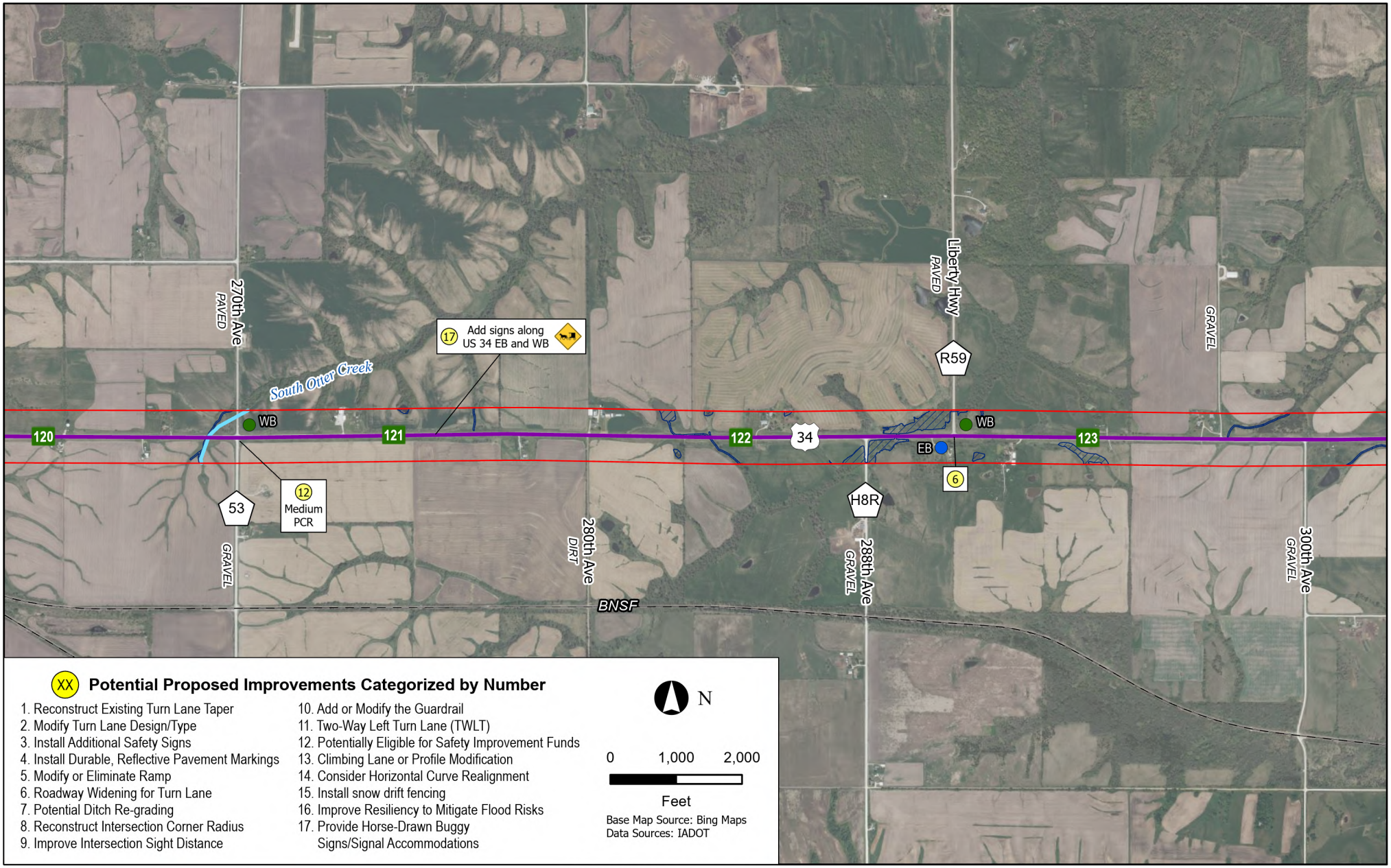

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N

0 1,000 2,000

Feet

Base Map Source: Bing Maps
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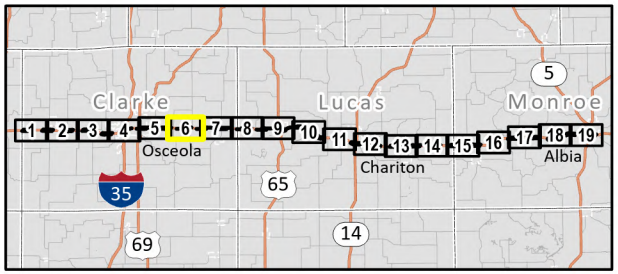

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US 34 Super Two Study
Proposed Improvements

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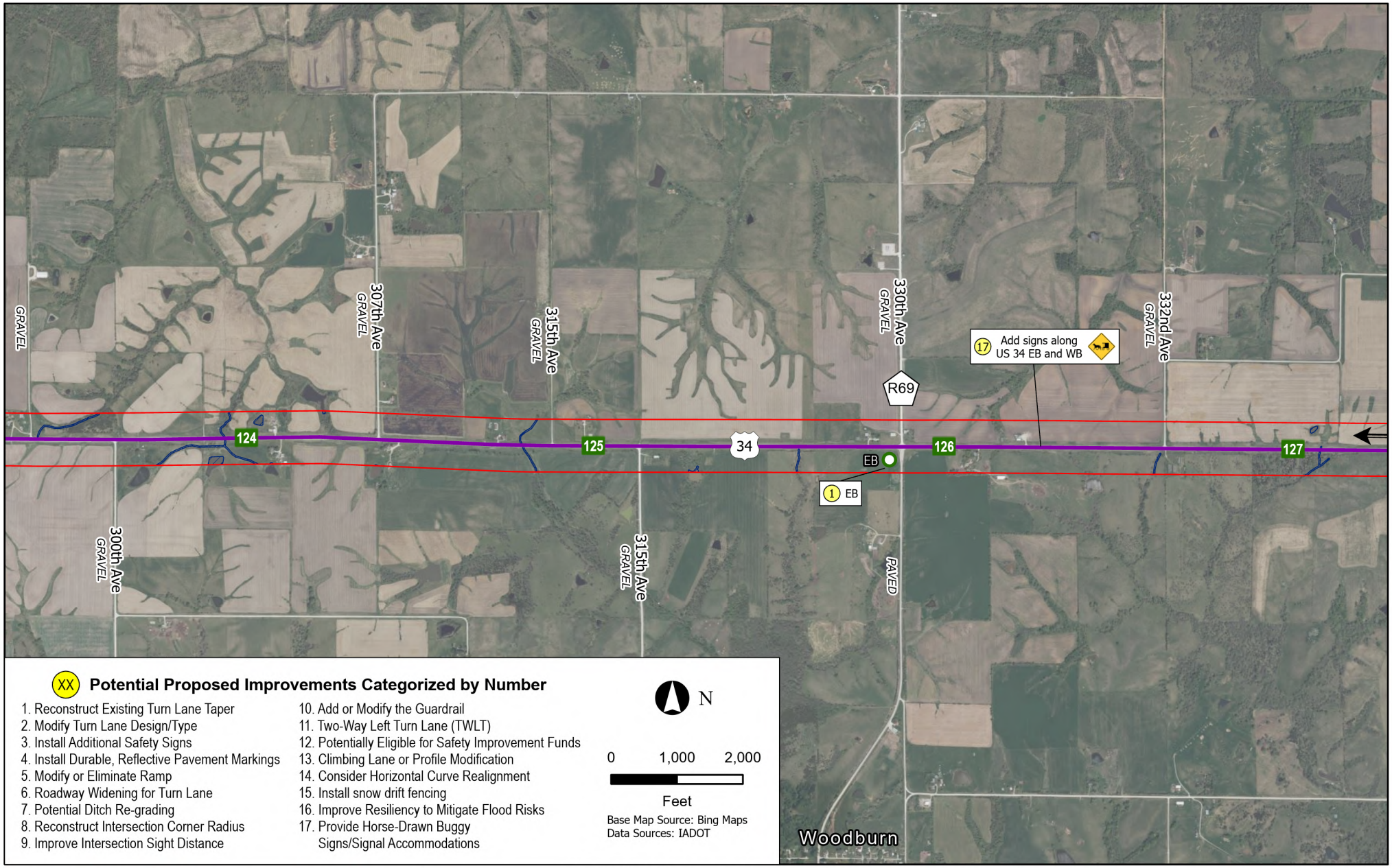

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Feet

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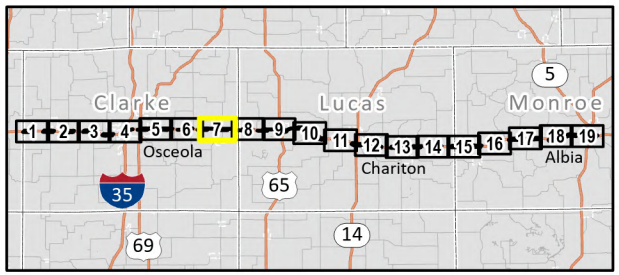

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Intersection Inset Legend

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- Left Turn Lane
- Minor Right Turn Lane
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- Signalized Intersection
- Proposed Design Element

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Proposed Improvements

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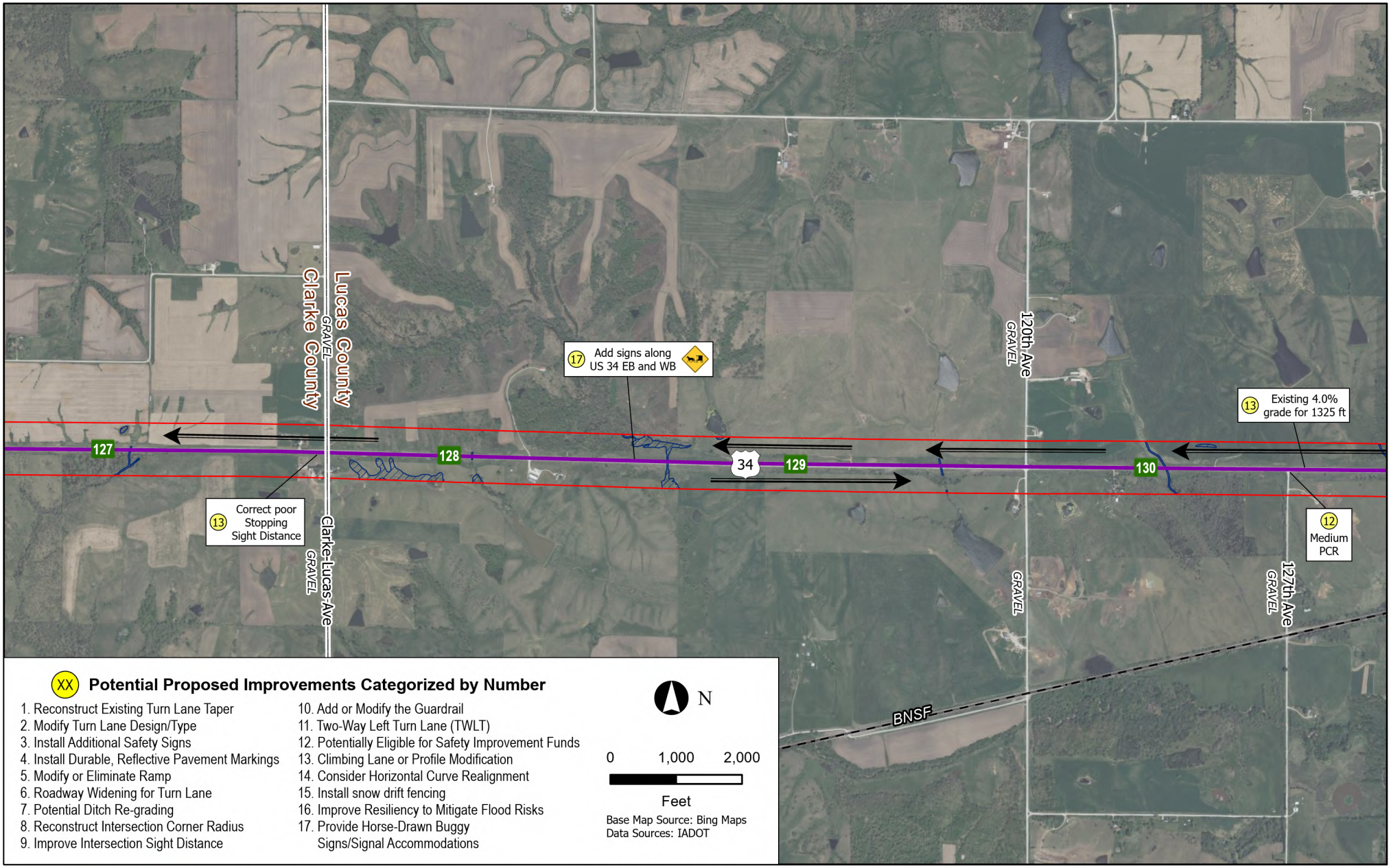

