

PRELIMINARY ROADWAY AND INTERSECTION DESIGN STUDY

Edgewood Road Extension Blairs Ferry Road to Tower Terrace Road



November, 2008



PREPARED FOR:
**Corridor Metropolitan
Planning Organization**

50 Second Avenue Bridge
Cedar Rapids, IA 52401

PREPARED BY:



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I hereby certify that this Engineering document was prepared by me or under my direct personal supervision and that I am a duly Registered Engineer under the laws of the State of Iowa.

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Iowa Registration No. 14259

Date

I. INTRODUCTION AND SUMMARY

Study Purpose

This study was prepared to evaluate and assess feasible alignments for the Edgewood Road Extension between Blairs Ferry Road and Tower Terrace Road. The study also evaluated existing traffic operations and future traffic impacts on the Edgewood Road Extension corridor.

Executive Summary

Edgewood Road is a major arterial crossing north-south through the west side of Cedar Rapids and Hiawatha. The roadway carries a large volume of commuter traffic and is an important commercial corridor. Edgewood Road is the last Cedar River crossing inside the City limits of Cedar Rapids west of downtown. In Hiawatha, the Edgewood Road Extension will draw north-south through traffic off of other parallel routes (i.e. 18th Street and Miller Road) that are not designed to handle that traffic.

Intersection capacity analyses were completed for the three main intersections of interest in the Edgewood Road corridor.

- Edgewood Road and Blairs Ferry Road
- Miller Road (Future Edgewood Road) and Boyson Road
- Edgewood Road Extension and Tower Terrace Road

Existing traffic volumes were based on actual traffic counts collected during the A.M. and P.M. peak commuter periods. Future 2026 traffic volumes were based on 2040 traffic projections provided by the Corridor Metropolitan Planning Organization (CMPO) traffic demand model. The traffic projections assume an interchange will be constructed at I-380 and Tower Terrace Road.

All intersections currently operate at LOS C (on a scale of A – Unrestricted free flow; to F – Extreme delay and congestion) or better during both the A.M. and P.M. peak commuter periods with a few individual movement exceptions at Edgewood Road and Blairs Ferry Road.

After the Edgewood Road Extension has been completed, the future 2026 intersections will operate at LOS C or better for the A.M. and P.M. peak commuter periods, except for the LOS D for Edgewood Road and Blairs Ferry Road in the A.M. peak, which is commonly an acceptable LOS for an intersection of two major arterial roadways.

Two parcels of land have been identified as areas of interest for future design considerations. The first parcel is a cemetery which is owned by Monroe Township. The roadway should be designed and constructed to avoid significant impacts to this parcel. The second is a 30 acre parcel owned by the City of Hiawatha. Depending on final design, the west 60' will either be temporarily

impacted or need to be incorporated into the Edgewood Road Extension. An additional 40' should also be reserved for a total 100' right-of-way reservation until final roadway alignment and design are completed.

The following two alignments were developed for the Edgewood Road Study Area. Both alignments are the same south of Progress Drive.

- Loggerhead Road Alignment (East Alignment or Alt. A) – Align with existing Loggerhead Road and Tower Terrace Road intersection.
- Miller Road Alignment (West Alignment or Alt. B) – Align with existing Miller Road and Tower Terrace Road intersection.

Edgewood Road Extension alignment information (similar to Figure 10 in the body of this report) was presented at an open house style public meeting on June 12th, 2007. Members of the public were invited to view different alternatives and talk with representatives from Corridor Metropolitan Planning Organization and the Consultant about the corridor. Comment sheets were distributed to those in attendance. Close to 100 members of the public attended the open house (76 signed in).

Prevalent Comments (Provided by five or more attendees):

- Preserve existing mature trees as much as possible
- Landscaping/screening/berms should be included in the project
- Noise/sound control should be included in the project
- Privacy fencing between Edgewood Road corridor and established homes should be included in the project

Frequent Comments (Provided by two to four attendees):

- Concerned about speeds on Edgewood Road with respect to proximity of houses and children
- Concerns by Carpenter Road residents that Wolf Creek Trail cul-de-sac will increase traffic and speeds on Carpenter Road
- Concerns by Grey Wolf residents that Wolf Creek Trail cul-de-sac will increase traffic speeds on Grey Wolf
- Do no cul-de-sac Wolf Creek Trail – Keep connected to Edgewood Road

Other Comments:

- Do not disturb existing berm and landscaping at the east end of Wolf Creek Trail
- Cul-de-sac on Litchfield okay
- Move Wolf Creek Trail to the north and keep connected to Edgewood Road

- Connect Michael Drive to Grey Wolf as part of project to provide alternative access in and out of neighborhoods (rather than just Edgewood Road)
- Concern about concentrating traffic from Carpenter Road/Grey Wolf neighborhoods at only two intersections
- Realign Boyson Road to align with Wolf Creek Trail. Cul-de-sac Carpenter Road.
- An on-site walking meeting was held with Peck's. The roadway alignment and likely impacts to the Peck's property were discussed.

Both alignment alternatives north of Progress Drive were competitively evaluated based on:

- Development impact
- Impacts to adjacent properties,
- Interaction with the Tower Terrace Interchange
- Environmental
- Compatibility with the long range plan
- Favorable public input.

The alternatives were scored using a scale of 1 to 2 with 1 being the best. The lowest composite score is the most preferred alignment. Table E1 shows the results of the comparison.

Table E1. Competitive Alternative Comparison

Comparison Criteria							
Alternative	Development Impact	Impacts to Adjacent Properties	Interaction with Tower Terrace Interchange	Environmental	Long Range Plan	Public Input	Composite
A. Align with Loggerhead Road	2	1 8 Properties	2	1	1	2	9
B. Align with Miller Road	1	2 12 Properties	1	1	1	1	7

CONCLUSIONS AND RECOMMENDATIONS

Based on the previous discussions and analyses the following recommendations were developed:

- The Edgewood Road Extension should be constructed in two stages
 - Stage 1: 5-Lane Section from Blairs Ferry Road to Boyson Road and a 3-Lane Section from Boyson Road to tie into Loggerhead Road.
 - Stage 2: In the future when volumes justify, finish from Boyson Road to Loggerhead Road to complete the 5-Lane Section.
- Select the Miller Road Alignment (West Alignment or Alt. B) for Edgewood Road Extension from Progress Drive to Tower Terrace Road (Refer to Figure 15).
- Protect the integrity of the Edgewood Road intersection with Blairs Ferry Road by limiting access within the expected queuing areas of the intersection (Refer to Figure 10).
- Access points along Edgewood Road should be based on proposed land use, traffic generations, and City requirements.
- Realign Carpenter Road to line up with Boyson Road (Refer to Figure 10).
- Connect Wolf Creek Trail in as a Right-in / Right-out with no direct left turn access to the Edgewood Road Extension (Refer to Figure 10). Extend Miller Road to connect with Grey Wolf Drive (Refer to Figure 14).
- Consider walls, alignment adjustments, steeper grading in local spots to save trees, per public comment.
- Design and construct Edgewood Road Extension to avoid significant impacts to the Monroe Township Cemetery (Buffalo Cemetery) (Refer to Figure 5 and 10).
- Include a significant screening, noise mitigation, and landscaping plan with the project plan development, per public comment.
- As platting and development continues in the corridor, require 100' wide right-of-way reservations on each side of the proposed alignment (Figures 10 and 15) to provide a 200' wide swath. This reservation should remain in effect until the detailed design of the roadway is completed and final alignments are set. No permanent private improvements should be allowed in the reservation until the final right-of-way and easement limits are determined.

II. AREA CONDITIONS

A. Study Area

Study Corridor... The study corridor is located on the west side of I-380 in the northeast side of the City of Cedar Rapids and the southwest side of Hiawatha.

Figure 1, on the next page, is a location map showing the general vicinity and location of the corridor.

Generally, the study area between Blairs Ferry Road and Progress Drive is mixed residential and commercial land uses. North of Progress Drive the land use is predominantly agricultural.

Roadway Network... Edgewood Road is a major arterial crossing north-south through the west side of Cedar Rapids and Hiawatha. The roadway carries a large volume of traffic and is an important commercial corridor. Edgewood Road is the western most crossing of the Cedar River inside the City limits.

Edgewood Road has access points to IA Highway 100 in Northeast Cedar Rapids and to U.S. Highway 30 in Northwest Cedar Rapids. Posted speeds along the existing Edgewood Road in the Study Corridor are 35 mph.

Currently, Edgewood Road terminates as a T-intersection at Blairs Ferry Road. However, there are plans to extend Edgewood Road to the north. In the meantime, traffic traveling north into Hiawatha uses either 18th Street to the east, or Miller Road to the west. Edgewood Road



Edgewood Rd looking northbound

varies between a four and five lane urban section, which means two through lanes in each direction and a two-way-center-left turn lane at some locations. North of the Cedar River, full side street access (left, thru, and right) to Edgewood Road is provided only at signalized intersections.

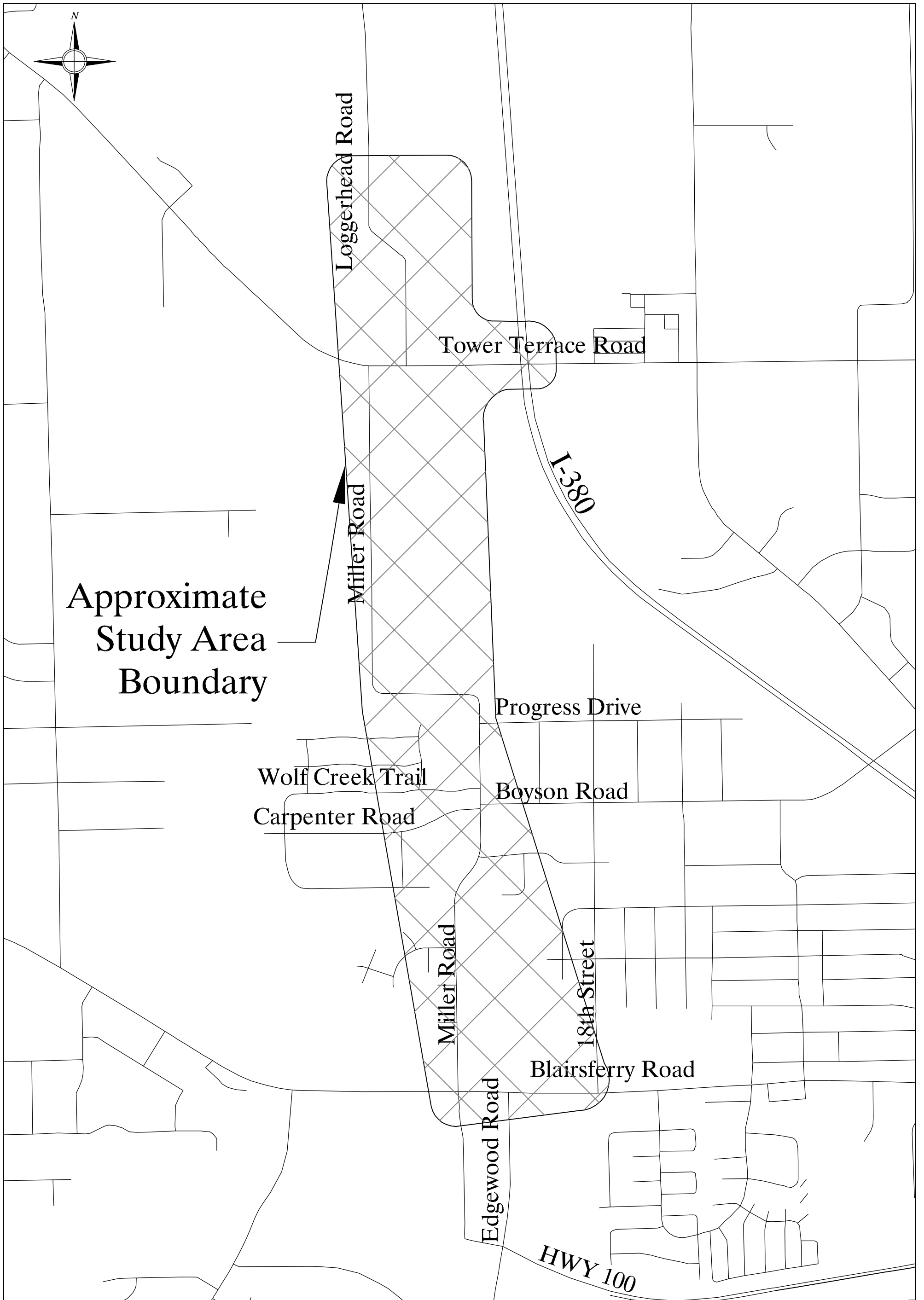


Figure 1

Location Map

Blairs Ferry Road is an east-west arterial that is five lanes wide east of Edgewood Road, and a three lane roadway west of Edgewood Road. Blairs Ferry Road is an urban arterial with curb and gutter and provides an important link between the Northeast side of Cedar Rapids with its interchange at I-380. West of Edgewood Road, Blairs Ferry Road serves the rapidly developing rural areas of Linn County out to the City of Palo.

Tower Terrace Road is presently a rural, two lane, east-west asphalt roadway through the Study Area. Tower Terrace Road crosses over I-380 but access to I-380 from Tower Terrace Road does not yet exist. Future plans for Tower Terrace Road are to build an interchange with Tower Terrace Road and I-380, and create a continuous east-west major arterial east to Highway 13.

Both Miller Road and Carpenter Road are rural cross sections with one lane in each direction, ditches, and gravel shoulders. Miller Road has sharp alignment curves beginning just north of Progress Drive, where Miller Road jogs about a half mile west before curving sharply back to the north. Miller Road ends at Tower Terrace Road as a T-intersection.

Carpenter Road is a 2-lane, chip seal road through a residential neighborhood. Eventually, Carpenter Road is expected to extend west and provide an indirect connection to Milburn Road.

Boyson Road is an urban cross section with curb and gutter and storm sewer intakes. Boyson Road extends east to an interchange with I-380 and continues east where it terminates at North 10th Street in Marion.



Boyson Rd and Miller Rd intersection
Looking westbound on Boyson Rd

Intersections and Geometry... The Edgewood Road and Blairs Ferry Road intersection is a signalized intersection. The intersection has four legs but the north leg is currently a commercial entrance to Peck's Nursery with very low traffic volumes.

The intersection of Miller Road with Boyson Road and with Carpenter Road operates under two-way stop control. Boyson Road and Carpenter Road are the two stop sign controlled legs. Carpenter Road and Boyson Road do not directly line-up across Miller Road. Maneuvers are more difficult for both Carpenter Road and Boyson Road vehicles because of the intersection offset. Wolf Creek Trail intersects Miller Road about 190' north of Boyson Road. The intersection of Miller Road and Tower Terrace Road form a T-intersection. Miller Road is stop sign controlled.