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0 1,000 2,000

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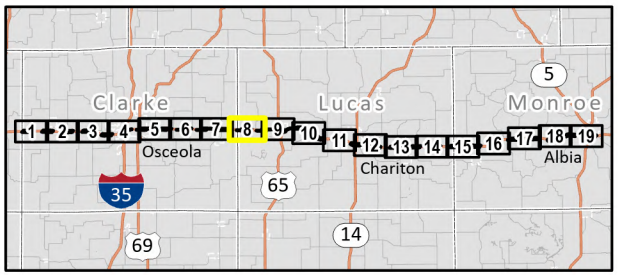

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- Existing Climbing/Auxiliary Lane
- Two-Way Left Turn Lane (TWLTL)
- Shoulder - 10 ft Paved
- Existing Floodplain/Wetland
- Outside Scope of Study
- Adequate Left Turn Lane
- Modified Left Turn Lane
- Proposed Left Turn Lane
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- Upgrade to Major Right Turn Lane
- Proposed Minor/Major Right Turn Lane
- XX Proposed Improvement

Intersection Inset Legend

- Existing Lane Configuration
- Left Turn Lane
- Minor Right Turn Lane
- Major Right Turn Lane
- Signalized Intersection
- Proposed Design Element

US 34 Super Two Study
Proposed Improvements

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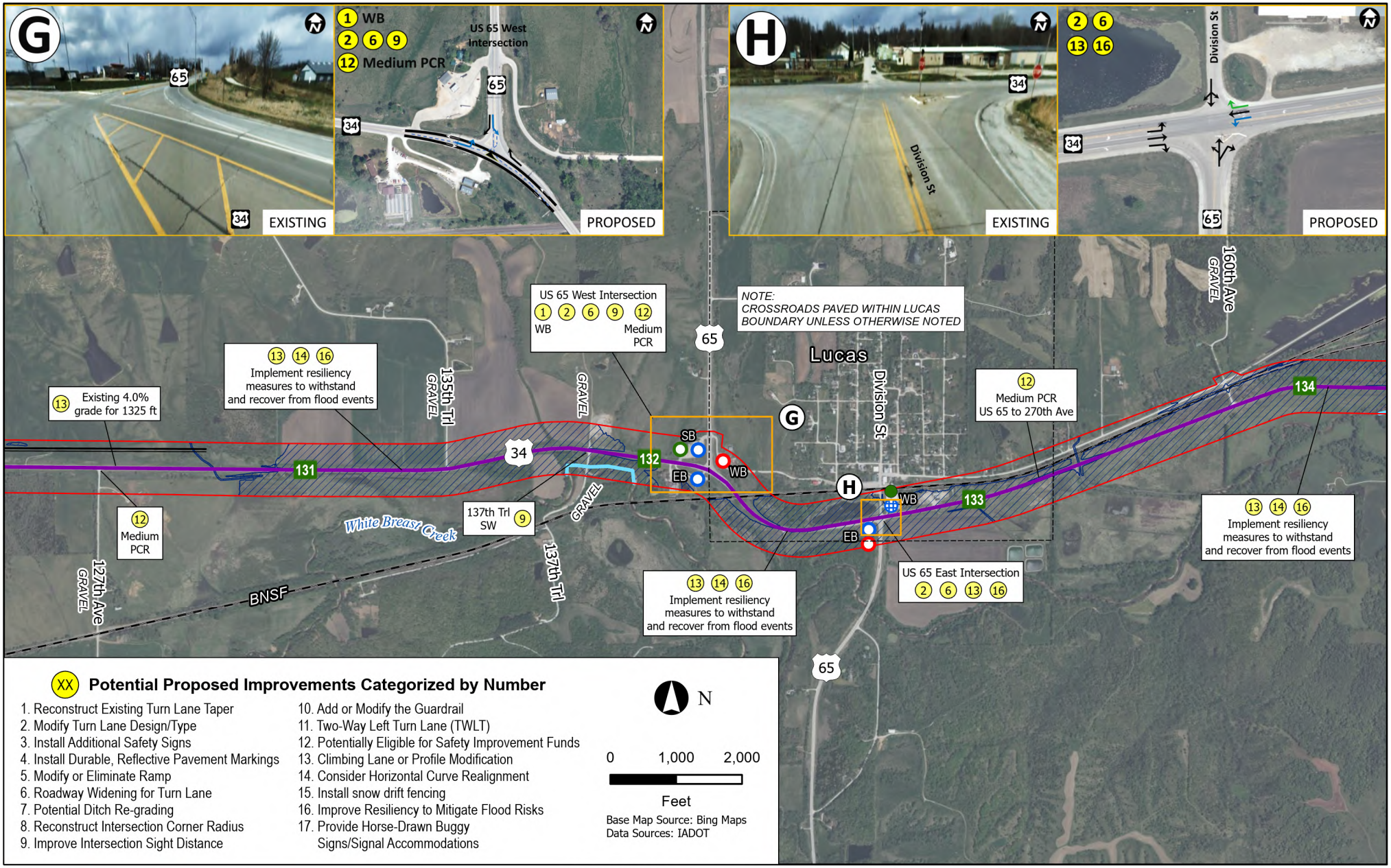
December 20, 2023



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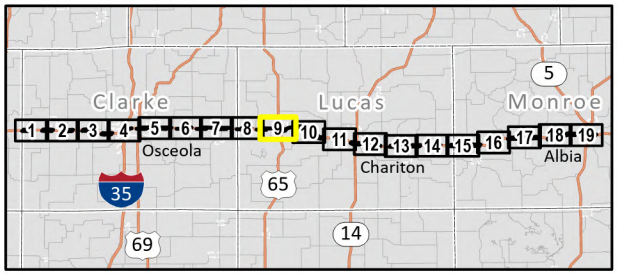
14. Consider Horizontal Curve Realignment
15. Install snow drift fencing
16. Improve Resiliency to Mitigate Flood Risks
17. Provide Horse-Drawn Buggy Signs/Signal Accommodations

N

0 1,000 2,000

Feet

Base Map Source: Bing Maps
Data Sources: IADOT



US 34 Corridor Legend

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- City Limits Boundary
- US 34 Mile Post
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US 34 Super Two Study
Proposed Improvements

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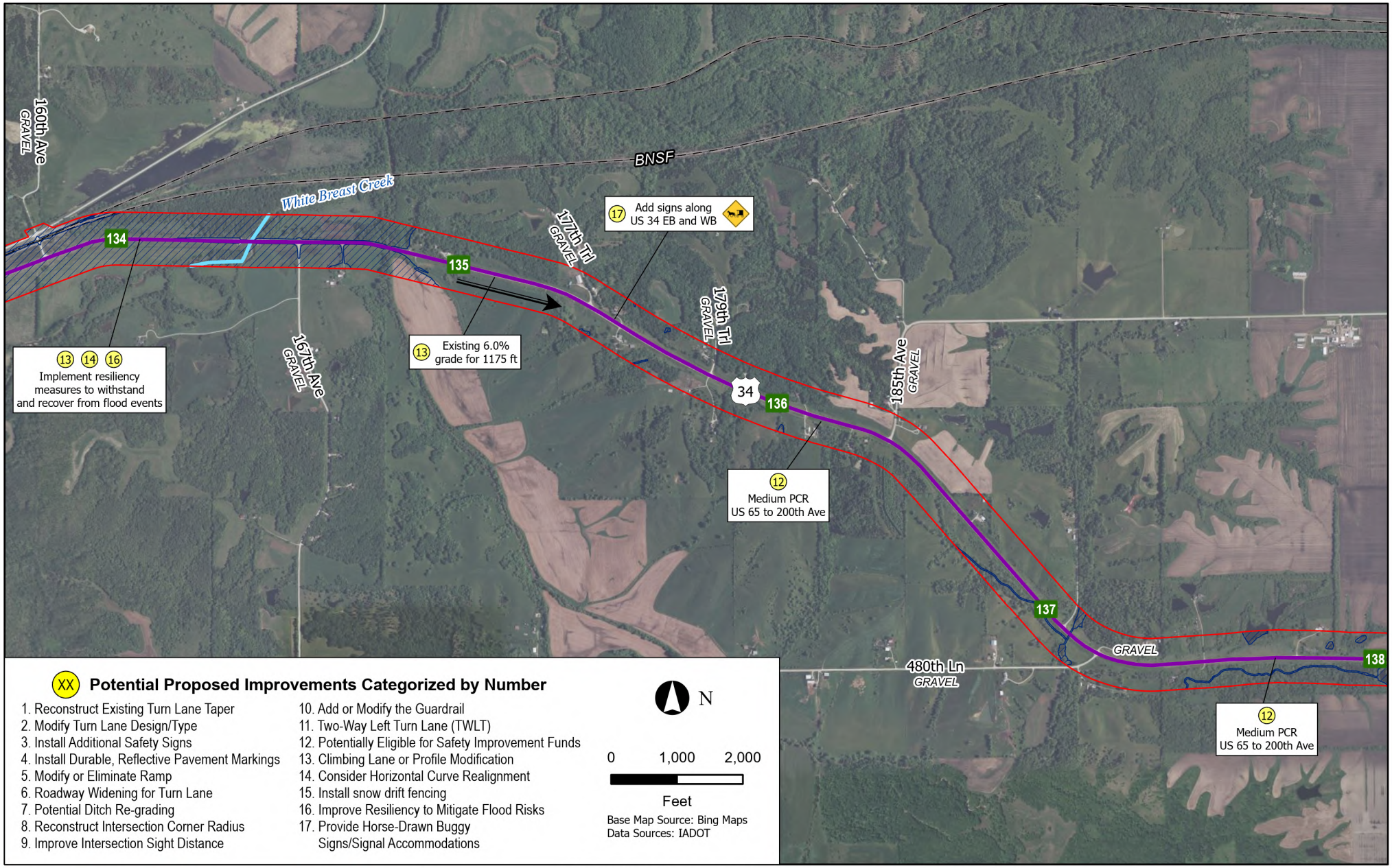

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N

0 1,000 2,000

Feet

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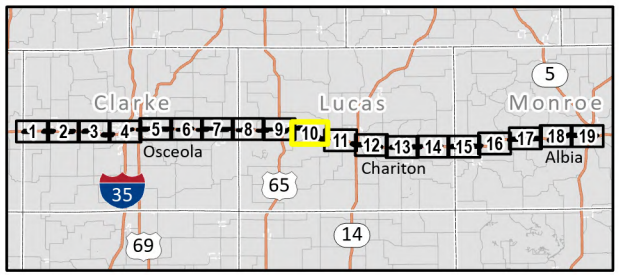
Data Sources: IADOT



US 34 Corridor Legend

- Study Area
- City Limits Boundary
- US 34 Mile Post
- Signalized Intersection (Existing)
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- Proposed Design Element

US 34 Super Two Study
Proposed Improvements

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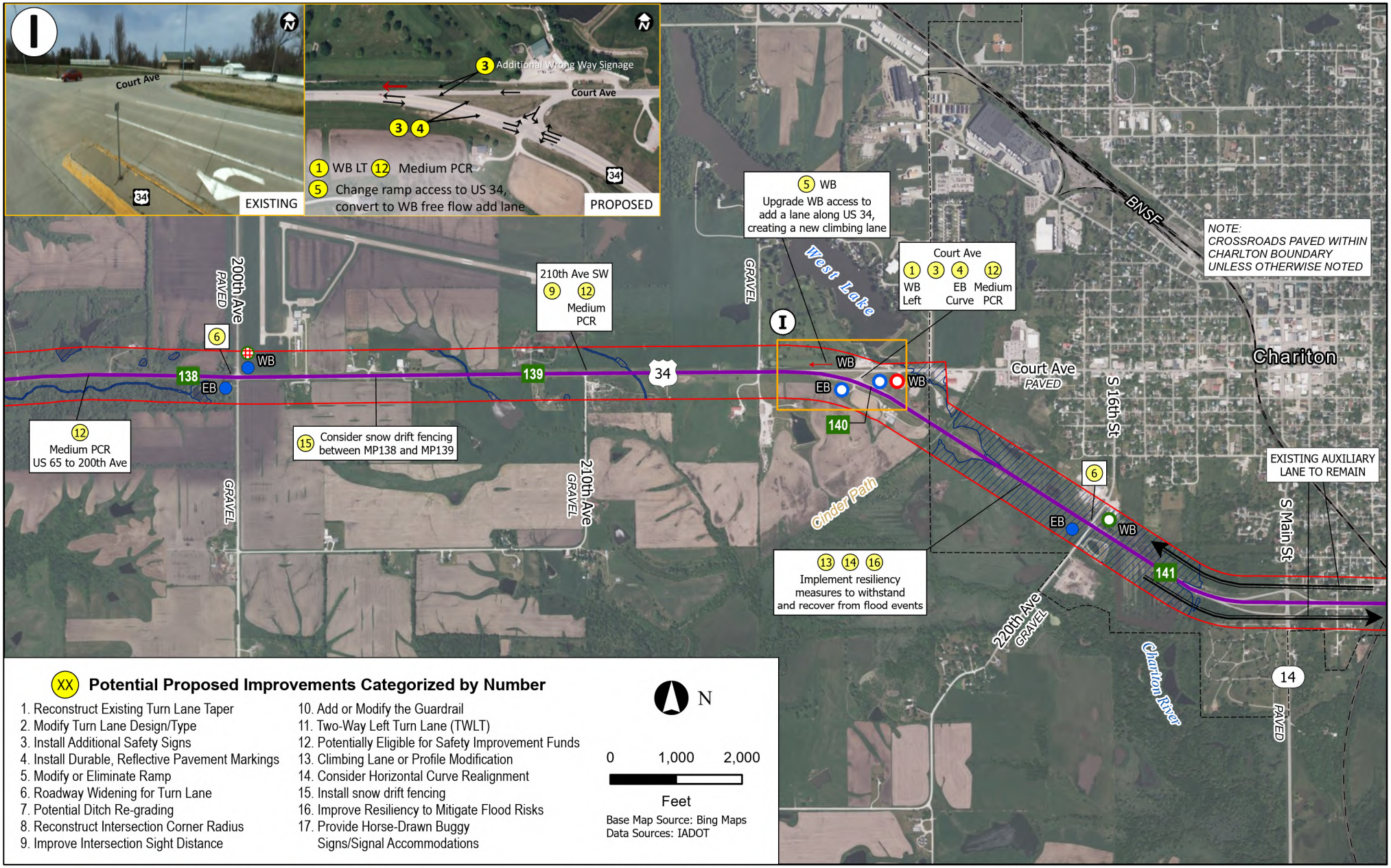
December 20, 2023



US 34 Super Two Study
Proposed Improvements

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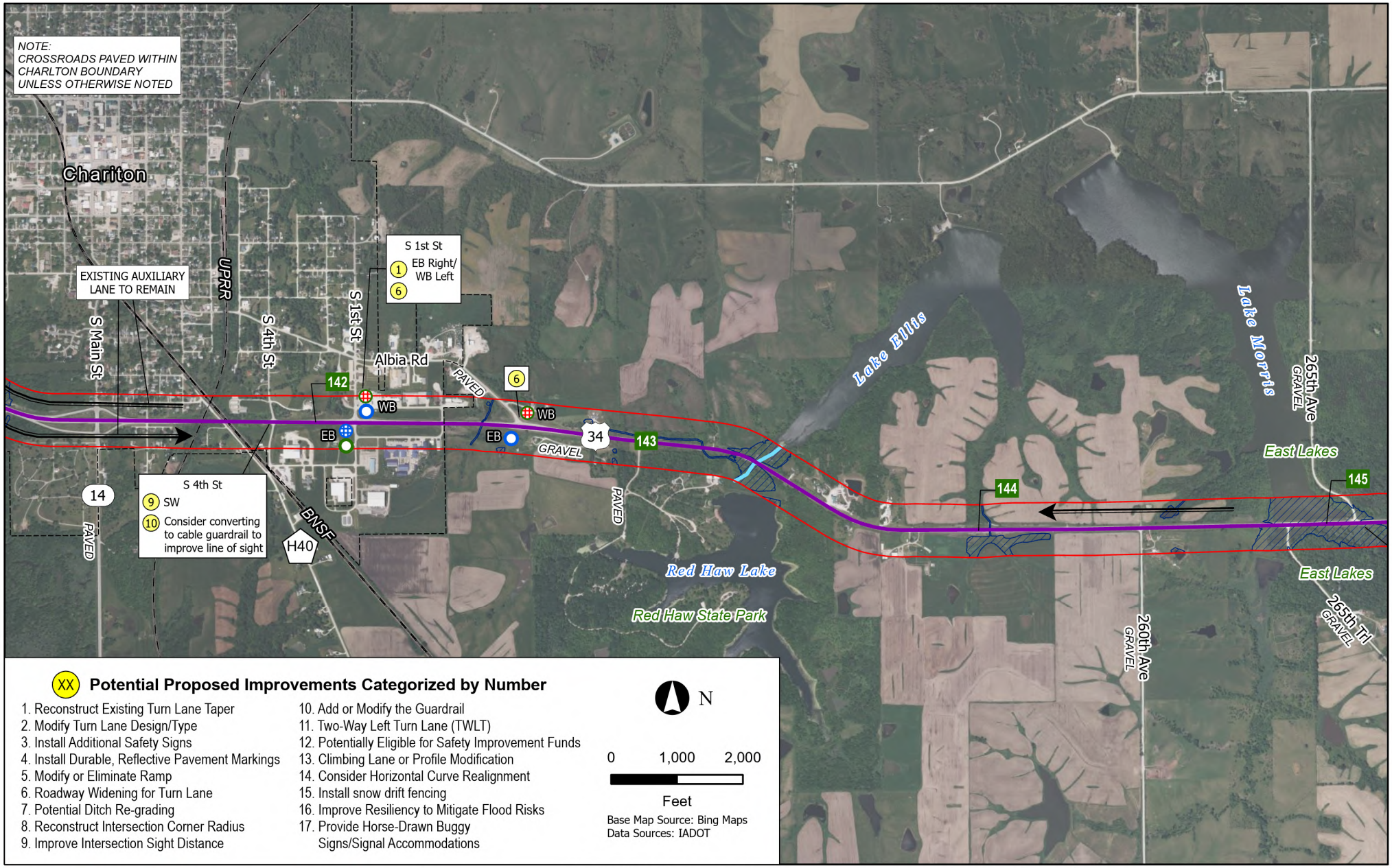
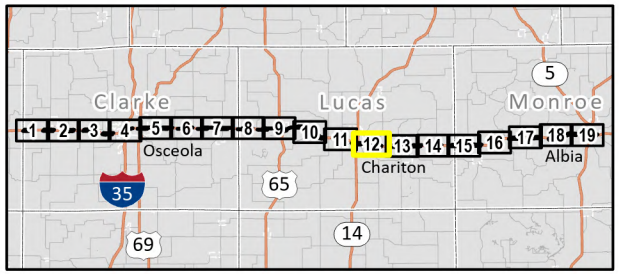
December 20, 2023





US 34 Corridor Legend

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- Major Right Turn Lane
- Signalized Intersection
- Proposed Design Element

US 34 Super Two Study
Proposed Improvements

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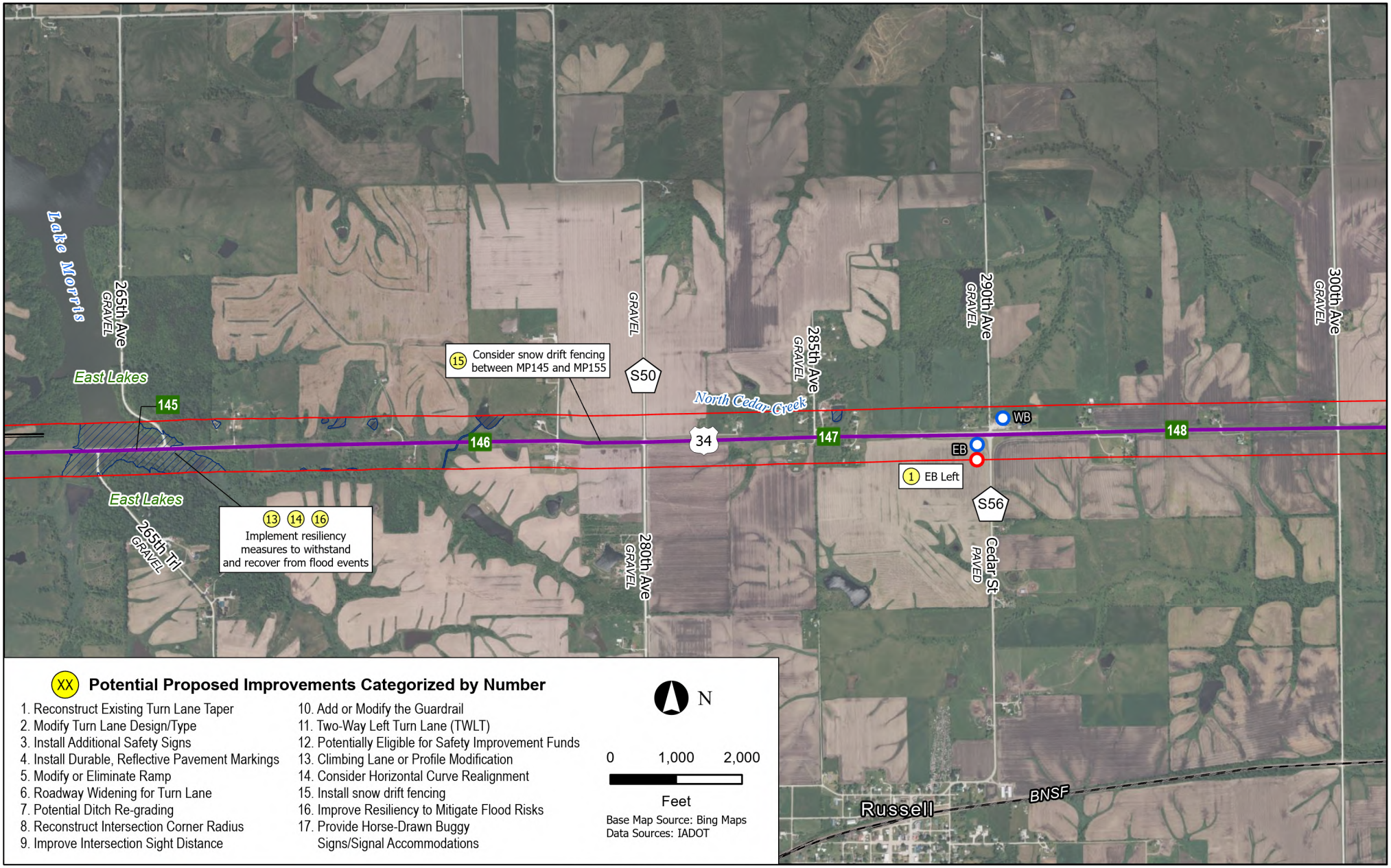
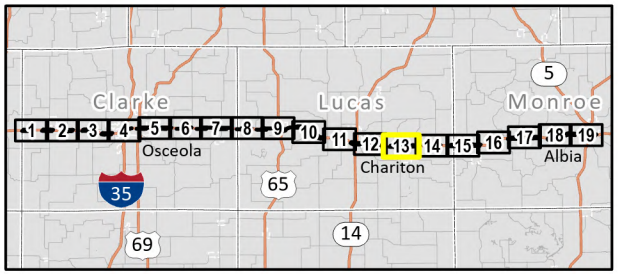
December 20, 2023