Existing Traffic Volumes... Existing traffic volumes were based on actual traffic counts collected by the Consultant during the A.M. and P.M. peak commuter periods. Peak hour data were collected in September, October, and December. Mechanical traffic count data were also collected and recorded using tube style counters. Data were collected in August, September, and November 2006. See Figures 2 and 3 on the next pages for existing peak hour traffic counts and mechanical traffic data.

As can be seen from Figure 2, both the eastbound to northbound left at 18th Street and Blairs Ferry Road, and the westbound to northbound right on Miller Road at Blairs Ferry Road is significant (154 vehicles per hour and 193 vehicles per hour, respectively). The same is true about the traffic making the complementary movements (southbound to westbound right at 18th Street and southbound to eastbound left at Miller Road).

Edgewood Road currently ends as a T-intersection with Blairs Ferry Road, just south of the intersection Edgewood Road carries about 20,400 vehicles per day (vpd). Blairs Ferry Road carries about 16,000 vpd both east and west of Edgewood Road. The observed peak weekday commuter periods occurred as follows:

As can be seen in Figure 3, Tower Terrace Road is a lightly traveled roadway (about 2,000 vehicles per day). This traffic volume is normal for a fringe rural road.

A.M. Peak Hour	7:00-8:00
P.M. Peak Hour	4:30-5:30

The vehicle mixture includes a percentage of trucks (approximately 5% during the A.M. peak, and about 2% during the P.M. peak). See Appendix C for the existing 24-hour traffic counts.

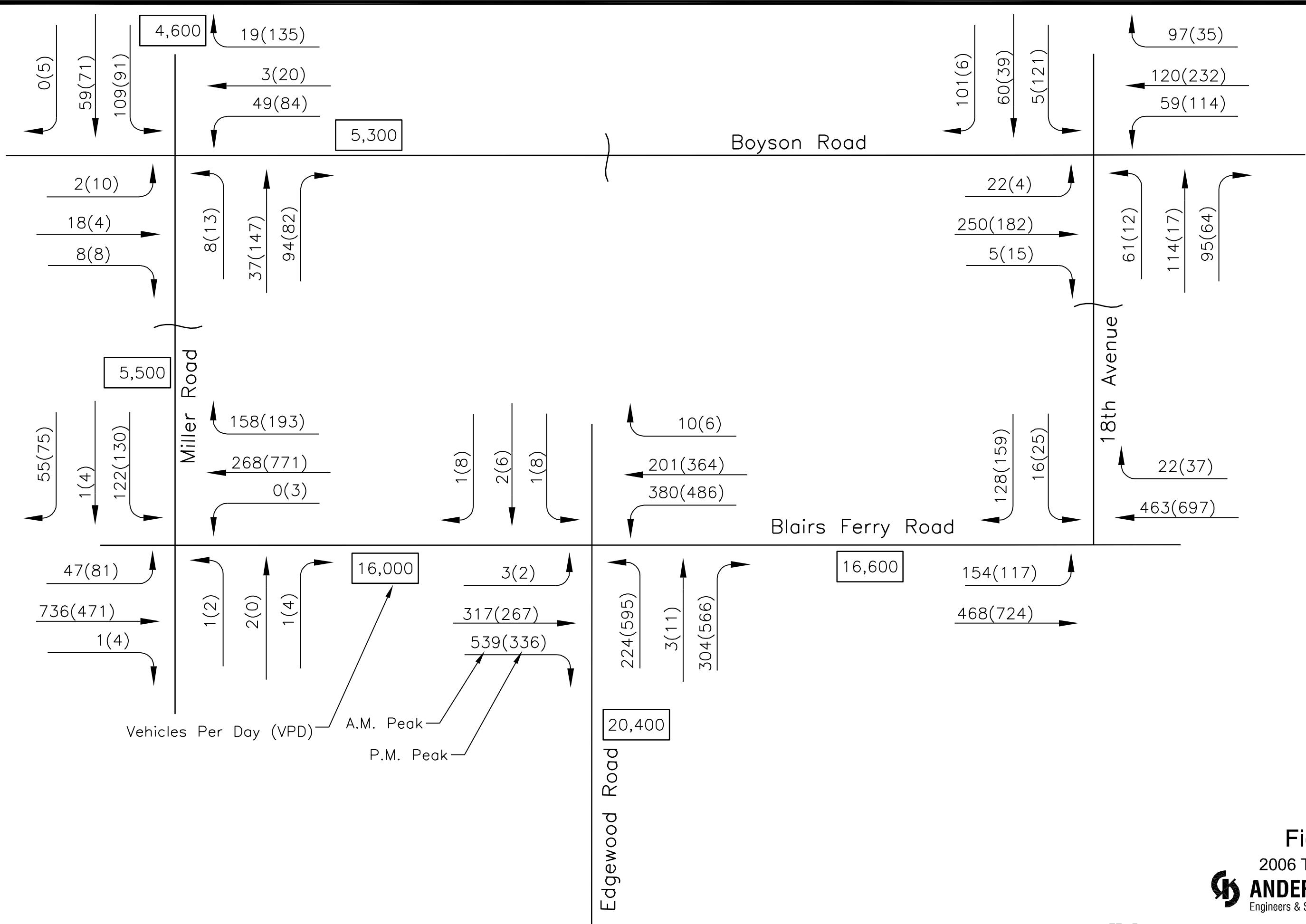


Figure 2
2006 Traffic Volumes
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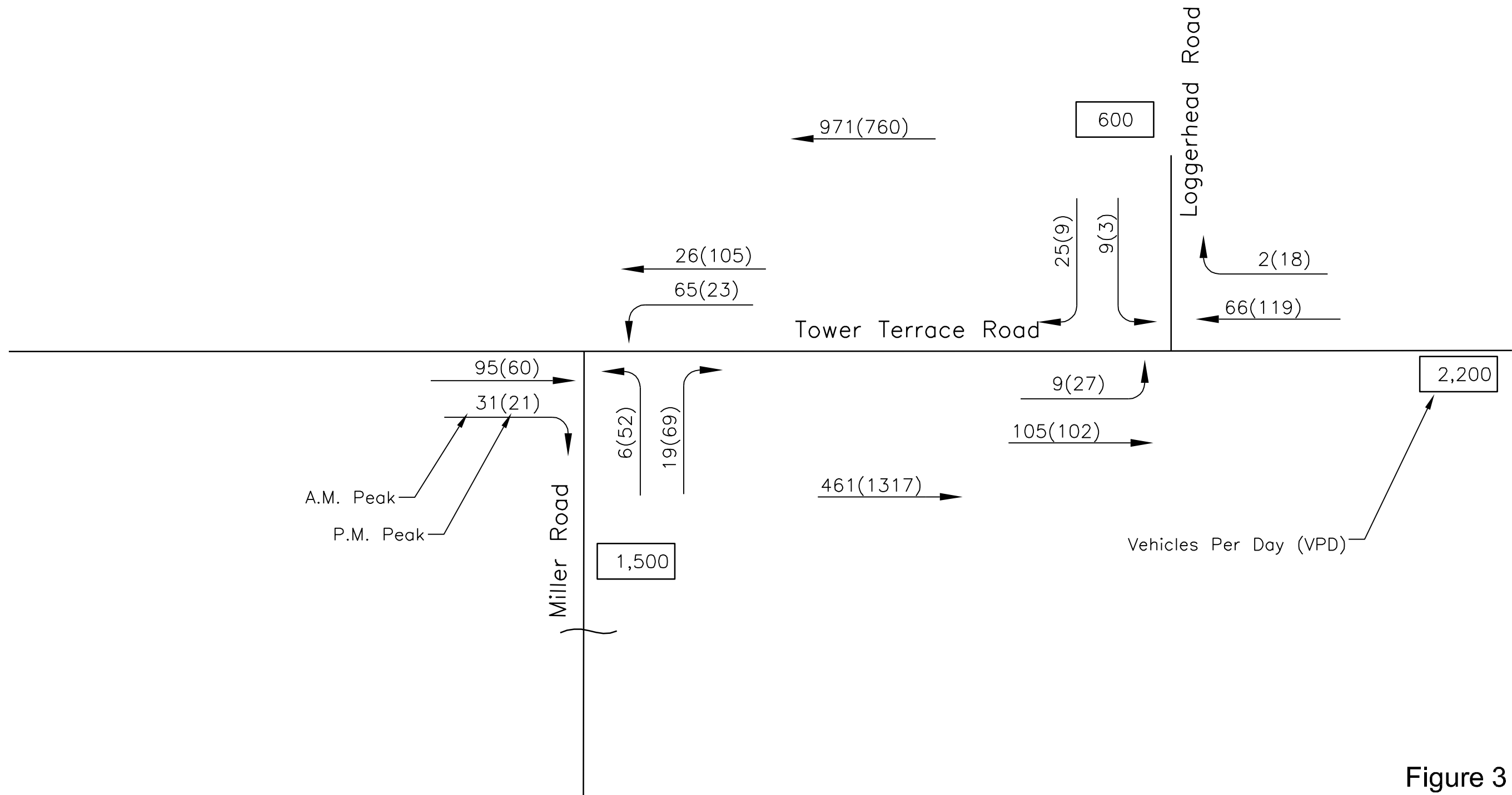


Figure 3

2006 Traffic Volumes

B. Study Area – Land Use

Existing Land Uses...

Land uses along the Study Area are a mixture of commercial, residential, and agricultural.

Convenience stores, a landscape nursery, and single family residences are typical land uses south of Progress Drive. North of Progress Drive land is used primarily for agriculture purposes.



Looking north at the first of two 90-degree turns on Miller Rd

Anticipated/Approved Future Development... The Cities of Cedar Rapids and Hiawatha are both growing to the northwest. Residential neighborhoods continue to expand to the west of the Study Area. Future annexations and developments are anticipated.

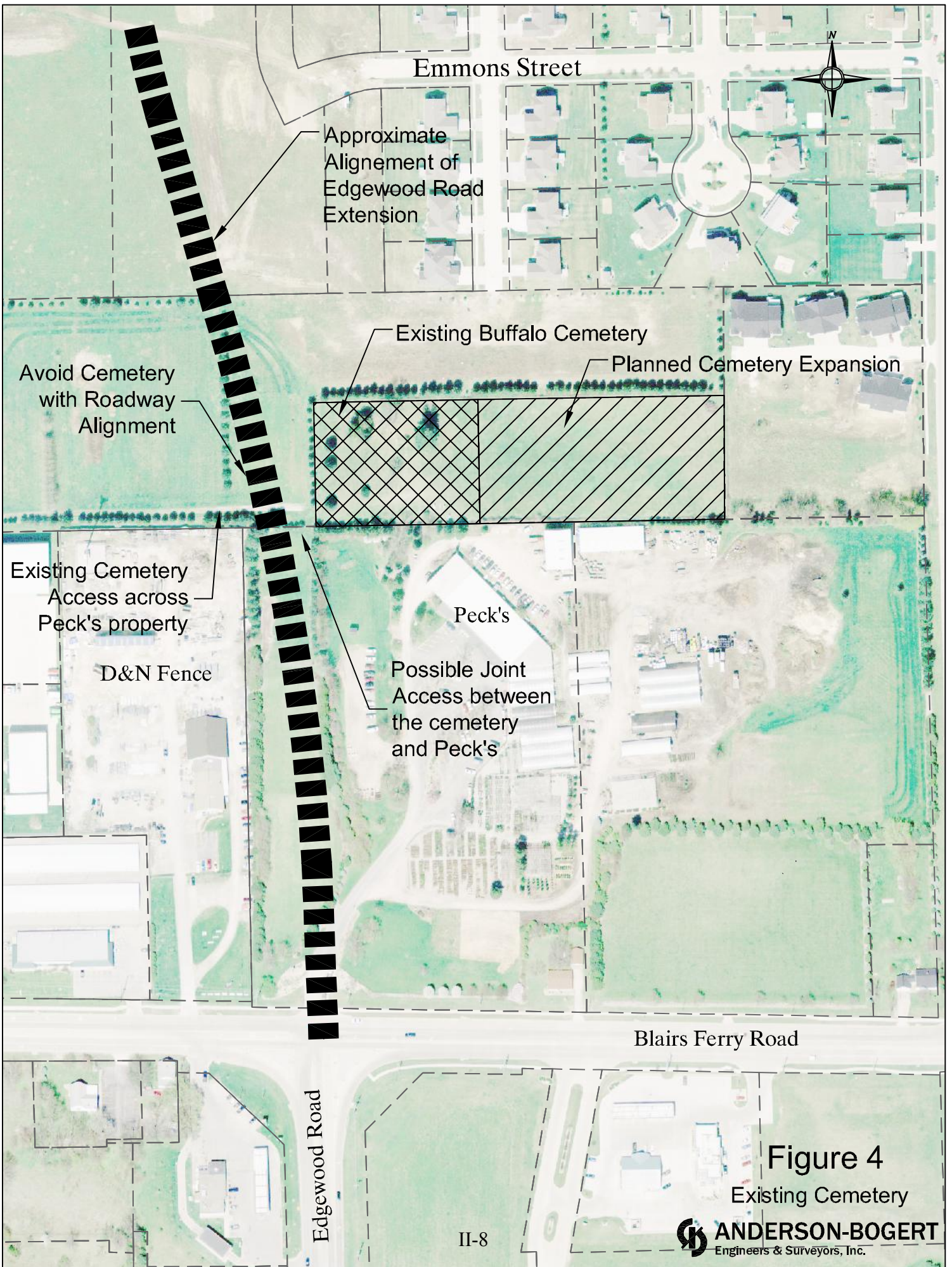
During the study process existing and planned future land uses were identified for two parcels of land. The first parcel is a cemetery owned by Monroe Township (Buffalo Cemetery). This cemetery is located north of the Peck's property, as shown in Figure 4. The Township will be expanding the cemetery to the east in land already acquired for this purpose. As such, any roadway design should avoid significant impacts to this parcel.

An interchange for Tower Terrace Road and Interstate 380 is anticipated in the future. An Interchange Justification Report was recently submitted to Iowa DOT by the City of Hiawatha that details the interchange configuration and future traffic.



Southwest corner entrance to City of Hiawatha parcel

A future roadway connection from the extended Edgewood Road to Milburn Road is in the CMPO Long Range Plan. The connector will serve as an east-west roadway link to improve



circulation and access midway between Blairs Ferry Road and Tower Terrace Road.

The second parcel is 30 acres owned by the City of Hiawatha. This parcel is located north and east of the first 90 degree turn on northbound Miller Road, see Figure 5. Depending on final design, the west 60' will either be temporarily impacted or need to be incorporated into the Edgewood Road Extension. An additional 40' should also be reserved for a total 100' right-of-way reservation until final roadway alignment and design are completed.

The City should also reserve 100' on either side of the Edgewood Road alignment on future plat submittals so that sufficient space is retained for alignment adjustments, grading, utilities, drainage, and other contingencies not identified at this level of planning. Out of the 200' wide reservation, it is intended only 120' will ultimately be permanent roadway right-of-way.

C. Collision History

Collision Data... The Iowa Department of Transportation program Mapping Analysis Tool (CMAT) was used to evaluate collision data from January 2001 through December 2006.

Collision data were reviewed and analyzed for:

- Personal injuries / property damage
- Number and type of collisions
- Crash rate relative to the amount of traffic

The evaluation years for Edgewood Road and Blairs Ferry Road include a change of intersection control. The intersection was signalized in 2005. The change to signal control can cause an adjustment in the pattern and type of certain collisions. The alteration invalidates collision data for this intersection prior to 2005.

During the two-year period starting in 2005 18 collisions were reported at the Edgewood Road and Blairs Ferry Road intersection, including 2 personal injuries (2 possible). Property damage for the 18 collisions totaled around \$86,000 or about \$4,800 average cost per collision.

The most common identified major cause for a collision for Edgewood Road and Blairs Ferry Road was "Unknown" (six

City of Hiawatha

30 Acres

Approximate Alignment of Edgewood Road Extension

60'
40'

100' Reservation from Center of Edgewood Road Alignment

West 60' likely affected by Edgewood Road

40' Additional Reservation until designs are completed. This area may require roadway grading, utilities, etc. depending on final alignment and design.

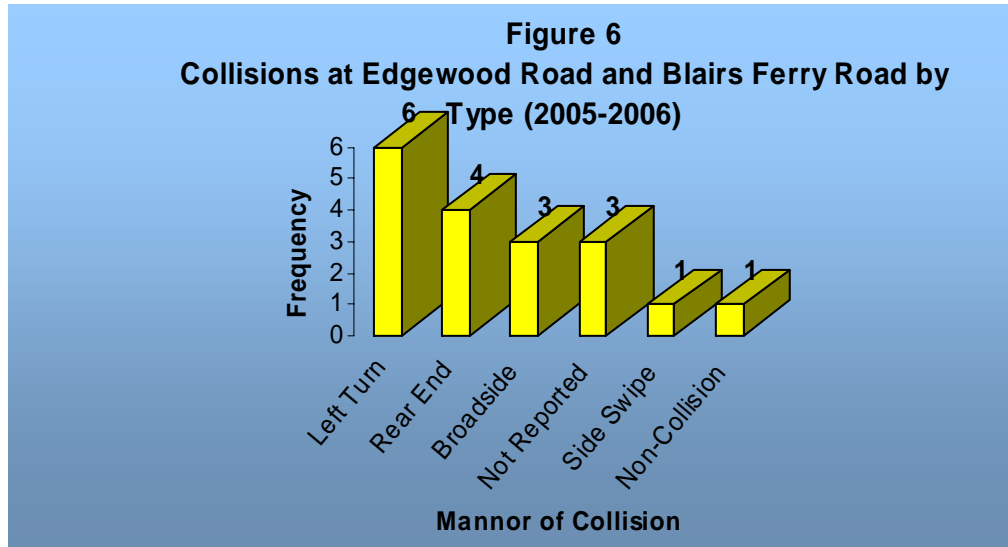
First Bend in Miller Road

Progress Drive



Figure 5

collisions). The next highest was “Failure to Yield the Right-of-Way”: while making a left turn and “Other” (with four collisions each).



Total number of crashes for this intersection is only part of the picture. To get a more complete understanding, collision rates (number of collisions divided by the Average Daily Traffic of one-way counts of all streets entering) need to be calculated. Collision rates provide an indication of the number of collisions relative to the amount of traffic (or exposure). Collision rates are used universally and Iowa DOT has developed average comparative rates for similar type facilities.

The calculated rate for the Edgewood Road and Blairs Ferry Road intersection was 0.93 per million entering vehicles (MEV). This rate is below the Iowa DOT average of 1.0 per MEV for a similar municipal intersection. Rates are published by the Iowa DOT Bureau of Transportation Safety.

There were 6 collisions between 2001 and 2006, according to CMAT, at the intersection of Miller Road and Boyson Road or at Miller Road and Tower Terrace Road. There did not appear to be any pattern to the few collisions documented. One of these collisions resulted in a minor injury.

The calculated rate for Boyson Road and Miller Road was 0.18 per MEV. This rate is far below the Iowa DOT average of 0.70 per MEV for a similar municipal intersection.

The unsignalized intersection of Miller Road and Blairs Ferry Road had 31 collisions reported between 2001 and 2006, including 18

that resulted in personal injuries (7 minor, 6 possible, and 5 unknown). Property damage for the 31 collisions totaled around \$165,000 or about \$5,300 average cost per collision.

The most common major cause for a collision was “Failure to Yield the Right-of-Way”: from a stop sign” with 14 incidents. The next highest “Failure to Yield the Right-of-Way: making a left turn” had eight. The calculated rate was 0.75 per MEV. This rate is just below the Iowa DOT average of 0.80 per MEV for a similar municipal intersection.

III. PROJECTED TRAFFIC

A. Future Traffic

Future Traffic Projections... Future 2026 volumes were based on future traffic projections provided by the Corridor Metropolitan Planning Organization (CMPO) travel demand model. See Figure 7 and Figure 8 for future 2026 Average Annual Daily Traffic (AADT) volumes and A.M. and P.M. peak hour movements.

Figure 6 shows the existing traffic volumes on Edgewood Road south of Blairs Ferry Road are expected to increase by 150% by 2040. The average yearly growth rate for traffic on Edgewood Road over 34 years is 1.8%. Blairs Ferry Road is expected to increase by over 60% in the next 34 years, which is a 1.5% average yearly growth rate. By the design year 2026 Edgewood Road will have increased to about 29,000 AADT and Blairs Ferry Road to 22,400 AADT.

The future traffic projections provided by CMPO for the Edgewood Road Extension north of Boyson Road include Tower Terrace interchange. The access to I-380 will increase volumes on Tower Terrace Road. Based on the traffic projection it is assumed the interchange ramps will operate under signalized control.

Comparing back to Figure 2, Figure 7 shows traffic volumes on Miller Road and on 18th Street decreasing. The lower traffic volumes on those two streets are consistent with the expectation that Edgewood Road Extension will draw north-south through traffic off of those streets.

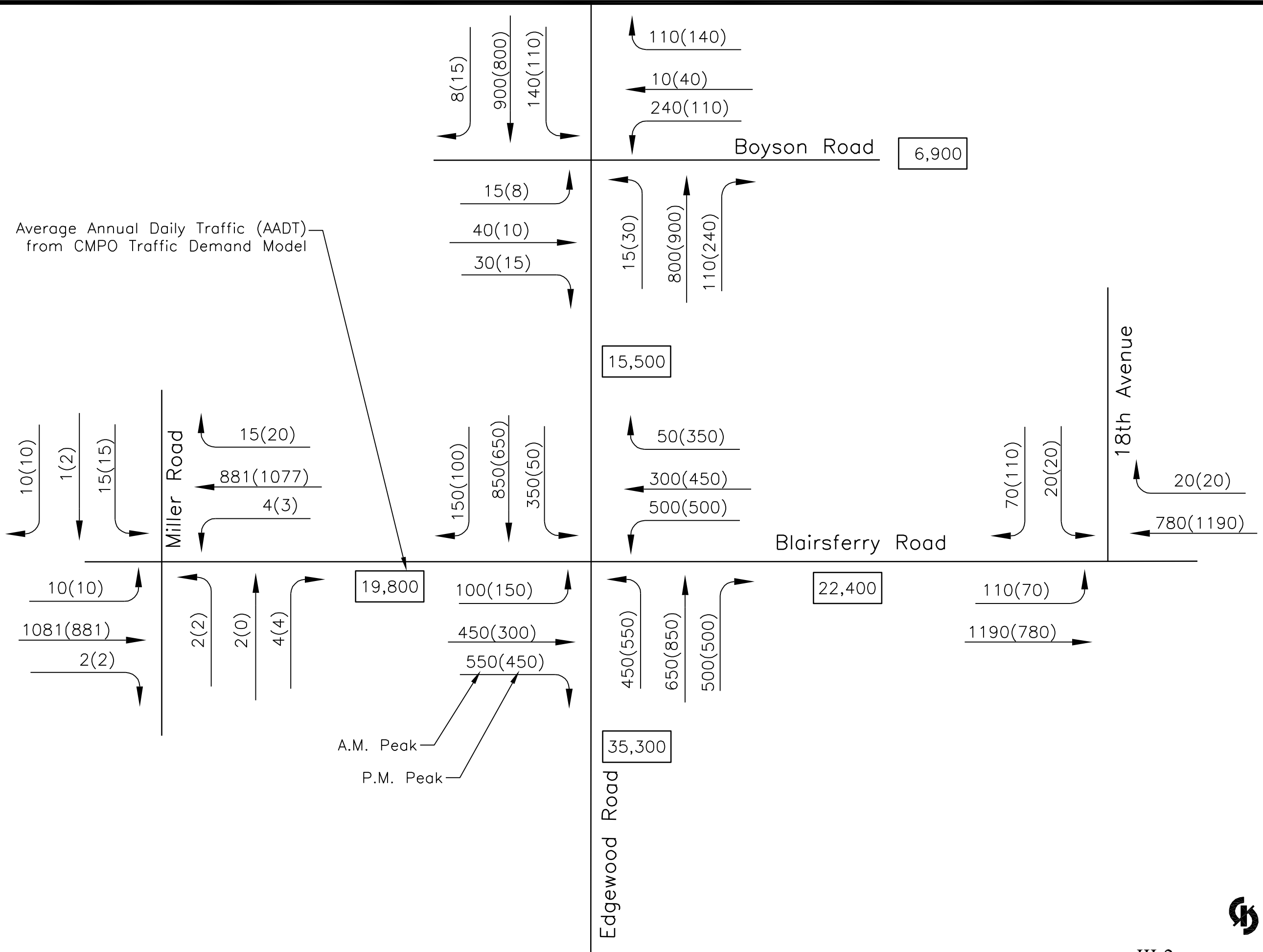


Figure 7
2026 Traffic Volumes
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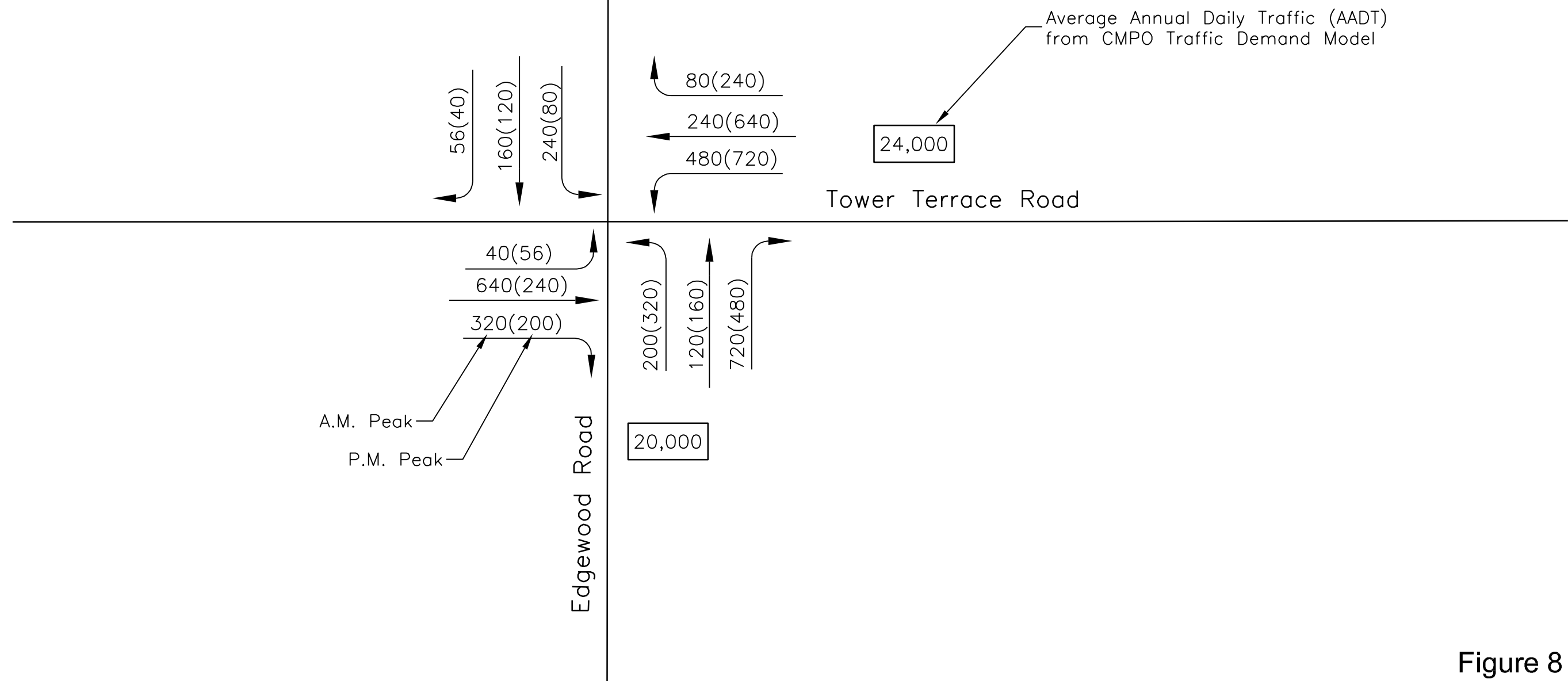
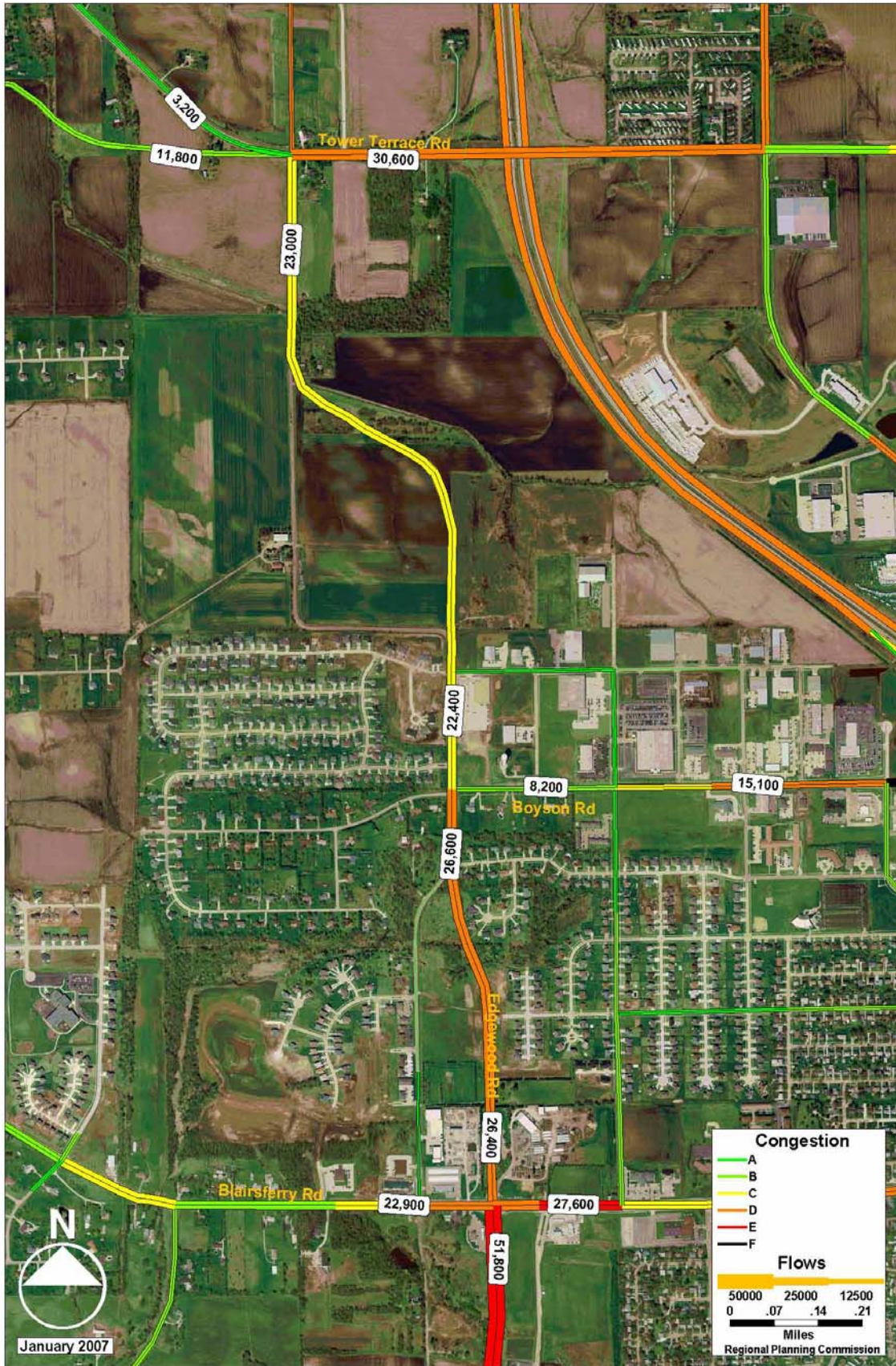