US 34 Corridor Legend

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US 34 Super Two Study
Proposed Improvements

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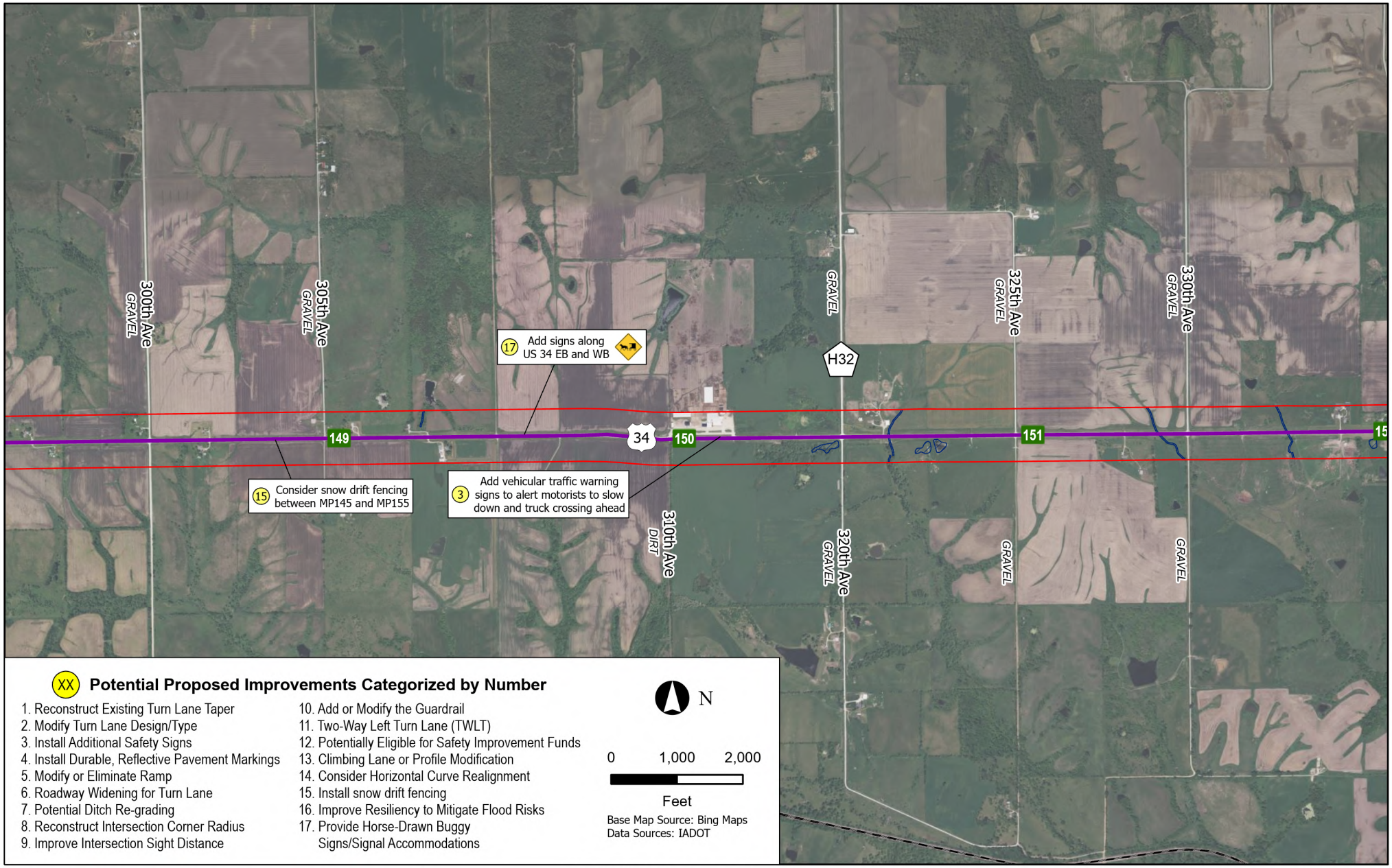
December 20, 2023



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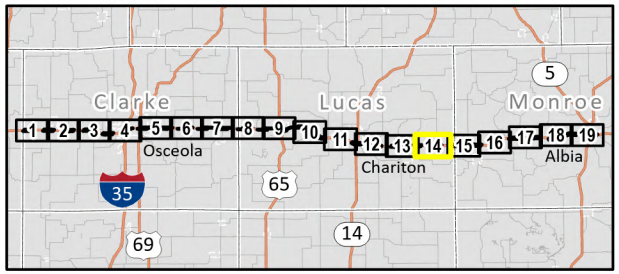
N

0 1,000 2,000

Feet

Base Map Source: Bing Maps
Data Sources: IADOT



US 34 Corridor Legend

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US 34 Super Two Study
Proposed Improvements

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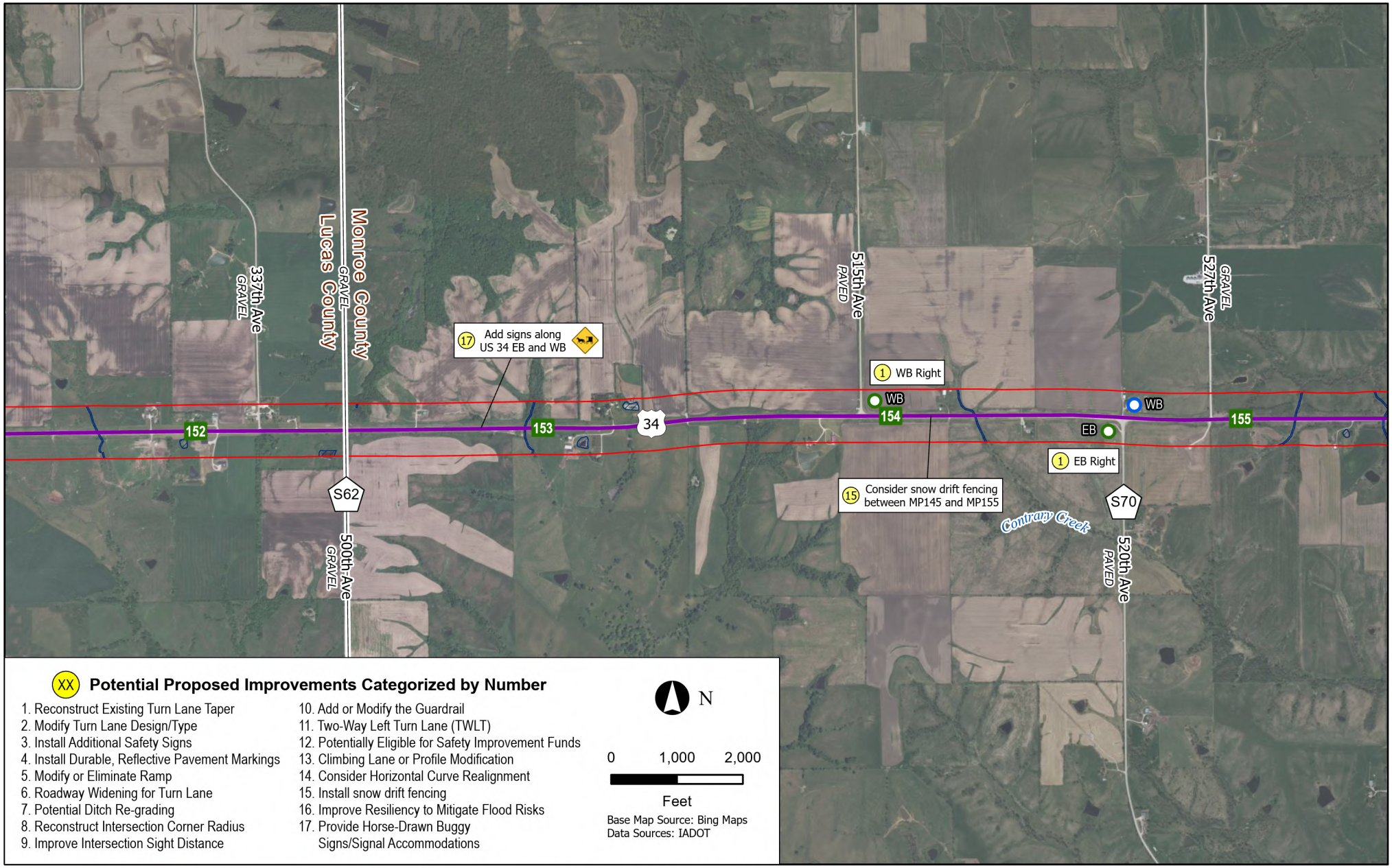

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N

0 1,000 2,000

Feet

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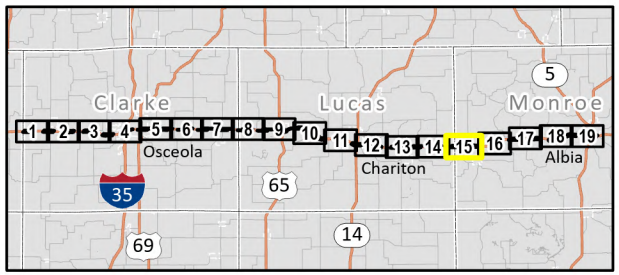

US 34 Corridor Legend

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US 34 Super Two Study
Proposed Improvements

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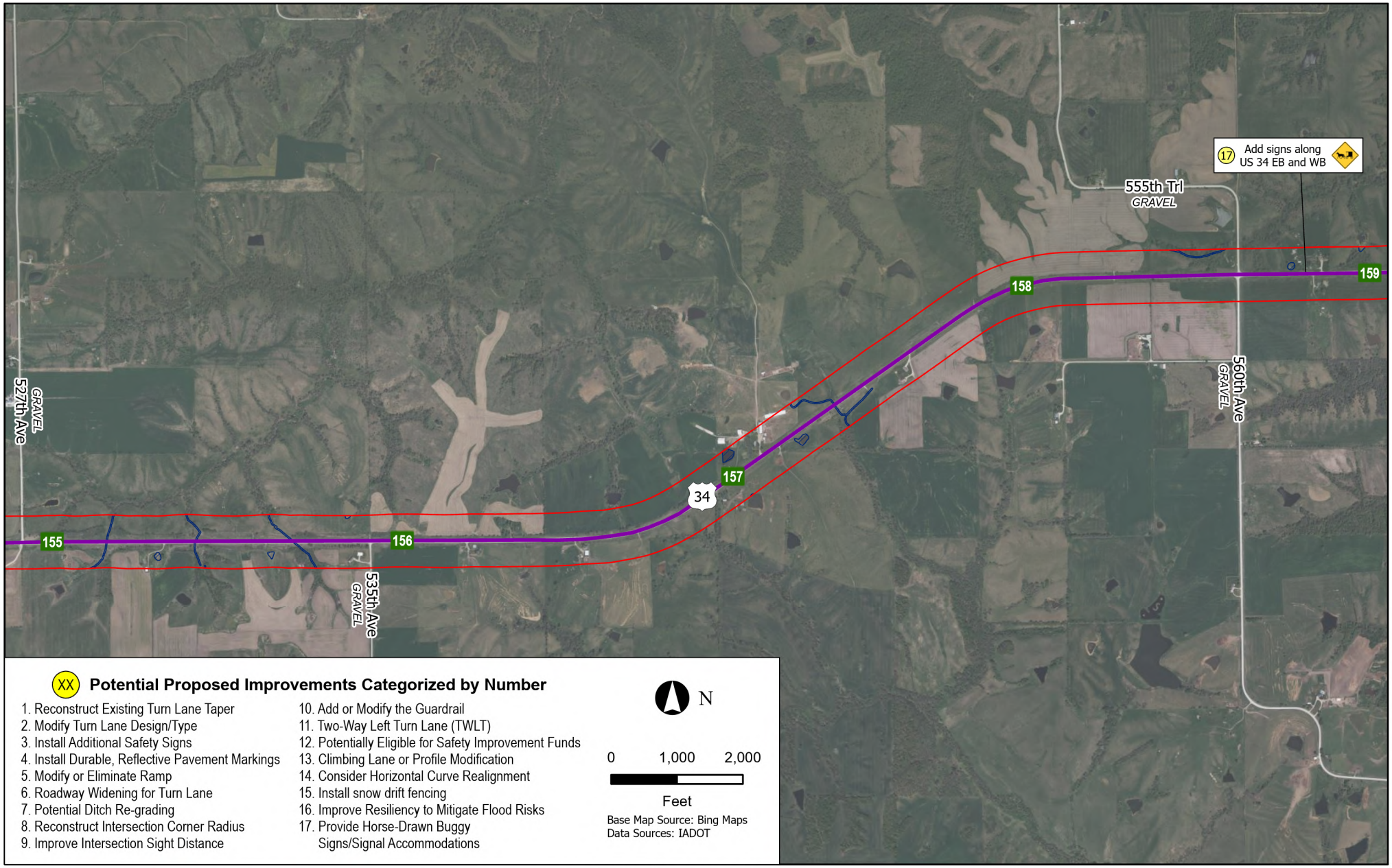

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N

0 1,000 2,000

Feet

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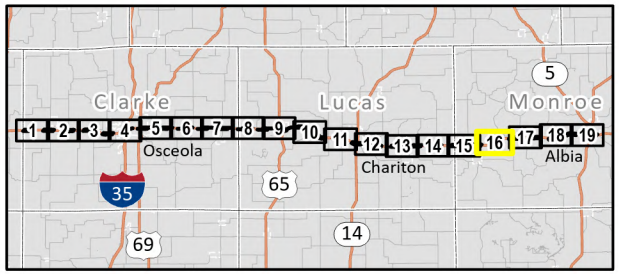

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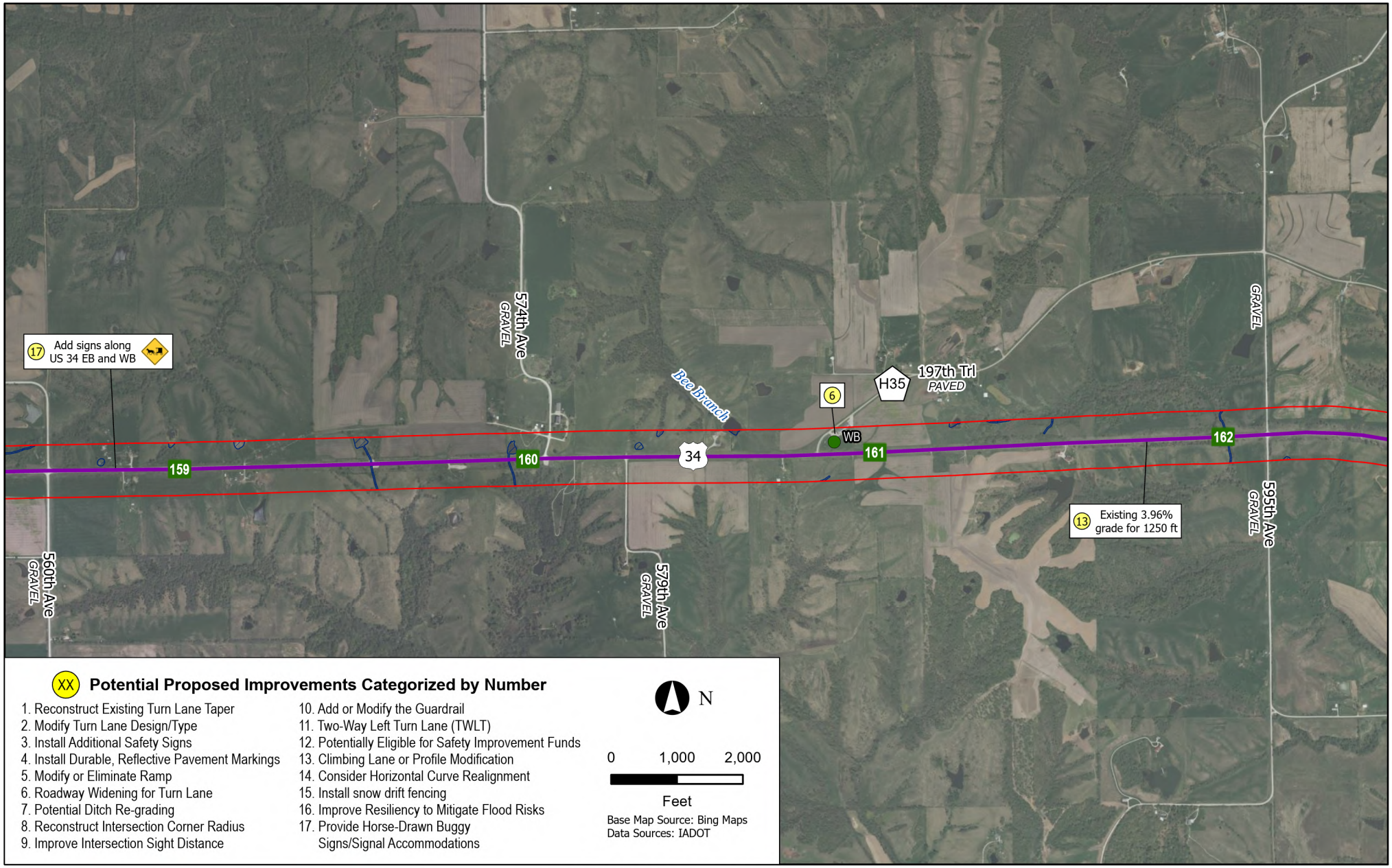
US 34 Super Two Study
Proposed Improvements

Jacobs

IOWA DOT

December 20, 2023



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N

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Feet

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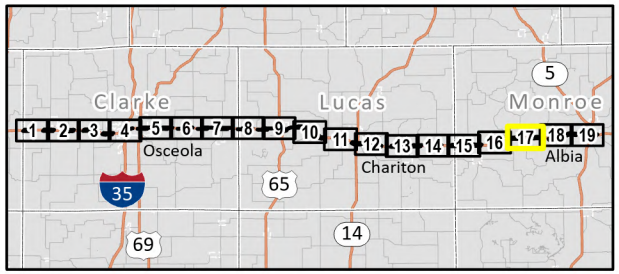

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US 34 Super Two Study
Proposed Improvements

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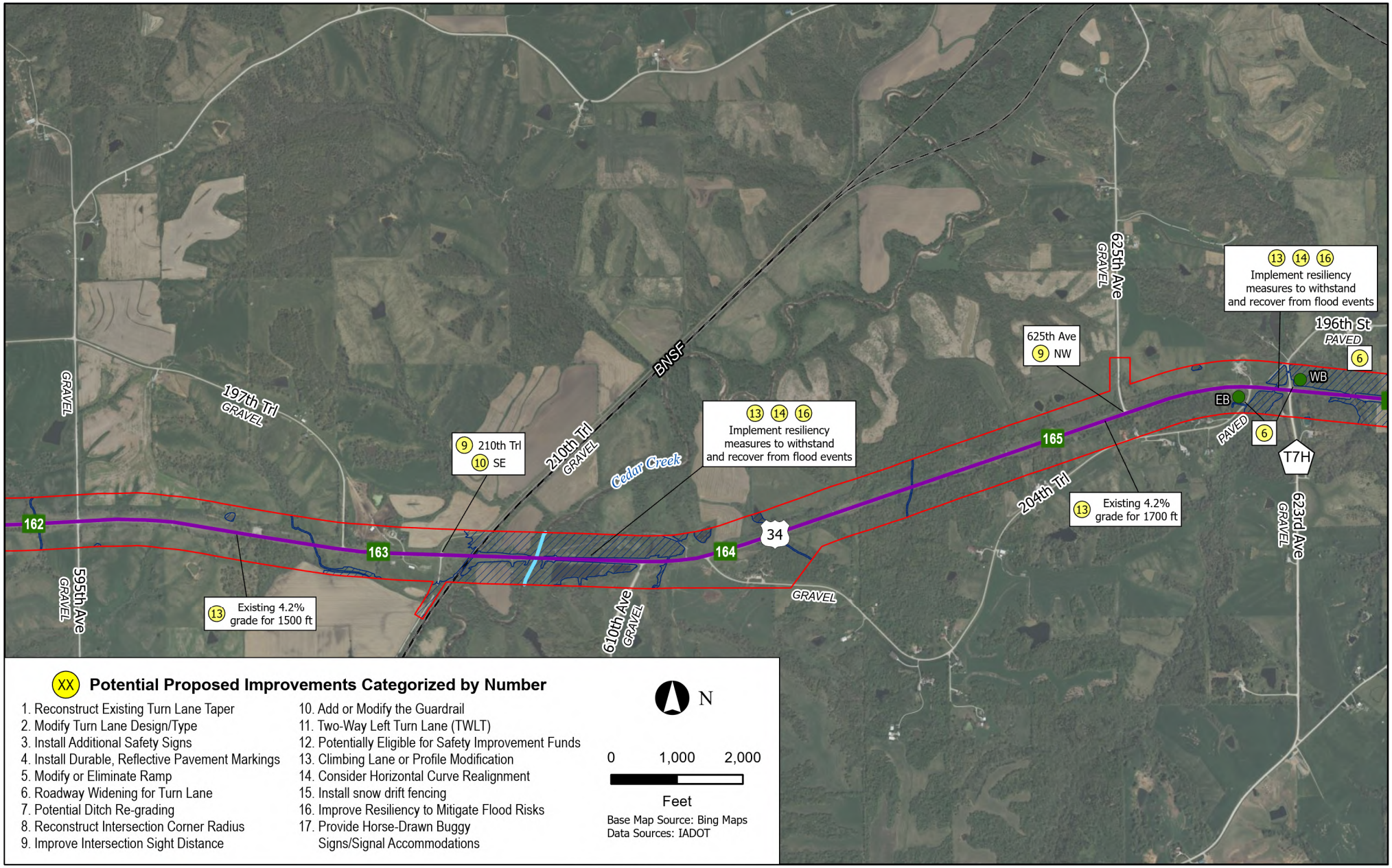

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0 1,000 2,000

Feet

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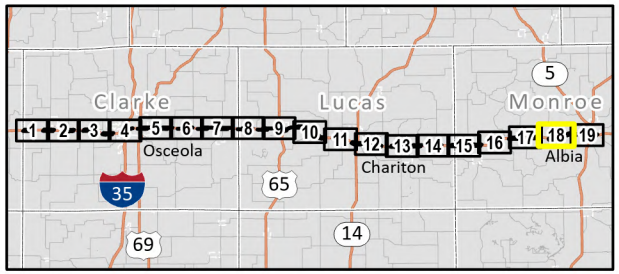

US 34 Corridor Legend

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US 34 Super Two Study
Proposed Improvements