Figure 8
2026 Traffic Volumes
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2040 Forecast AADTs Hiawatha PRID Study



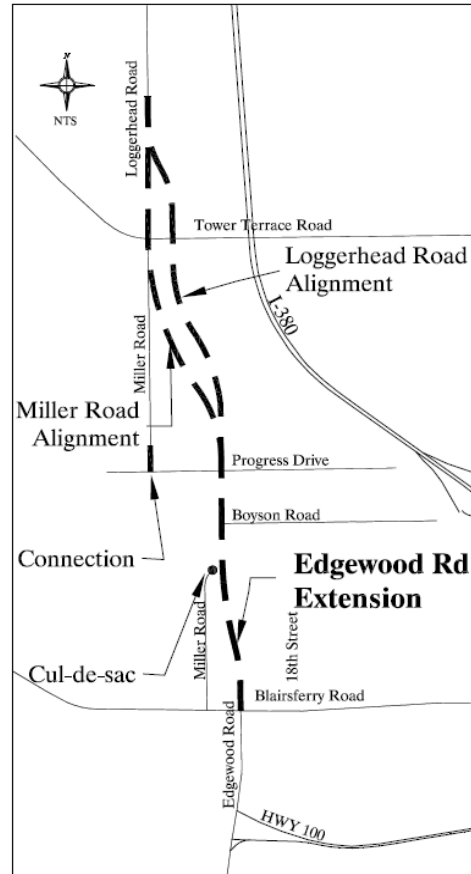
IV. ANALYSES AND PRELIMINARY DESIGN LAYOUT

A. Preliminary Design Layout

South of Progress Drive the Edgewood Road alignment is more or less defined. North of Progress Drive two different alignments (Miller and Loggerhead alignments) were analyzed using both existing (2006) and future (2026) traffic (See figure at right).

South of Boyson Road the Edgewood Road Extension will be constructed as a 5-lane section, with 2 through lanes in each direction and a raised median which becomes a left turn lane at the intersections. The new 5-lane section will be from Blairs Ferry Road to Boyson Road.

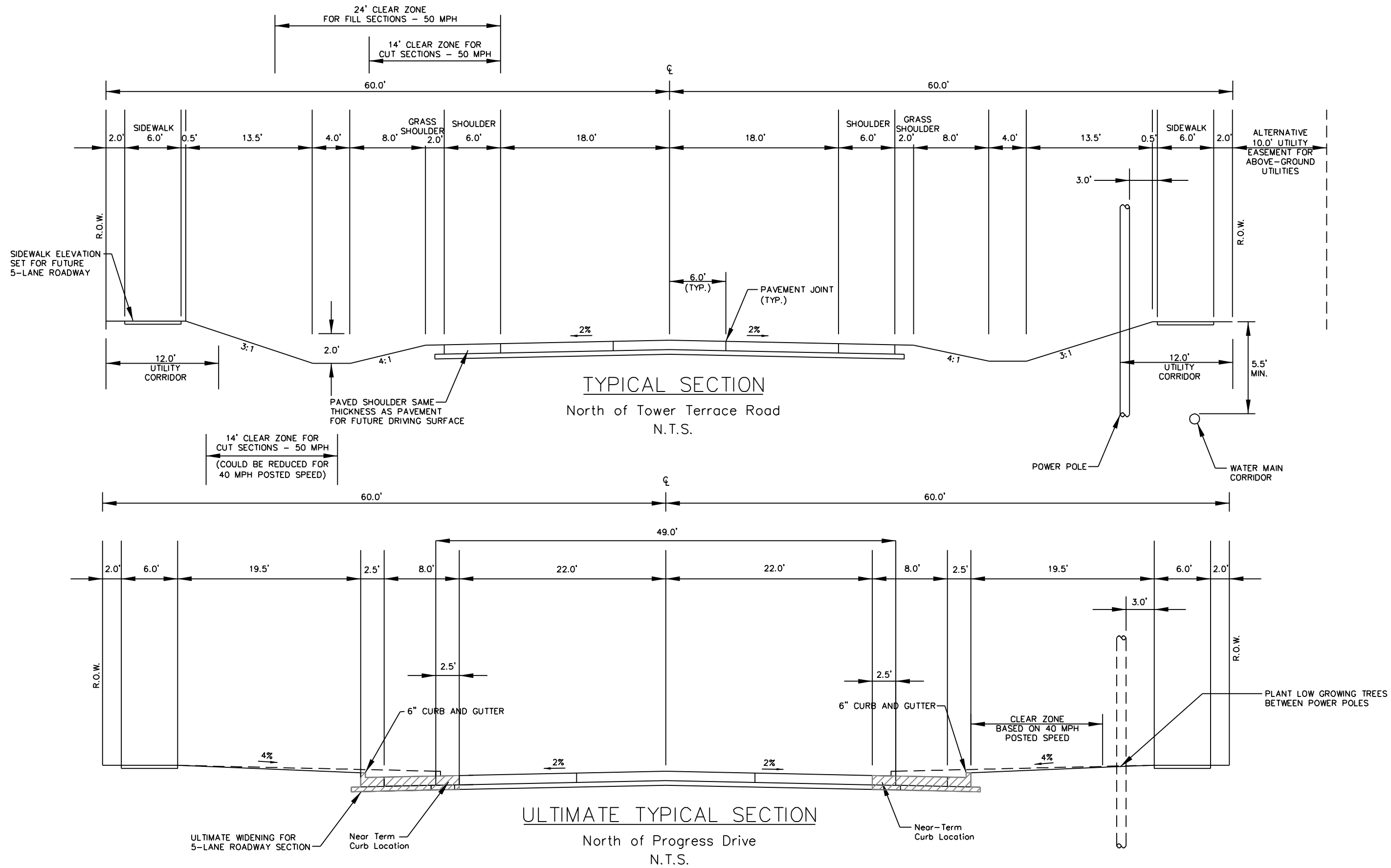
The Edgewood Road Extension north from Boyson Road to the ending point north of Tower Terrace Road will only have 3-lanes of the ultimate 5-lanes constructed. However, sufficient Right-of-Way should be acquired to accommodate for full 5-lane improvements. Access points will be based on proposed land use, traffic generations, and City requirements. The 3-lane section should remain until future traffic volumes increase sufficiently to justify completing the additional lanes. A typical section is shown in Figure 9.



Blairs Ferry Road to Boyson Road


The Edgewood Road Extension between Blairs Ferry Road and Boyson Road has been generally defined for years. Right-of-Way in some areas has already been dedicated. The roadway alignment has been positioned in this corridor to minimize impacts to existing properties and to utilize as much existing Right-of-Way on Miller Road as possible. Figure 10 shows detailed layout of the preliminary design including annotations of public comments received. Table 1 is a rough cost estimate for the improvements.

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LCRPC NO: 2006-01

DRAWN BY: TPM
APPROVED BY: JCM
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 Corridor Metropolitan
Planning Organization

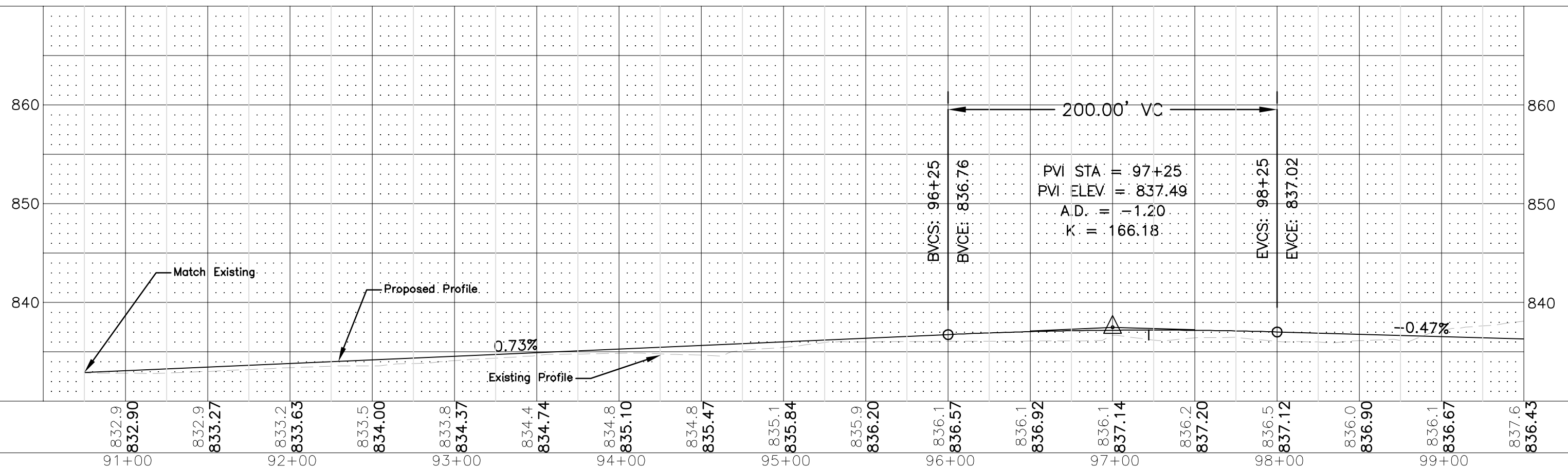
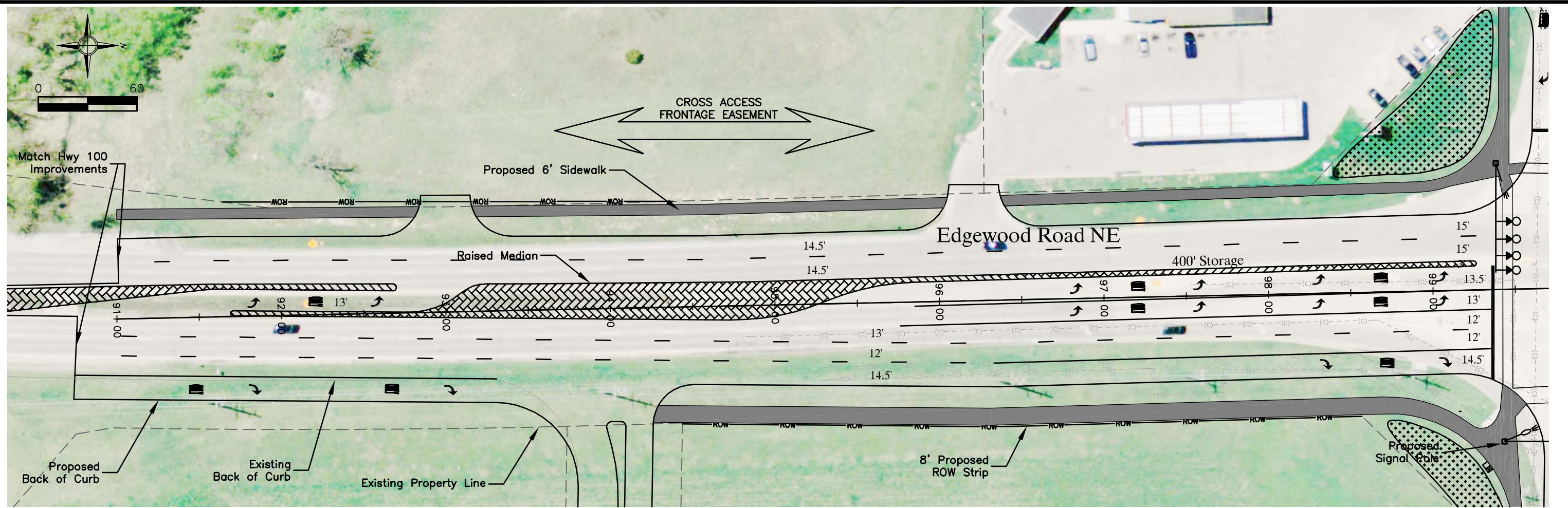
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Engineers & Surveyors, Inc.