Jacobs

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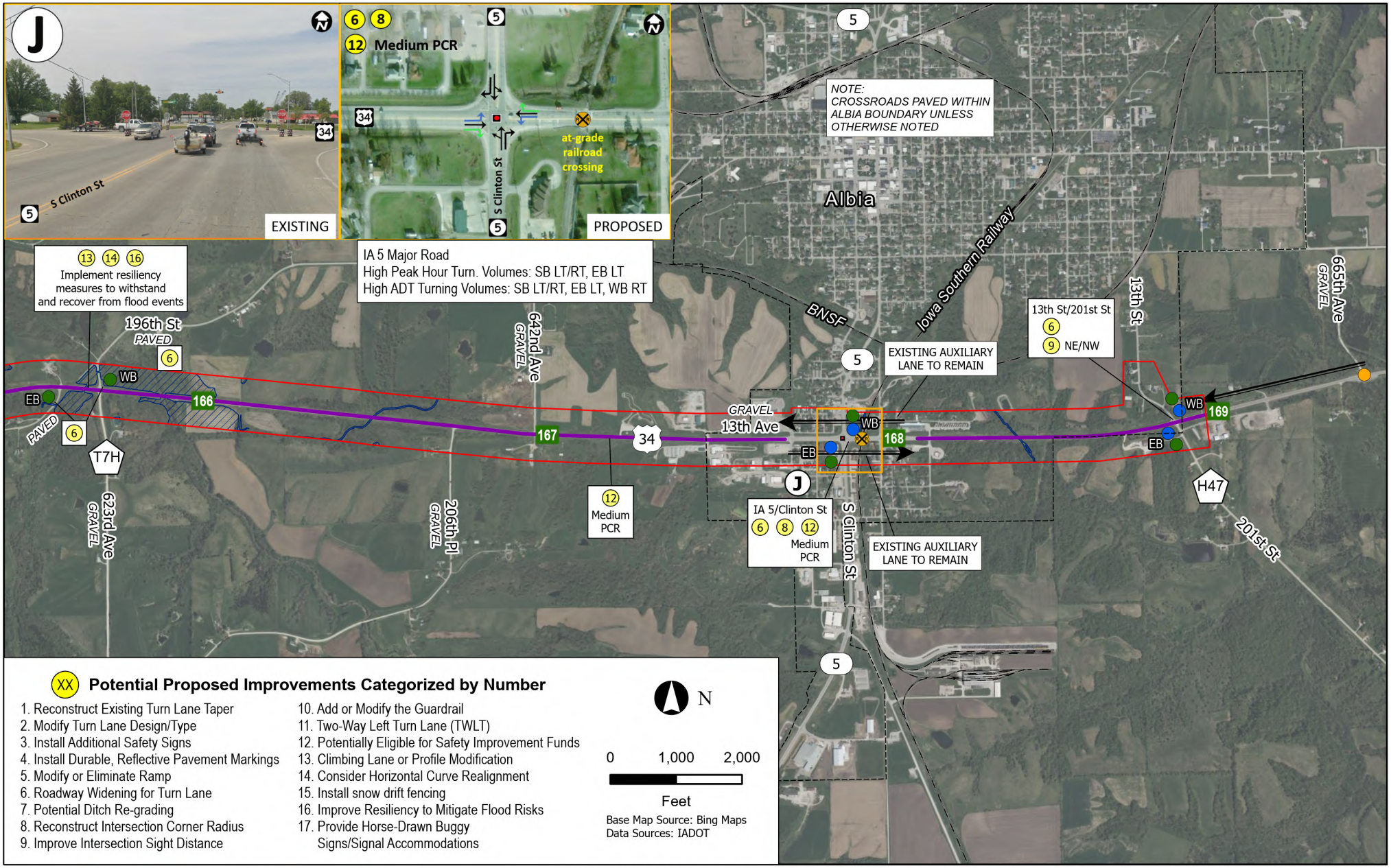

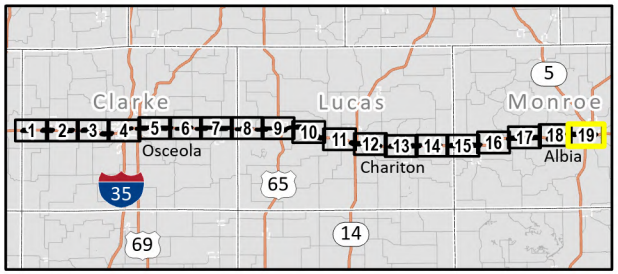

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US 34 Super Two Study
Proposed Improvements

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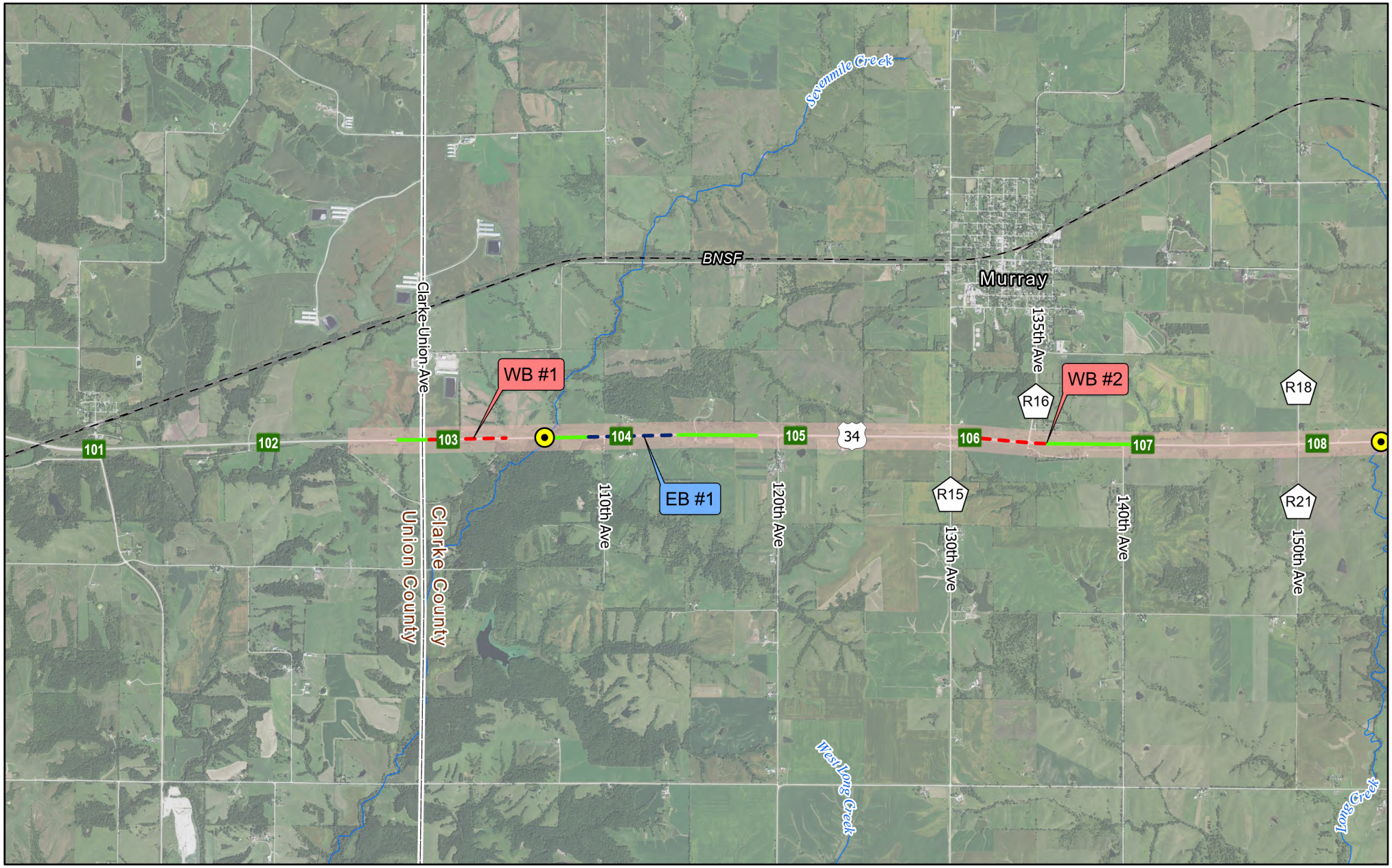
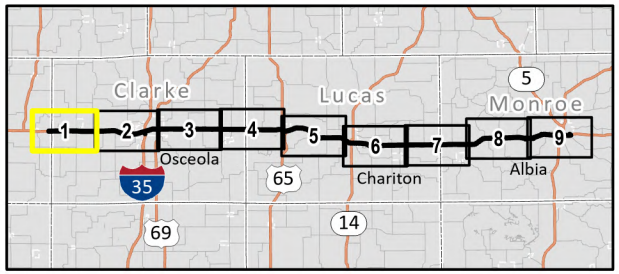
APPENDIX F – PROPOSED PASSING/CLIMBING LANE LOCATIONS





US 34 Corridor Legend

- Study Area
- Stream
- US 34 Mile Post
- Existing Bridge
- Existing Multiple Barrel Reinforced Concrete Box Culvert
- Existing Climbing Lane (EB)
- Existing Climbing Lane (WB)
- Proposed Passing Lane (EB)
- Proposed Passing Lane (WB)
- Extension of Climbing Lane into Passing Lane (WB and EB)

N

0 2,000 4,000

Feet

Base Map Source: NAIP
Data Sources: IADOT

US 34 Super Two Study
Proposed Passing Lanes

Jacobs

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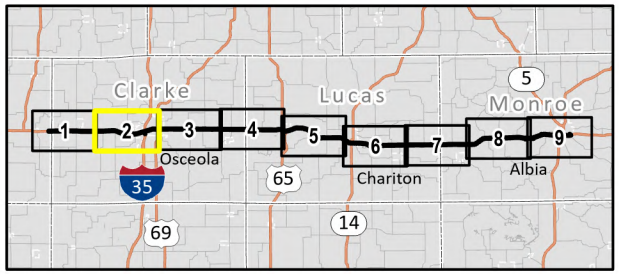
December 21, 2023



US 34 Corridor Legend

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- Stream
- US 34 Mile Post
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- Existing Multiple Barrel Reinforced Concrete Box Culvert
- Existing Climbing Lane (EB)
- Existing Climbing Lane (WB)
- Proposed Passing Lane (EB)
- Proposed Passing Lane (WB)
- Extension of Climbing Lane into Passing Lane (WB and EB)

N

0 2,000 4,000

Feet

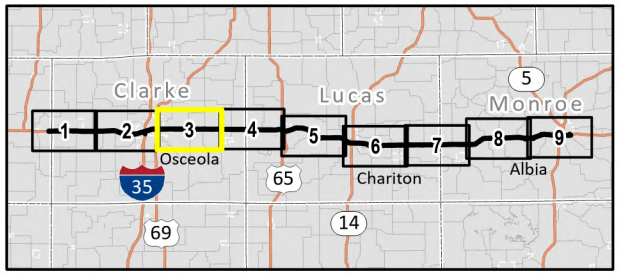
Base Map Source: NAIP
Data Sources: IADOT

US 34 Super Two Study
Proposed Passing Lanes

Jacobs

IOWA DOT

December 21, 2023



US 34 Corridor Legend

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- Existing Climbing Lane (EB)
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- Proposed Passing Lane (WB)
- Extension of Climbing Lane into Passing Lane (WB and EB)