Preliminary Roadway and
Intersection Design Study

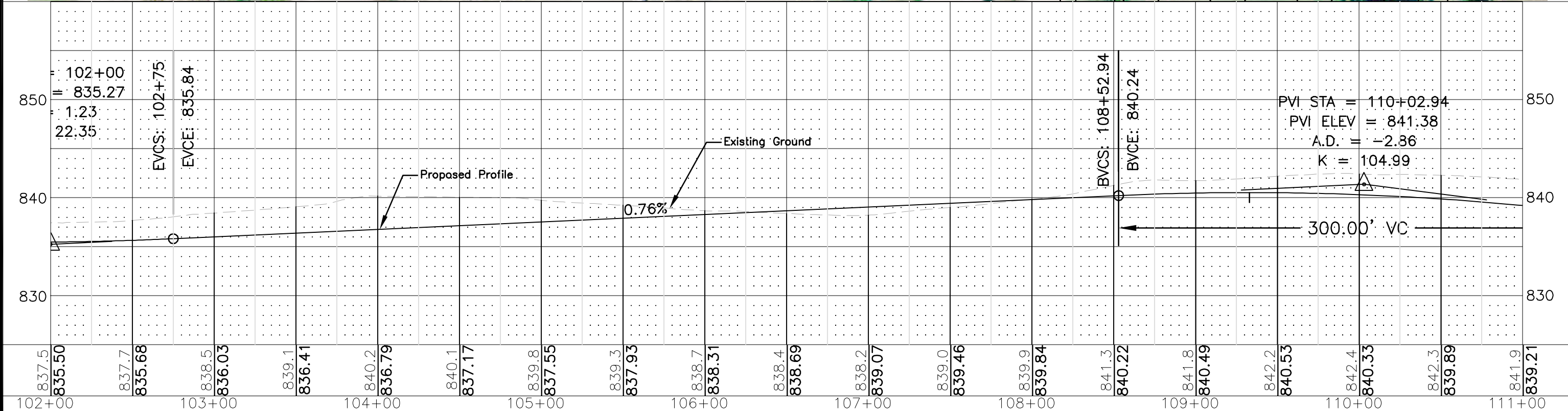
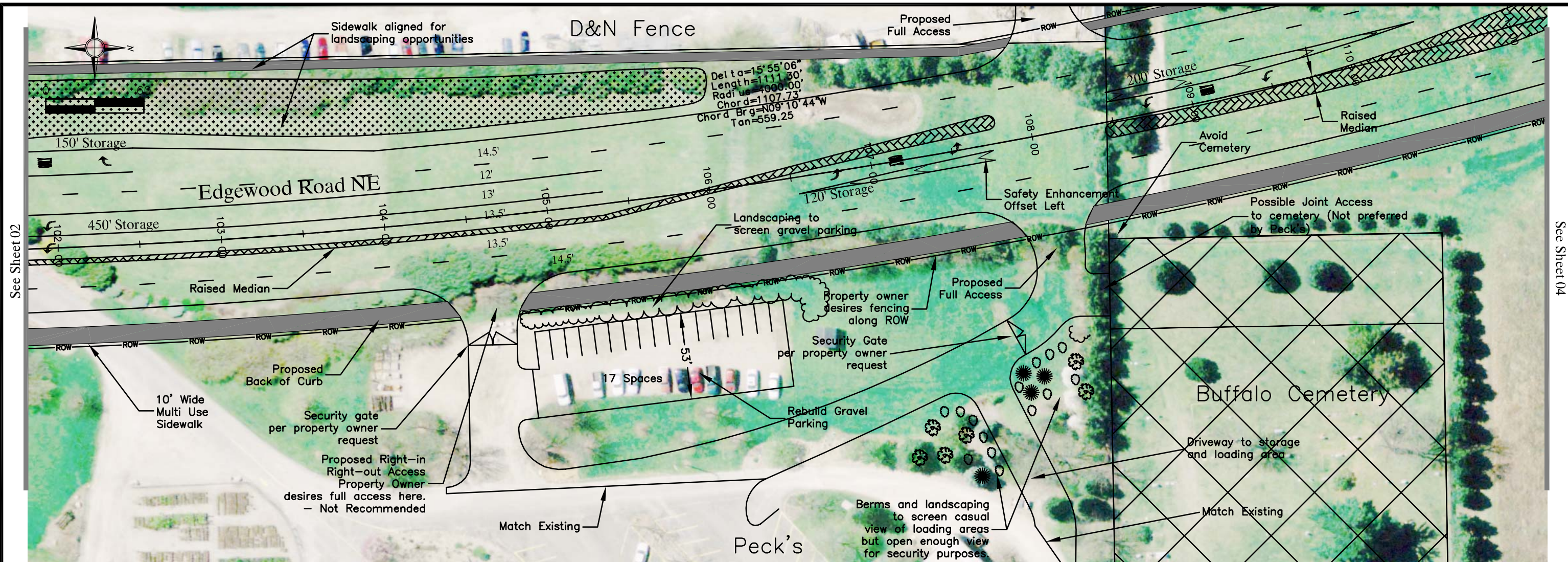
Figure 9
Typical Sections

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OF
IV-2

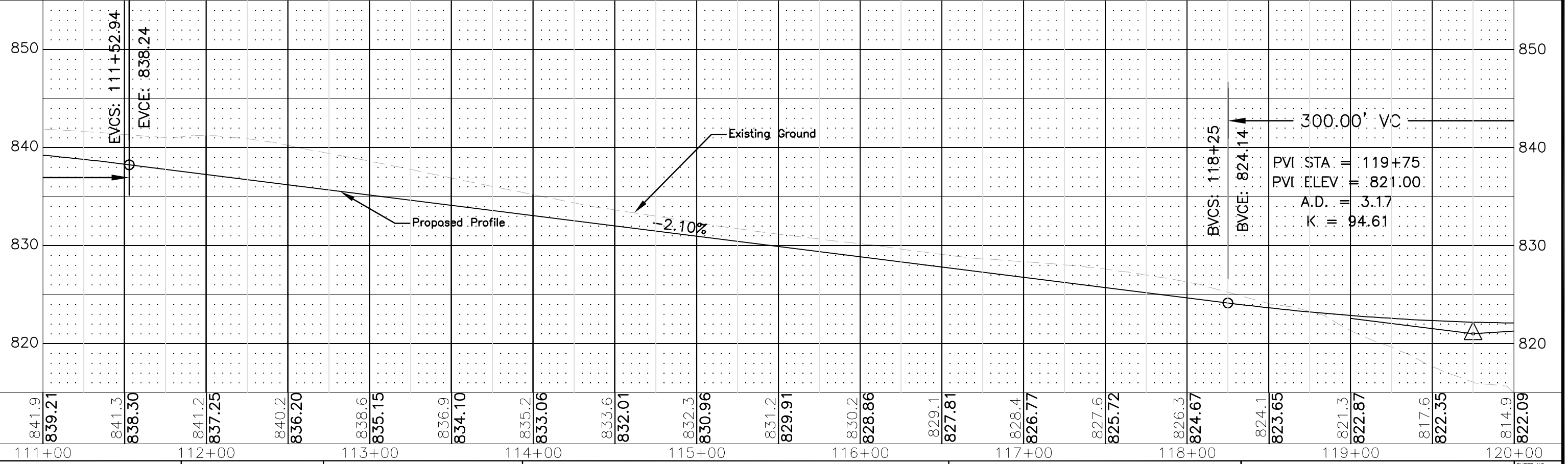
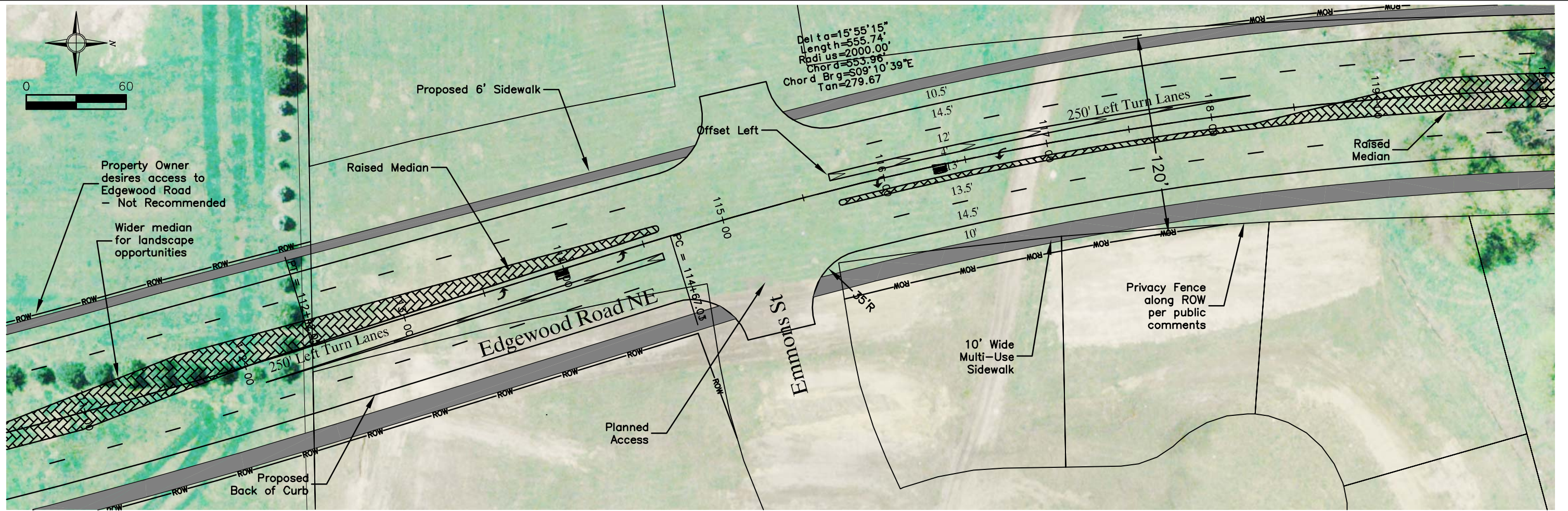
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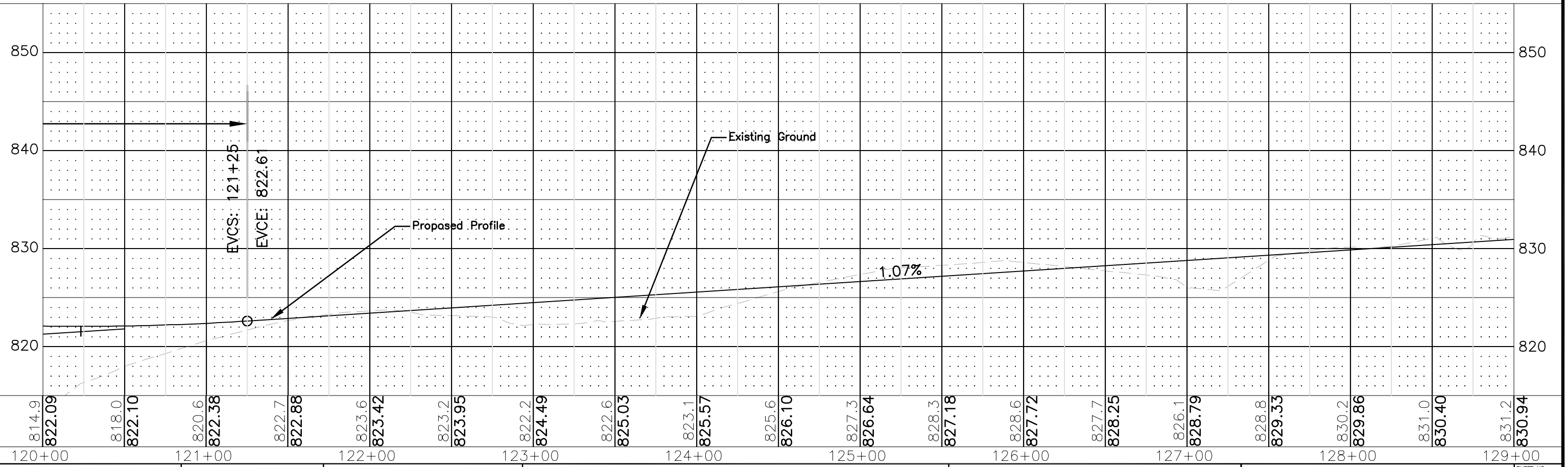
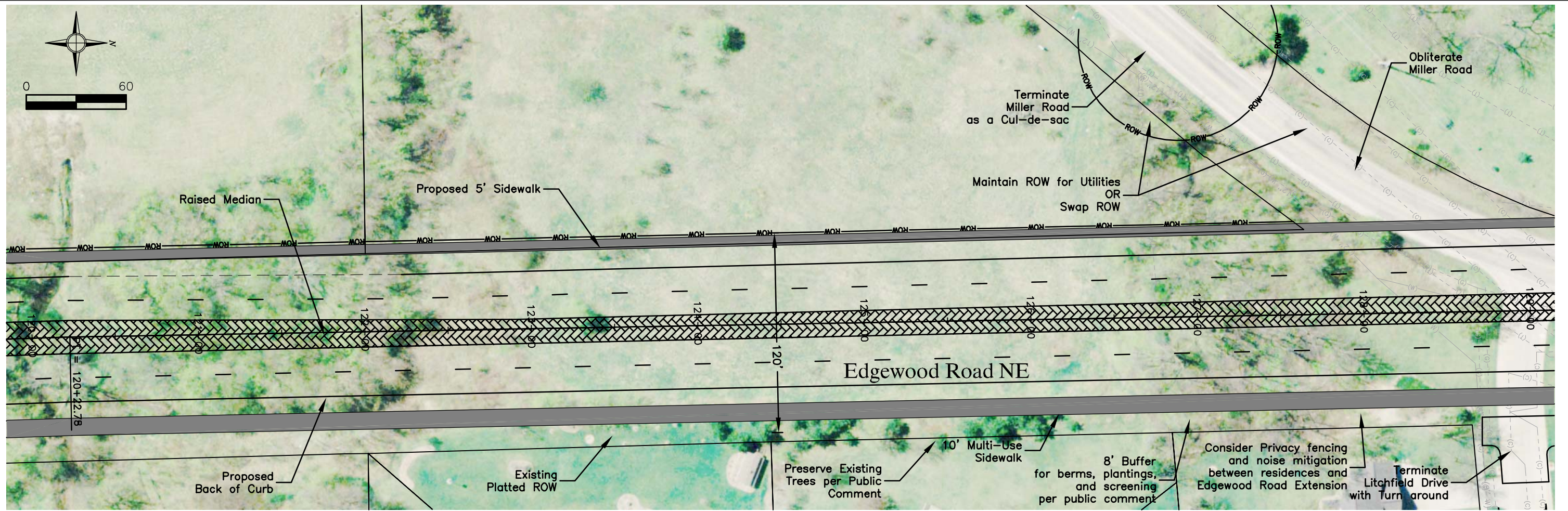
ANDERSON-BOGERT
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Preliminary Roadway and Intersection Design Study

Figure 10
Edgewood Road Extension
Plan & Profile


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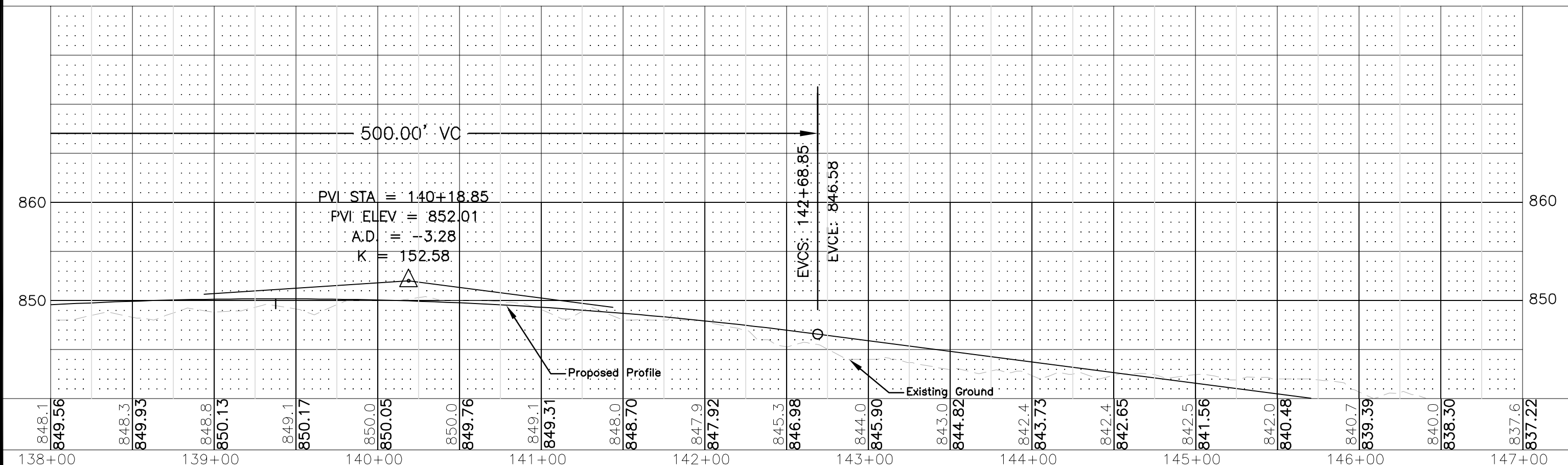
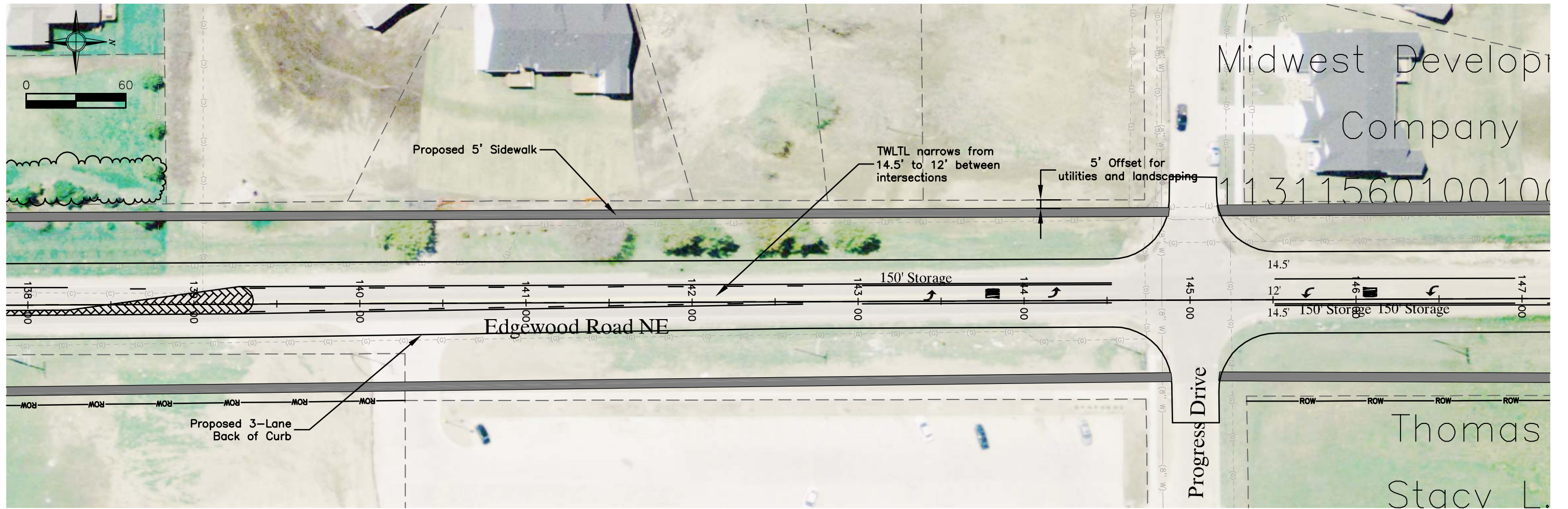
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Preliminary Roadway and Intersection Design Study

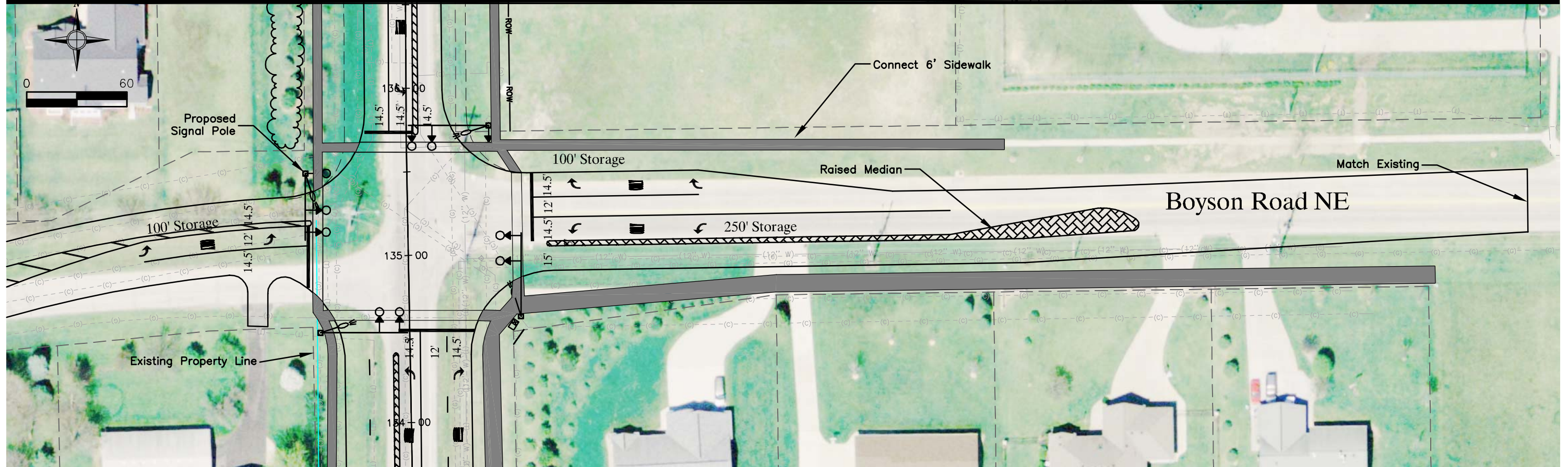
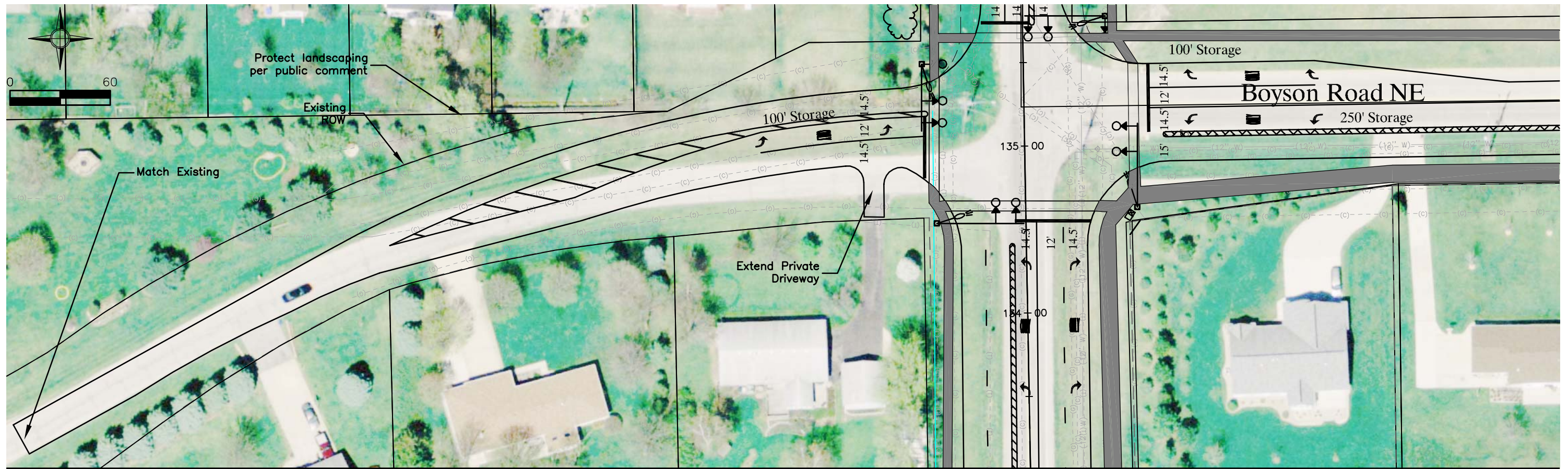
Figure 10
Edgewood Road Extension
Plan & Profile

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Preliminary Roadway and
Intersection Design Study

Figure 10
Boyson Road / Carpenter Road
Layout

SHEET NO.
IV-11
OF
IV-11

TABLE 1
EDGEWOOD ROAD EXTENSION
Blairs Ferry Road to Progress Drive
 ENGINEERS OPINION OF PROBABLE CONSTRUCTION COST (2007 DOLLARS)

ITEM NO.	ITEM	UNIT	QUANTITIES		Unit Price	Cost	
			Div 1	TOTAL		Division 1	TOTAL
1	MOBILIZATION	LS	1	1	\$ 125,000	\$ 125,000	\$ 125,000
2	TRAFFIC CONTROL	LS	1	1	\$ 50,000	\$ 50,000	\$ 50,000
3	REMOVAL OF EXISTING PAVEMENT, CURB & GUTTER, SIDEWALK	LS	1	1	\$ 50,000	\$ 50,000	\$ 50,000
4	CLEARING AND GRUBBING	LS	1	1	\$ 50,000	\$ 50,000	\$ 50,000
5	UNCLASSIFIED EXCAVATION AND EMBANKMENT	CY	35000	35000	\$ 4	\$ 140,000	\$ 140,000
6	MODIFIED SUBBASE 8"	TON	37000	37000	\$ 20	\$ 740,000	\$ 740,000
7	RETAINING WALLS	LS	1	1	\$ 75,000	\$ 75,000	\$ 75,000
8	PORTLAND CEMENT CONCRETE PAVEMENT 10" *	SY	72000	72000	\$ 35	\$2,520,000	\$ 2,520,000
9	PORTLAND CEMENT CONCRETE SIDEWALK	SY	10000	10000	\$ 25	\$ 250,000	\$ 250,000
10	PAVEMENT MARKINGS & SIGNING	LS	1	1	\$ 50,000	\$ 50,000	\$ 50,000
11	STORM SEWER PIPE	LF	5000	5000	\$ 75	\$ 375,000	\$ 375,000
12	STORM SEWER STRUCTURES	EA	50	50	\$ 3,000	\$ 150,000	\$ 150,000
13	DRAINAGE STRUCTURES	LS	1	1	\$ 175,000	\$ 175,000	\$ 175,000
14	SUBDRAIN	LF	15000	15000	\$ 4	\$ 60,000	\$ 60,000
15	SUBDRAIN CLEANOUTS	EA	25	25	\$ 1,250	\$ 31,250	\$ 31,250
16	TOPSOIL, SEEDING, & EROSION CONTROL	LS	1	1	\$ 50,000	\$ 50,000	\$ 50,000
17	TRAFFIC SIGNALS (Blairs Ferry Rd, Boyson Rd)	LS	1	1	\$ 350,000	\$ 350,000	\$ 350,000
18	LANDSCAPING/STREETSCAPING	LS	1	1	\$ 100,000	\$ 100,000	\$ 100,000

CONSTRUCTION SUBTOTAL
CONTINGENCY (20%)
ENGINEERING
GRAND TOTAL:

\$ 5,350,000
\$ 1,070,000
\$ 540,000
\$ 6,960,000

RIGHT OF WAY ACQUISITION (ACRE) 8.84
 * PCC Pavement quantity includes sidestreets and driveways

The horizontal and vertical alignment for this segment is based on a 40 mph design speed.

Edgewood Road and Blairs Ferry Road intersection will be reconstructed to include two through lanes, right turn lanes, and dual lefts on every leg. The intersection will be signalized with protected left turn phasing, and pedestrian crossings. The design is focused on protecting the operational integrity of the intersection. As such, no full access will be allowed within at least 600' of the intersection. Accesses near the intersection will become right-in right-out, three-quarters access, and/or be consolidated with other access points.

Public Meeting... Edgewood Road Extension alignment information was presented at an open house style public meeting on June 12th, 2007. Members of the public were invited to view different alternatives and talk with representatives from Corridor Metropolitan Planning Organization and the Consultant about the corridor. Comment sheets were distributed to those in attendance. 100 members of the public attended the open house (76 signed in).

Prevalent Comments (Provided by five or more attendees):

- Preserve existing mature trees as much as possible
- Landscaping/screening/berms should be included in the project
- Noise/sound control should be included in the project
- Privacy fencing between Edgewood Road corridor and established homes should be included in the project

Frequent Comments (Provided by two to four attendees):

- Concerned about speeds on Edgewood Road with respect to proximity of houses and children
- Concerns by Carpenter Road residents that Wolf Creek Trail cul-de-sac will increase traffic and speeds on Carpenter Road
- Concerns by Grey Wolf residents that Wolf Creek Trail cul-de-sac will increase traffic speeds on Grey Wolf
- Do no cul-de-sac Wolf Creek Trail – Keep connected to Edgewood Road

Other Comments:

- Do not disturb existing berm and landscaping at the east end of Wolf Creek Trail

- Cul-de-sac on Litchfield okay
- Move Wolf Creek Trail to the north and keep connected to Edgewood Road
- Connect Michael Drive to Grey Wolf as part of project to provide alternative access in and out of neighborhoods (rather than just Edgewood Road)
- Concern about concentrating traffic from Carpenter Road/Grey Wolf neighborhoods at only two intersections
- Realign Boyson Road to align with Wolf Creek Trail. Cul-de-sac Carpenter Road.
- An on-site walking meeting was held with Peck's. The roadway alignment and likely impacts to the Peck's property were discussed.