N

0 2,000 4,000

Feet

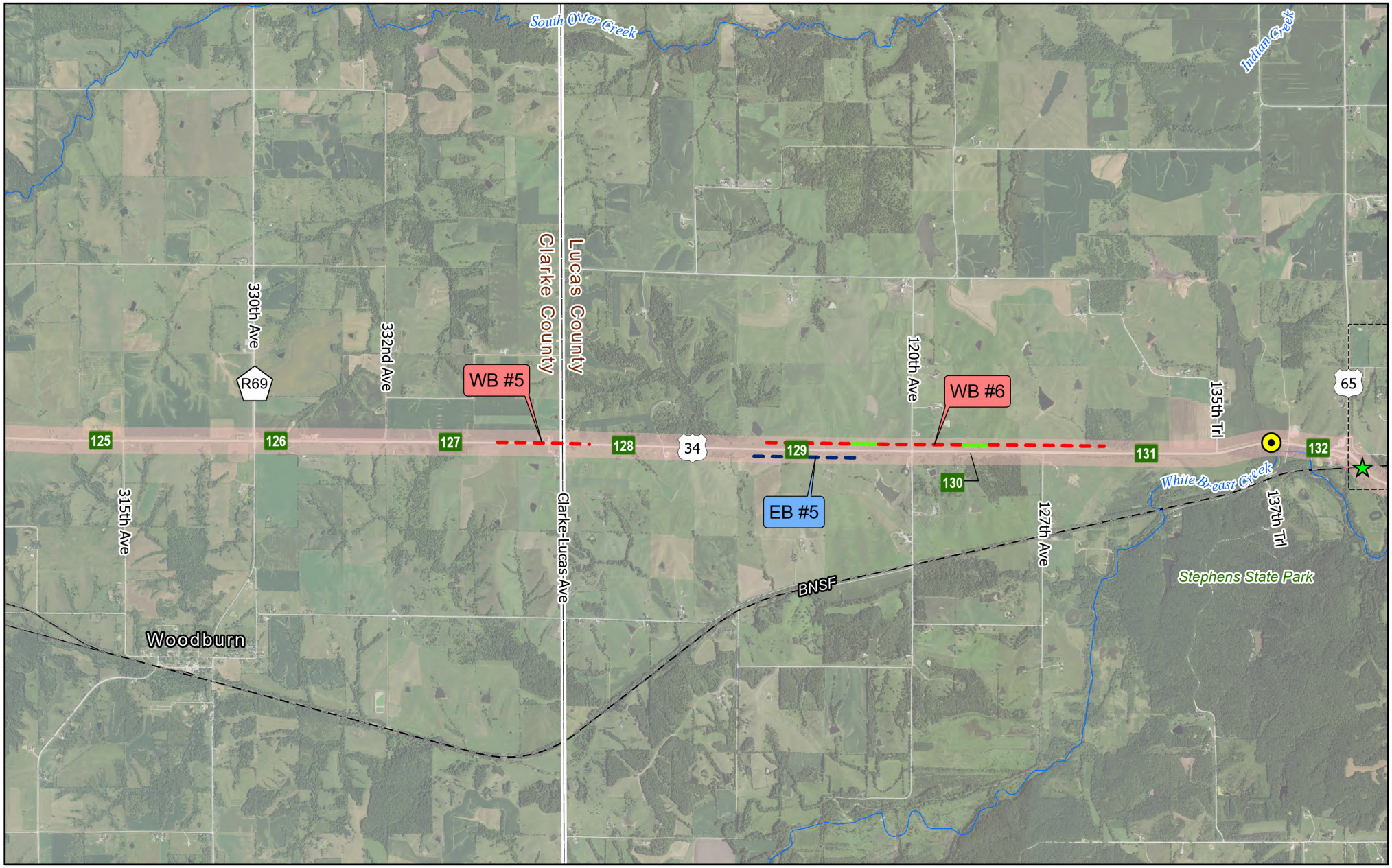
Base Map Source: NAIP
Data Sources: IADOT

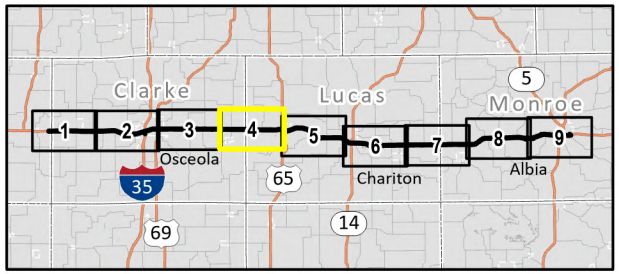
US 34 Super Two Study
Proposed Passing Lanes

Jacobs

IOWADOT

December 21, 2023





US 34 Corridor Legend

- Study Area
- Stream
- US 34 Mile Post
- Existing Bridge
- Existing Multiple Barrel Reinforced Concrete Box Culvert
- Existing Climbing Lane (EB)
- Existing Climbing Lane (WB)
- Proposed Passing Lane (EB)
- Proposed Passing Lane (WB)
- Extension of Climbing Lane into Passing Lane (WB and EB)

N

0 2,000 4,000

Feet

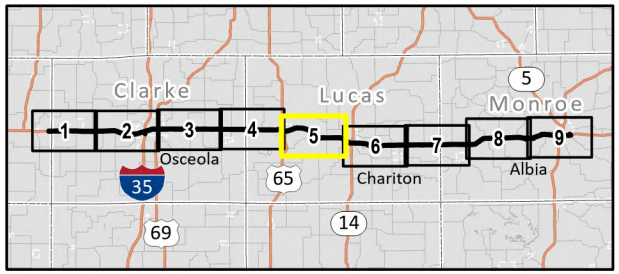
Base Map Source: NAIP
Data Sources: IADOT

US 34 Super Two Study
Proposed Passing Lanes

Jacobs

IOWADOT

December 21, 2023



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0 2,000 4,000

Feet

Base Map Source: NAIP
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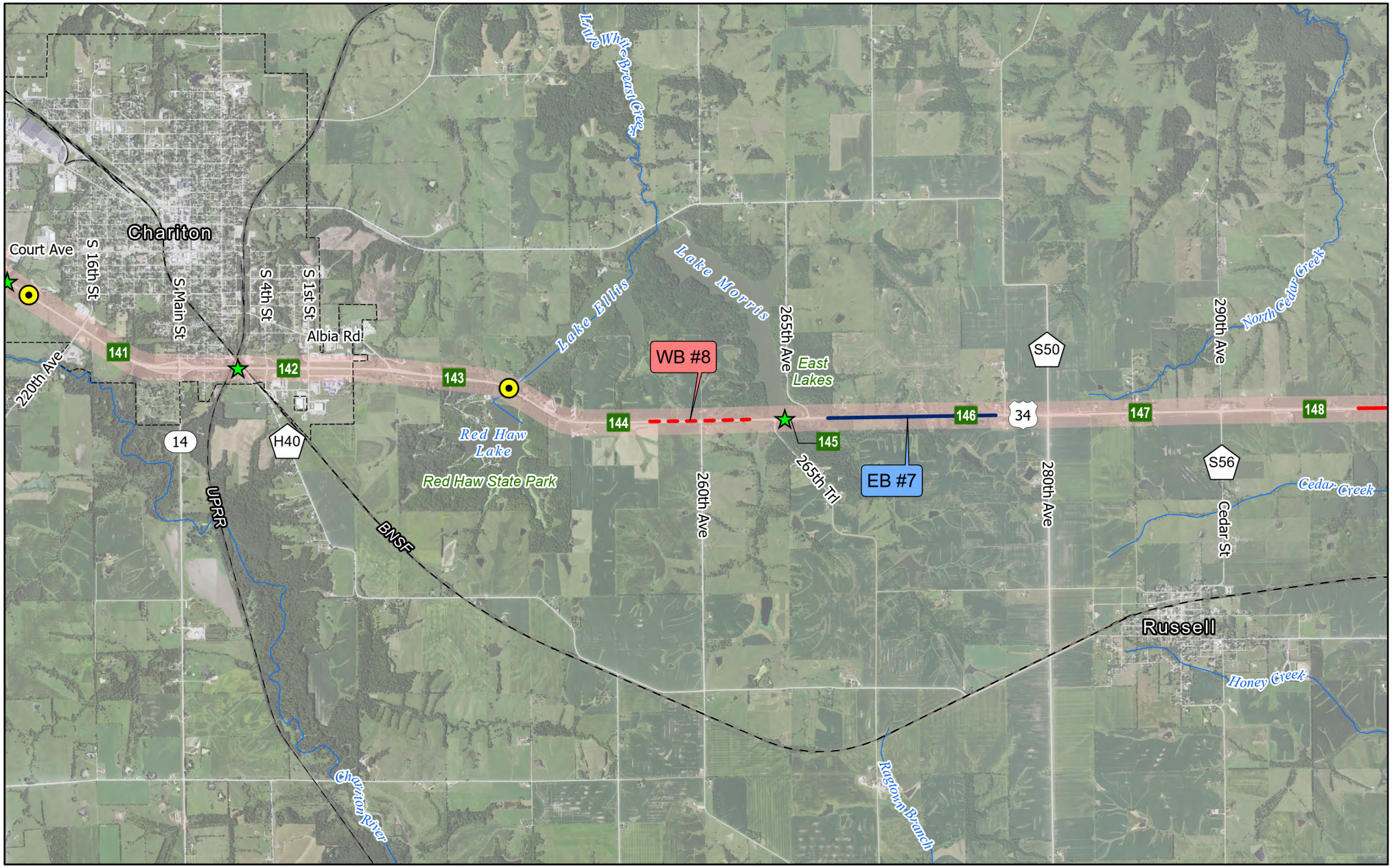
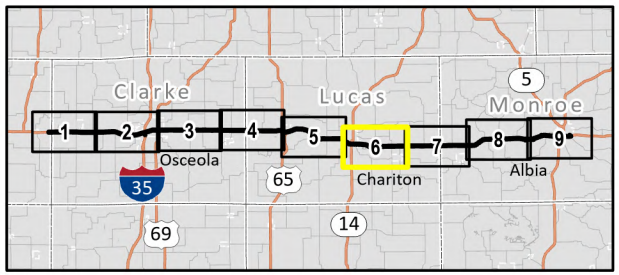
US 34 Super Two Study
Proposed Passing Lanes

Jacobs

IOWA DOT

December 21, 2023





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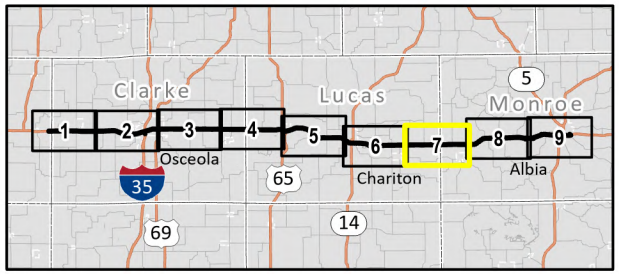
US 34 Super Two Study
Proposed Passing Lanes

Jacobs

IOWA DOT

December 21, 2023



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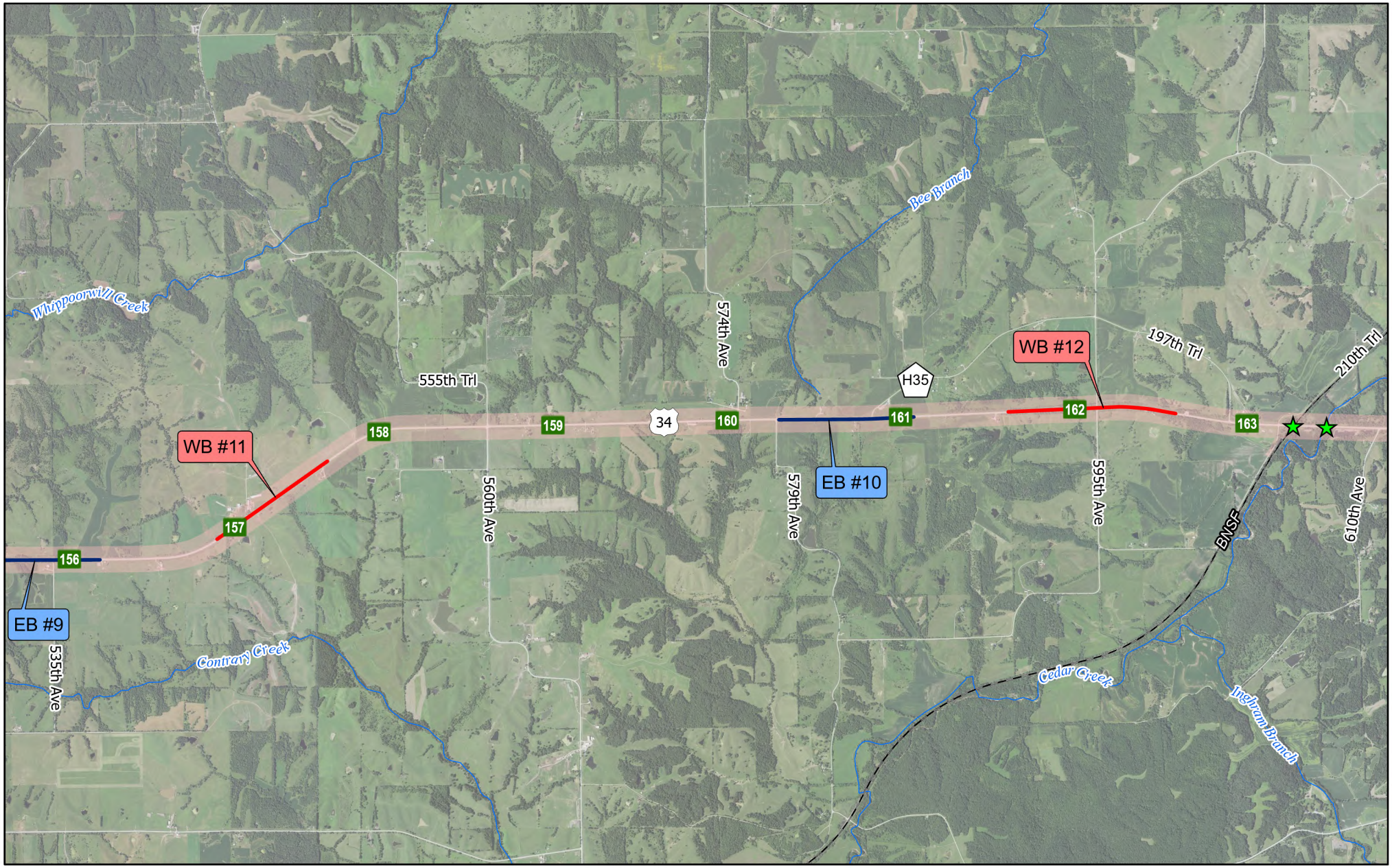
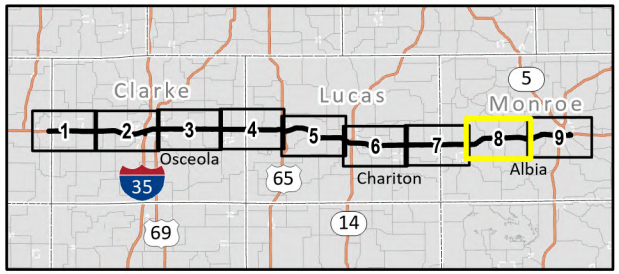
US 34 Super Two Study
Proposed Passing Lanes