Peck's Nursery Comments:

Peck's Nursery will be impacted along the westerly side of its main property. The comments below are related to an on-site meeting with Peck's and discussion about possible impacts.

- Right-in/right-out access was not acceptable for the southerly entrance from Edgewood Road
- The location of full access at the northerly end of their property was what they wanted. Would like full access where right-in/right-out access is shown.
- Need to get customers in and out safely. Currently have signalized access.
- Sewer and water need to be extended as part of the roadway project.
- Concerned about street shown across cemetery property to back of Peck's loading area. Large retaining wall present.
- Want Edgewood Road access to property just north of cemetery on both sides of Edgewood Road.
- Want access drive from Blairs Ferry Road to the easterly part of their property.
- Pecks oriented their building for the main access to be southerly or directly westerly of their site. Concerned that customers coming in from the full access at the north end of their site will see the loading area at the back. Screening would be important.
- Will need fencing along the roadway and entrance gates to discourage theft after business hours.
- Do not want combined business and cemetery access.

Other Concerns:

- Cemetery access needs to be addressed as the cemetery expects to expand.
- Concerned about shared driveway shown off of Blairs Ferry Road. Want separate driveway access.

One issue from the public meeting and on multiple written comment sheets was the area around the Carpenter Road / Boyson Road / Wolf Creek Trail and Edgewood Road intersection. Most comments related to:

- Reconstruction of Boyson Road and Carpenter Road at Miller Road (future Edgewood Road) as a properly aligned signalized intersection
- The creation of a cul-de-sac at Wolf Creek Trail.

Currently, the intersections of Carpenter Road and Boyson Road do not lineup across Miller Road (see Figure 11). The plan at the Public Meeting showed Boyson Road / Carpenter Road connecting across Edgewood Road as a signalized intersection (refer back to Figure 10, pg. 9).

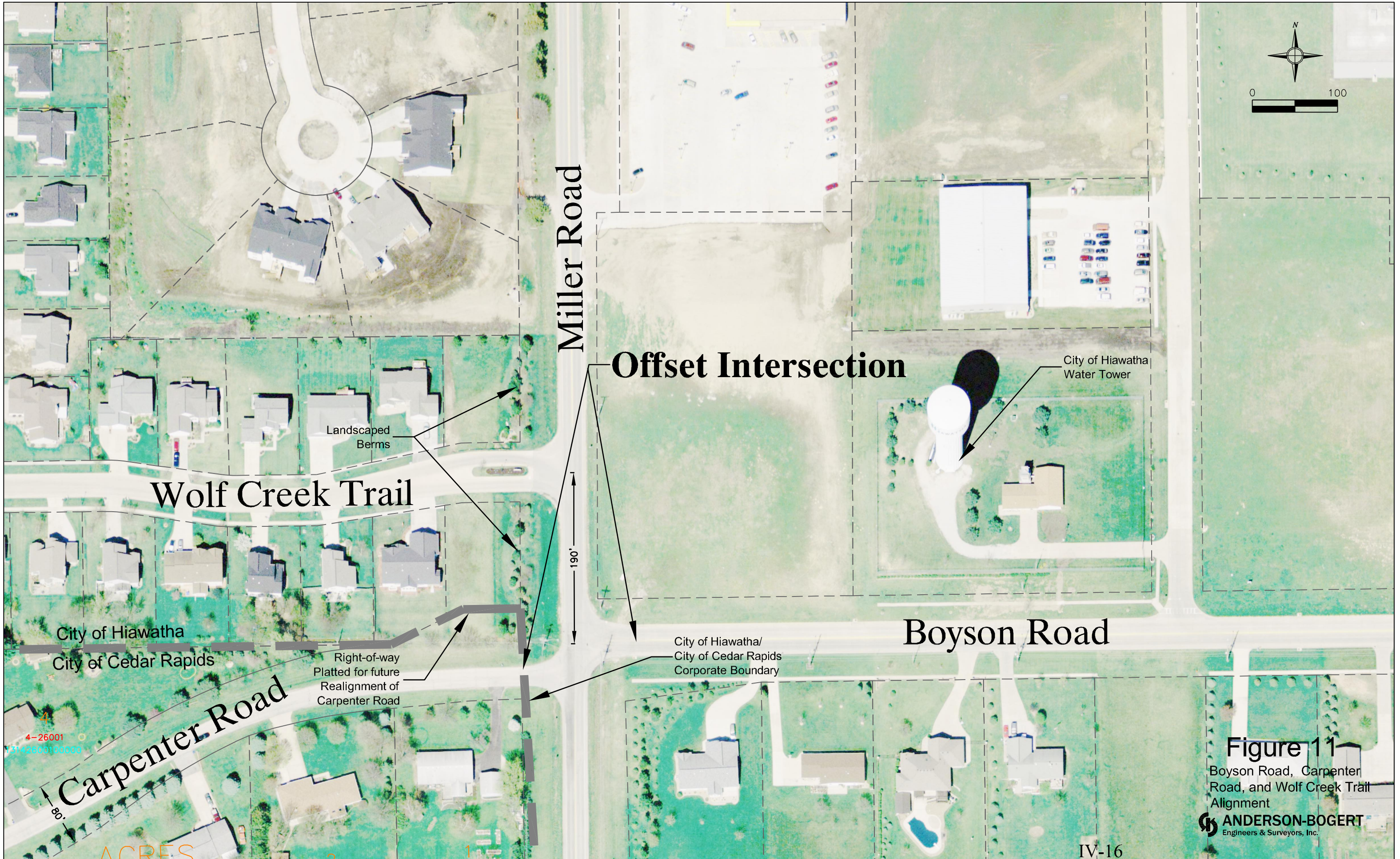
The suggestion to align Boyson Road and Wolf Creek Trail and cul-de-sac Carpenter Road was considered. See Figure 12 for a plan view of what the alignment might resemble.

Align Boyson Road with Wolf Creek Trail**Pros**

- Reduces traffic on Carpenter Road
- Preserves similar neighborhood as exists today

Cons

- Property Acquisition will be needed through a developable private lot.
- Negative impact to existing vacant lot north of Boyson Road – may have uneconomic remnant parcel of 0.8 acres.
- Significant additional costs associated with Boyson Road re-alignment (paving, ROW, utilities, etc.)
- Impacts to Water Department parcel – May no longer be suitable for water tower usage.
- Roadway within fall radius of water tower
- Possible DNR requirements for proximity to water wells on Water Department parcel (more study needed)



Miller Road

Offset Intersection

City of Hiawatha Water Tower

Wolf Creek Trail

Landscaped Berms

190'

City of Hiawatha
City of Cedar Rapids

Right-of-way
Platted for future
Realignment of
Carpenter Road

City of Hiawatha/
City of Cedar Rapids
Corporate Boundary

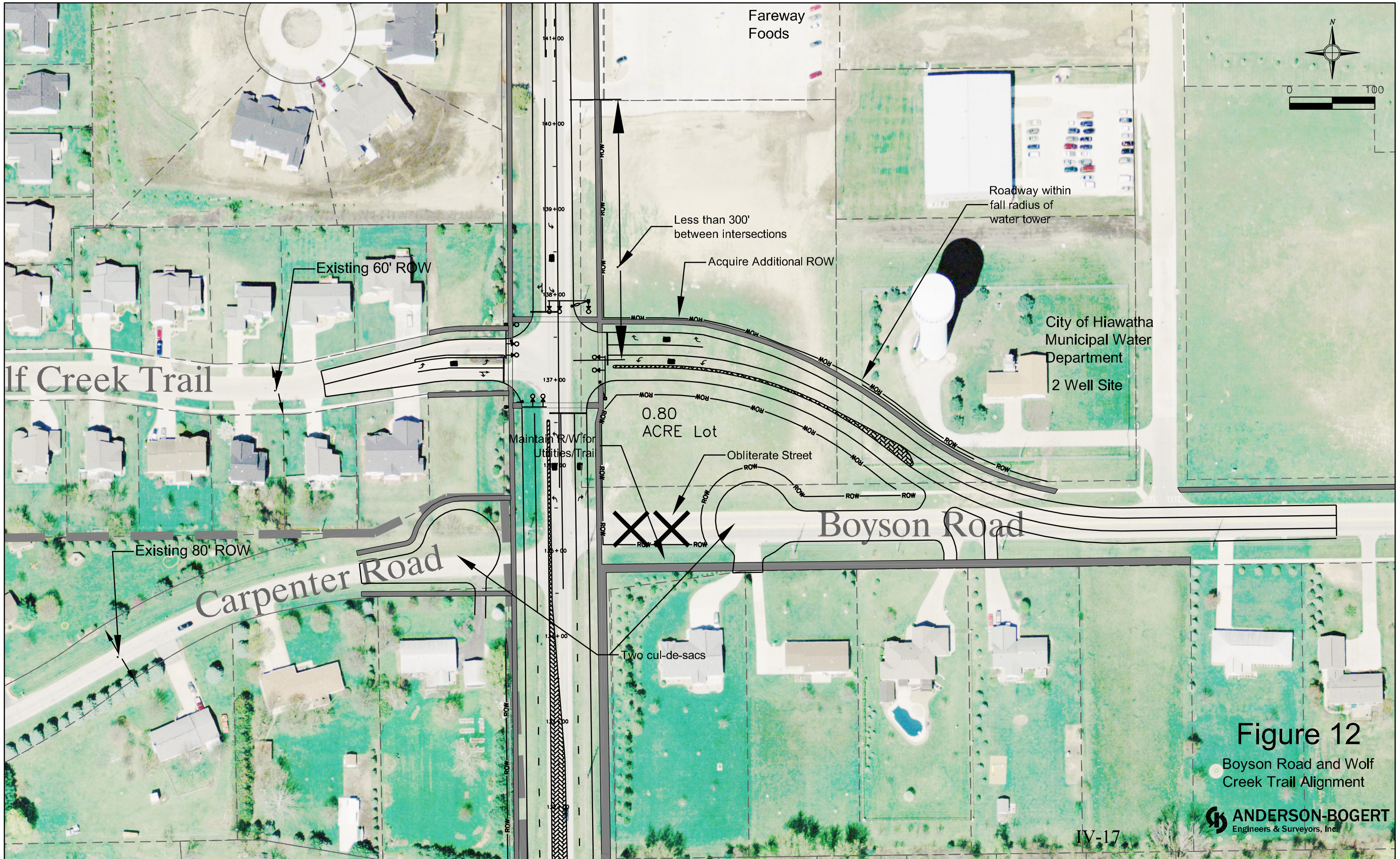
Boyson Road

Carpenter Road

Figure 11

Boyson Road, Carpenter Road, and Wolf Creek Trail Alignment

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Wolf Creek Trail

Existing 60' ROW

Existing 80' ROW

Carpenter Road

0.80 ACRE Lot

Boyson Road

Two cul-de-sacs

Fareway Foods

Less than 300' between intersections

Acquire Additional ROW

Roadway within fall radius of water tower

City of Hiawatha Municipal Water Department
2 Well Site

Maintain R/W for Utilities/Trail

Obliterate Street

Figure 12

Boyson Road and Wolf Creek Trail Alignment

- Carpenter Road has 80' ROW needed for a collector roadway Wolf Creek Trail only has 60' of ROW – insufficient for collector roadway, additional ROW would need to be acquired from numerous residential lots.
- Loss of on-street parking on Wolf Creek Trail
- Does not address or satisfy east-west travel demand
- Creates additional traffic on Wolf Creek Trail
- Two cul-de-sacs (one on Carpenter and one on Boyson) make snow removal, trash collection, and emergency services more difficult
- Fareway driveway is less than 300' from new Wolf Creek Trail intersection
- Access to Viola-Gibson school more restricted

The overwhelming number of cons makes re-alignment of Boyson Road with Wolf Creek Trail less attractive.

Consideration was also given to simply reconnecting Wolf Creek Trail to Edgewood Road Extension. Wolf Creek Trail and Carpenter Road intersections with Miller Road are only separated by 250'. The intersection of Wolf Creek Trail will be very close to the signalized intersection of Carpenter Road / Boyson Road and Edgewood Road.

Due to public comments about not making Wolf Creek Trail a cul-de-sac, consideration was made for Wolf Creek Trail to be connected at Edgewood Road as a right-in / right-out access. However, protecting the integrity of the Carpenter Road / Boyson Road and Edgewood Road intersection is important for safe and efficient operations. It is likely that during peak hours and possibly other busy times, access will be difficult.

North of Progress Drive the following two alignments were developed for the Edgewood Road Study Area.

- Loggerhead Road Alignment (east alignment) – Align with existing Loggerhead Road and Tower Terrace Road intersection.
- Miller Road Alignment (west alignment) – Align with existing Miller Road and Tower Terrace Road intersection.

The entire length of the Edgewood Road Extension the roadway will be centered in 120 ft of Right-of-Way. The road between Blairs Ferry Road and Boyson Road will have a width of 75' back of curb to back of curb. The posted speed will be 45 mph. A 6' sidewalk and 10' recreational trail (as shown in the Metro Area Trails Guide) will be built along Edgewood Road between Blairs Ferry Road and Boyson Road.

Between Boyson Road and where the Extension matches back into existing Loggerhead Road will have a width of 49' back of curb to back of curb. The posted speed for this section will also be 45 mph. 6' sidewalks will be built along both sides of Edgewood Road. The sidewalks will be built to accommodate the future 5-lane section.

Loggerhead Road Alignment (East Alignment or Alt. A) – Align with existing Loggerhead Road and Tower Terrace Road intersection.