Jacobs

IOWA DOT

December 21, 2023





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Feet

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US 34 Super Two Study
Proposed Passing Lanes

Jacobs

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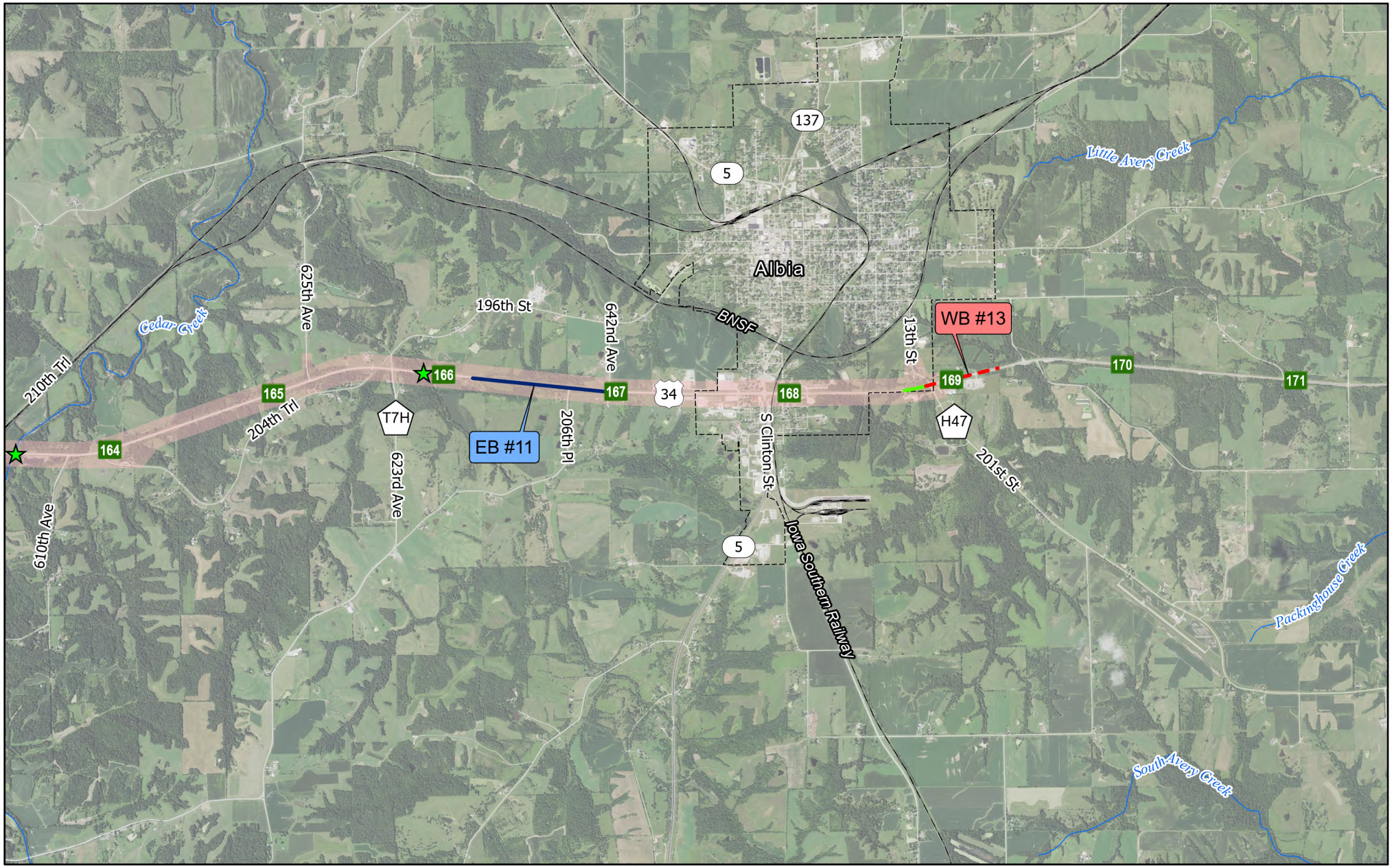

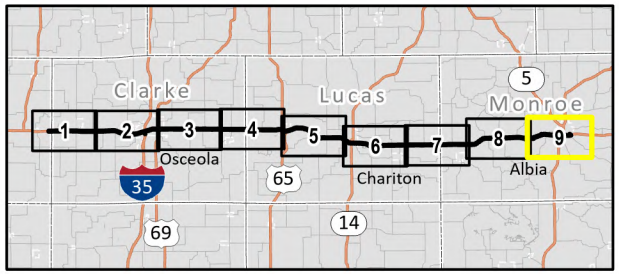

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Feet

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US 34 Super Two Study
Proposed Passing Lanes

Jacobs

IOWA DOT

December 21, 2023

APPENDIX G – IMAGES OF BEGINNING AND END OF PROPOSED PASSING LANES

Start of WB #1 Looking West

End of WB #1 Looking East

Start of EB #1 Looking East

End of EB #1 Looking West

Start of WB #2 Looking West

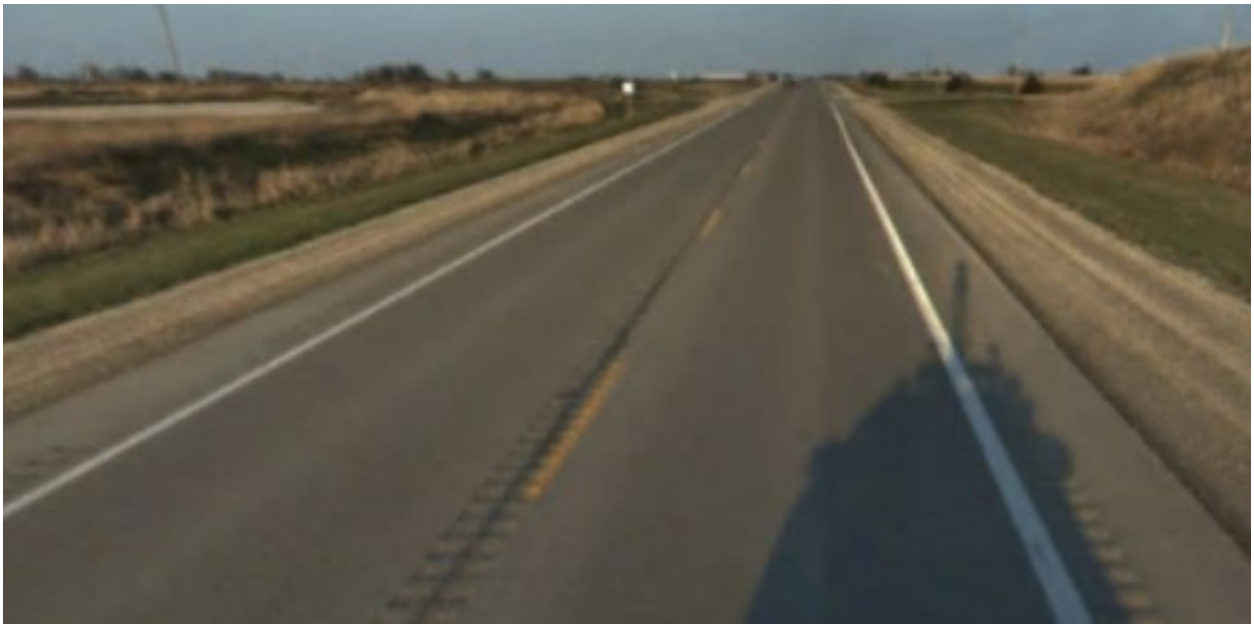
End of WB #2 Looking East

Start of EB #2 Looking East

End of EB #2 Looking West

Start of WB #3 Looking West

End of WB #3 Looking East



Start of EB #3 Looking East

End of EB #3 Looking West

Start of WB #4 Looking West

End of WB #4 Looking East

Start of EB #4 Looking East

End of EB #4 Looking West

Start of WB #5 Looking West

End of WB #5 Looking East

Start of EB #5 Looking East

End of EB #5 Looking West

Start of WB #6 Looking West

End of WB #6 Looking East

Start of EB #6 Looking East

End of EB #6 Looking West

Start of WB #7 Looking West

End of WB #7 Looking East

Start of EB #7 Looking East

End of EB #7 Looking West

Start of WB #8 Looking West

End of WB #8 Looking East

Start of EB #8 Looking East

End of EB #8 Looking West

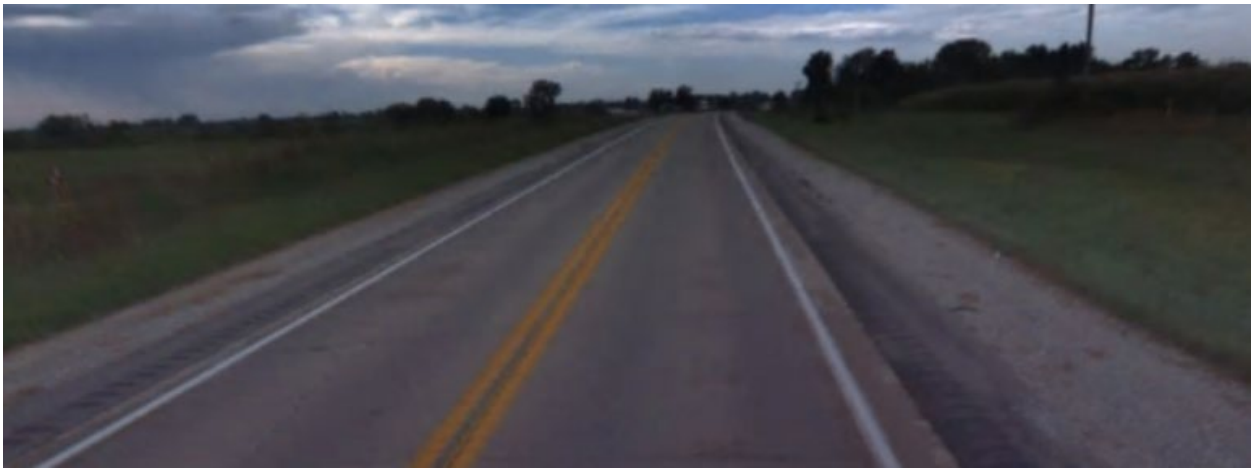
Start of WB #9 Looking West

End of WB #9 Looking East

Start of EB #9 Looking East

End of EB #9 Looking West

Start of WB #10 Looking West



End of WB #10 Looking East

Start of EB #10 Looking East

End of EB #10 Looking West

Start of WB #11 Looking West

End of WB #11 Looking East

Start of EB #11 Looking East

End of EB #11 Looking West

Start of WB #12 Looking West

End of WB #12 Looking East

Start of WB #13 Looking West

End of WB #13 Looking East