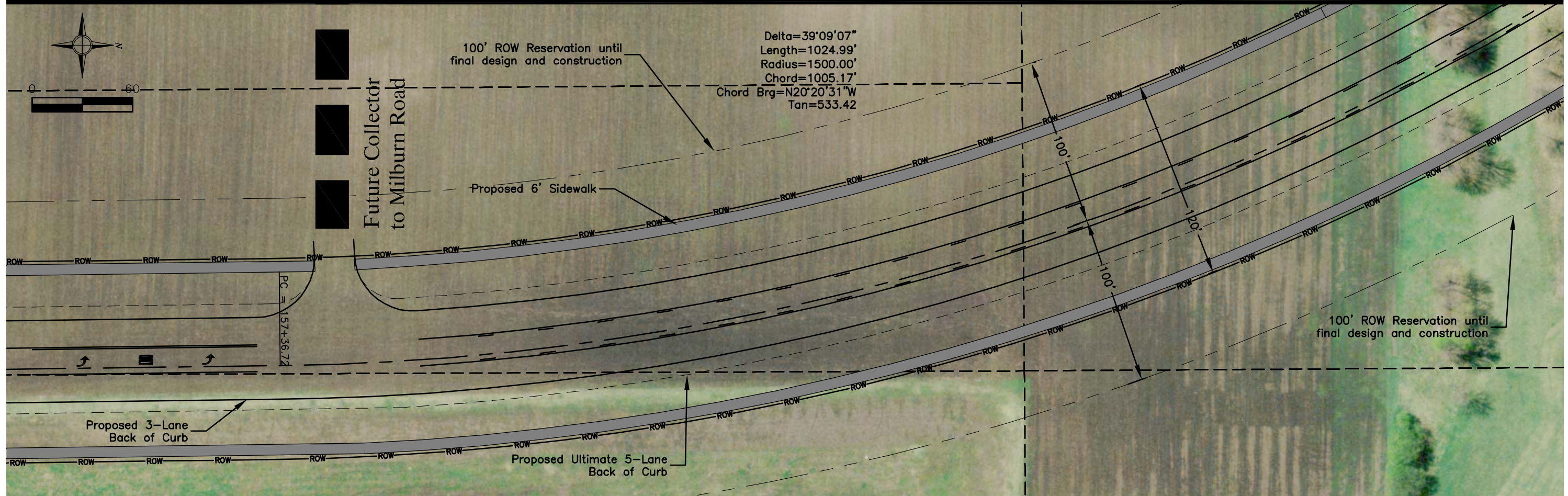
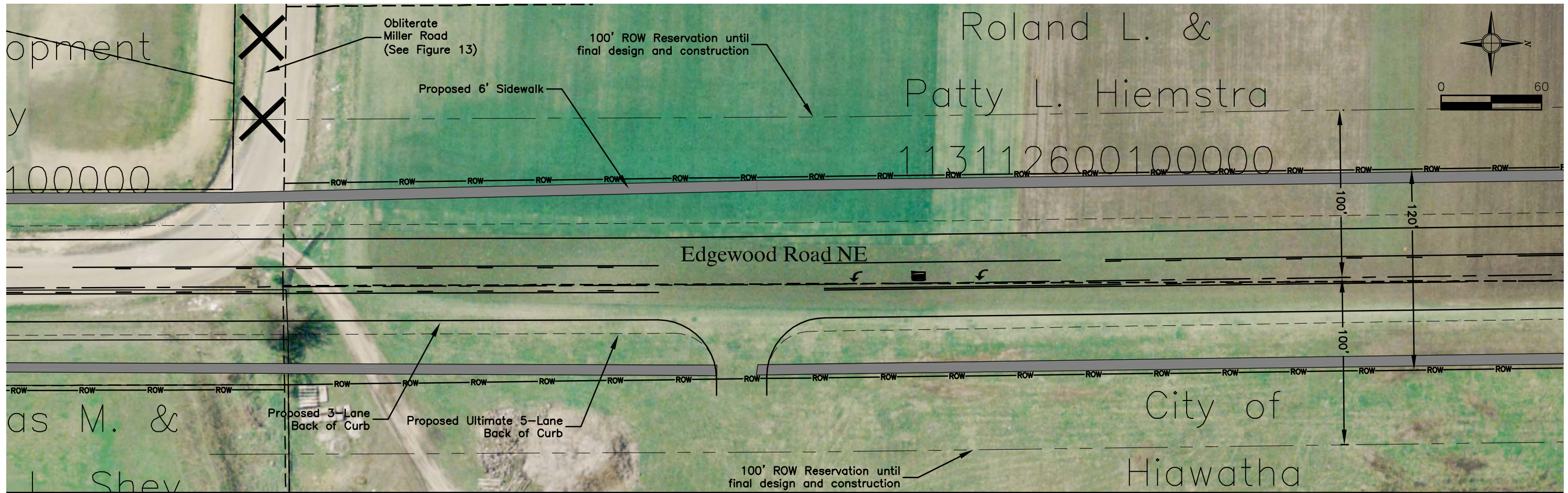
Figure 13 shows the proposed conceptual layout for Edgewood Road Extension. Because this roadway may be in place before significant development occurs, the design speed for this segment (north of progress drive) is 50 mph. Again, a 3-lane section is proposed with ultimate design accommodating a 5-lane section.

The design limits full access to 600' minimum spacing. The exact locations of full access are expected to vary slightly as land develops.

The Edgewood Road corridor eastern alignment starts at Progress Drive and ends at Loggerhead Road, north of Tower Terrace Road. The alignment is relatively close (680' separation) to the assumed future Tower Terrace Interchange west ramps.

An east-west portion of Miller Road (1300') will be abandoned and the roadway removed. Miller Road will be extended south to

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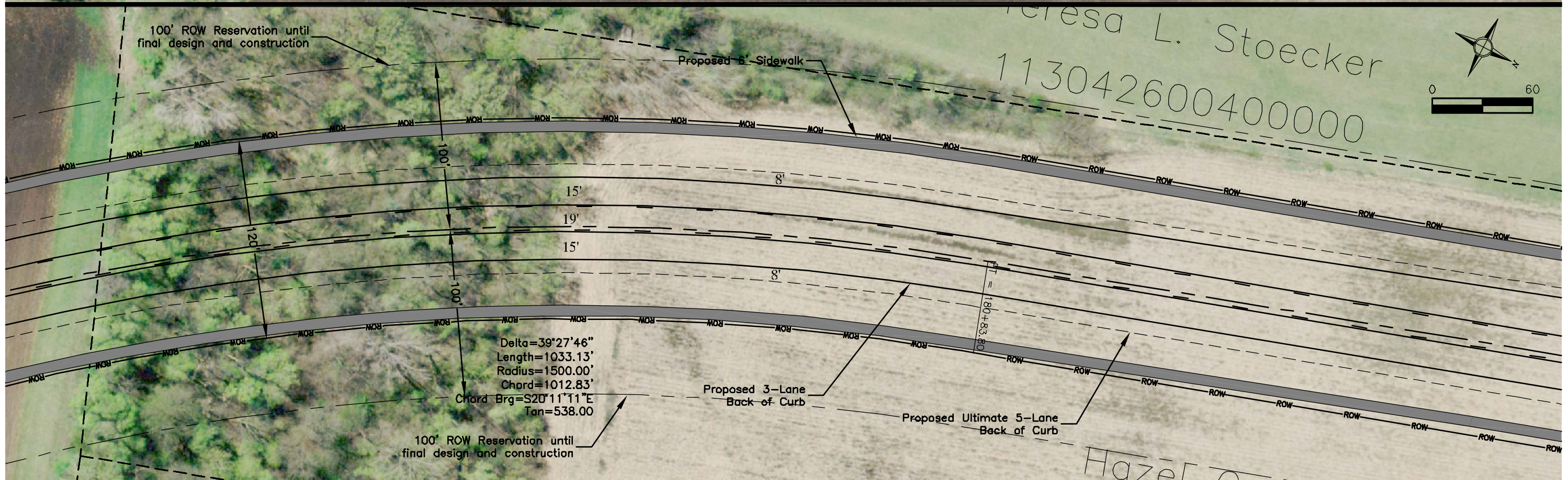
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Engineers & Surveyors, Inc.

Preliminary Roadway and Intersection Design Study

Figure 13
Loggerhead Road Alignment
(East Alignment)

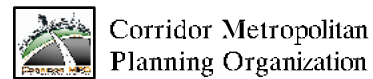
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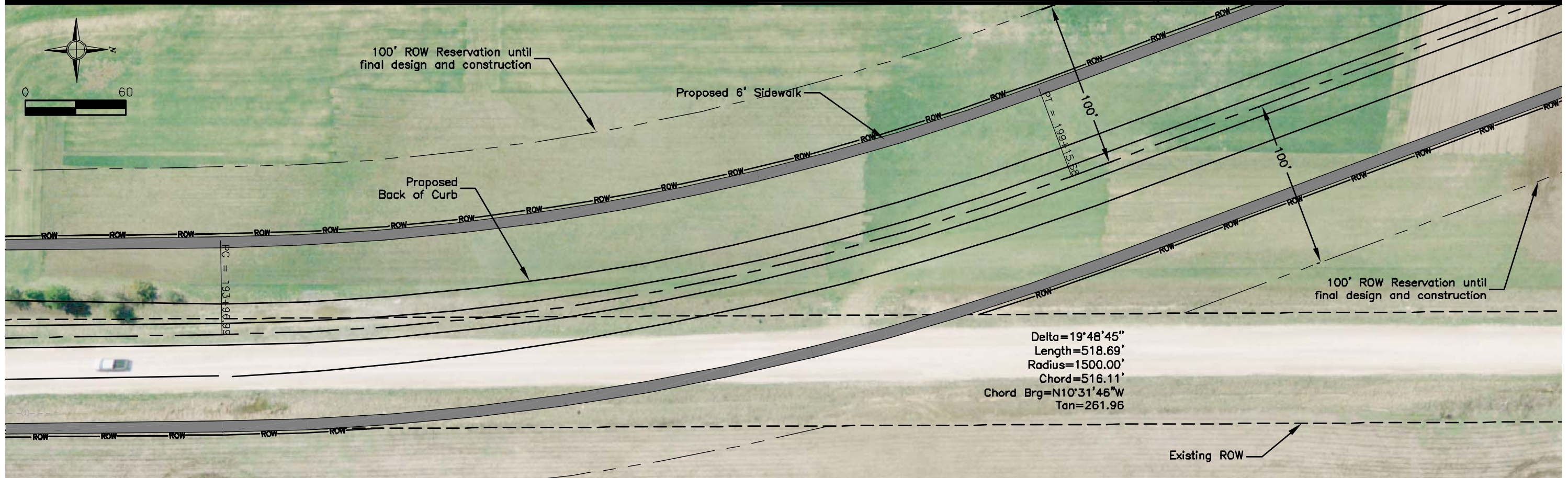
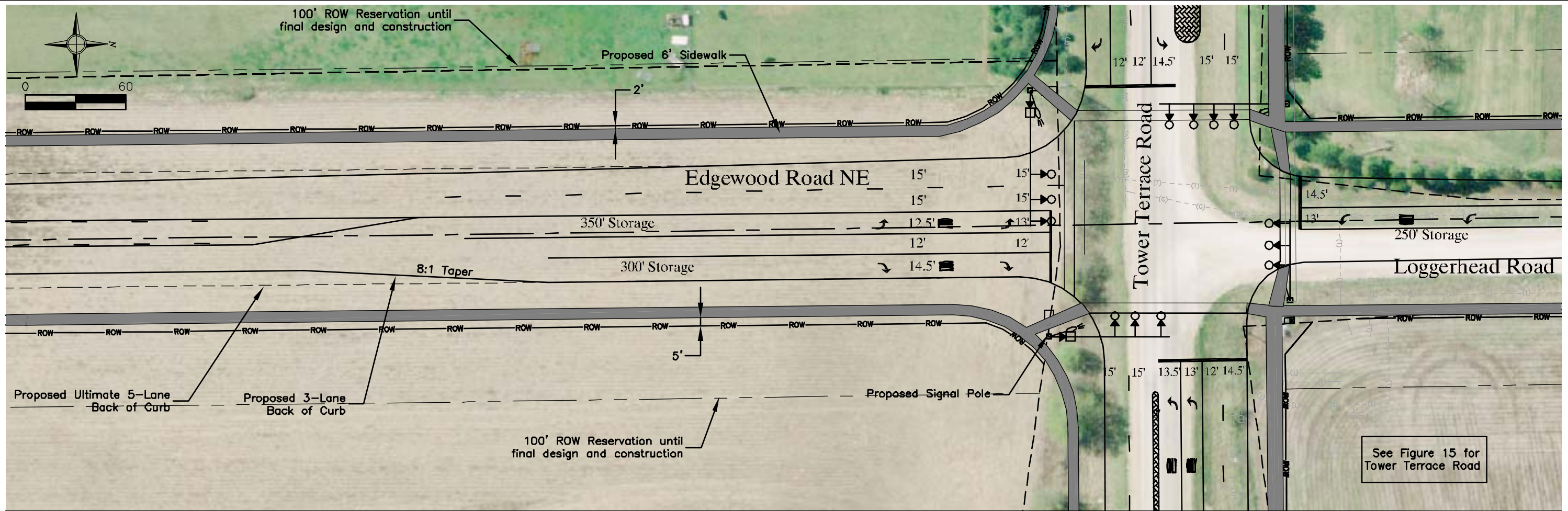


Preliminary Roadway and
Intersection Design Study

Figure 13
Loggerhead Road Alignment
(East Alignment)


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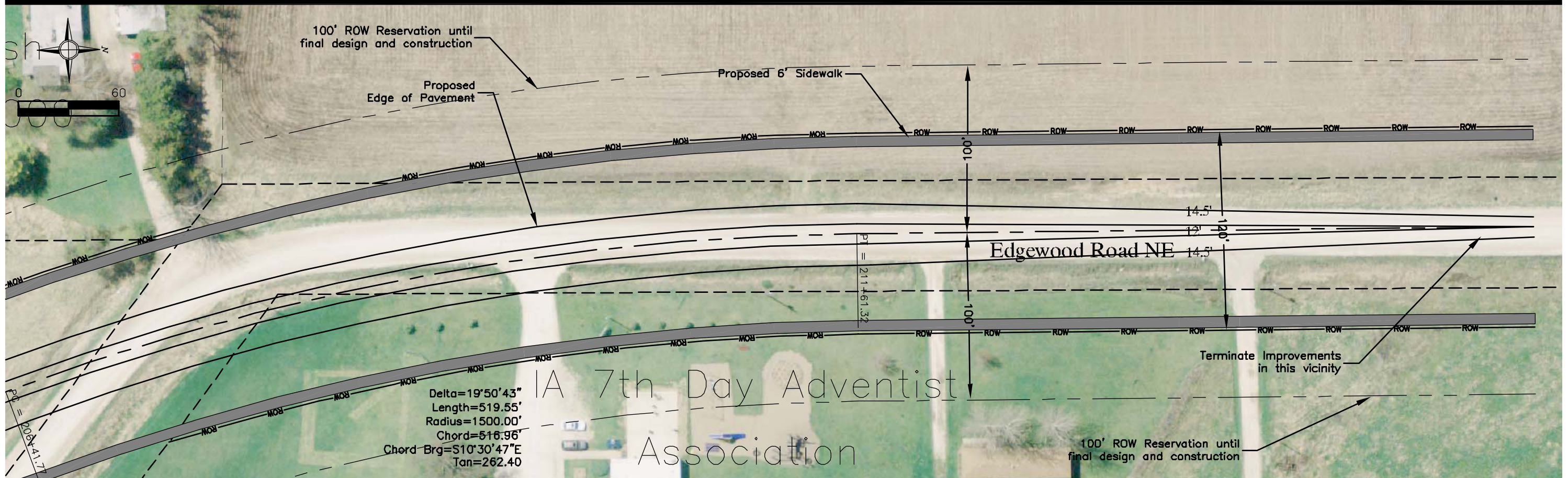
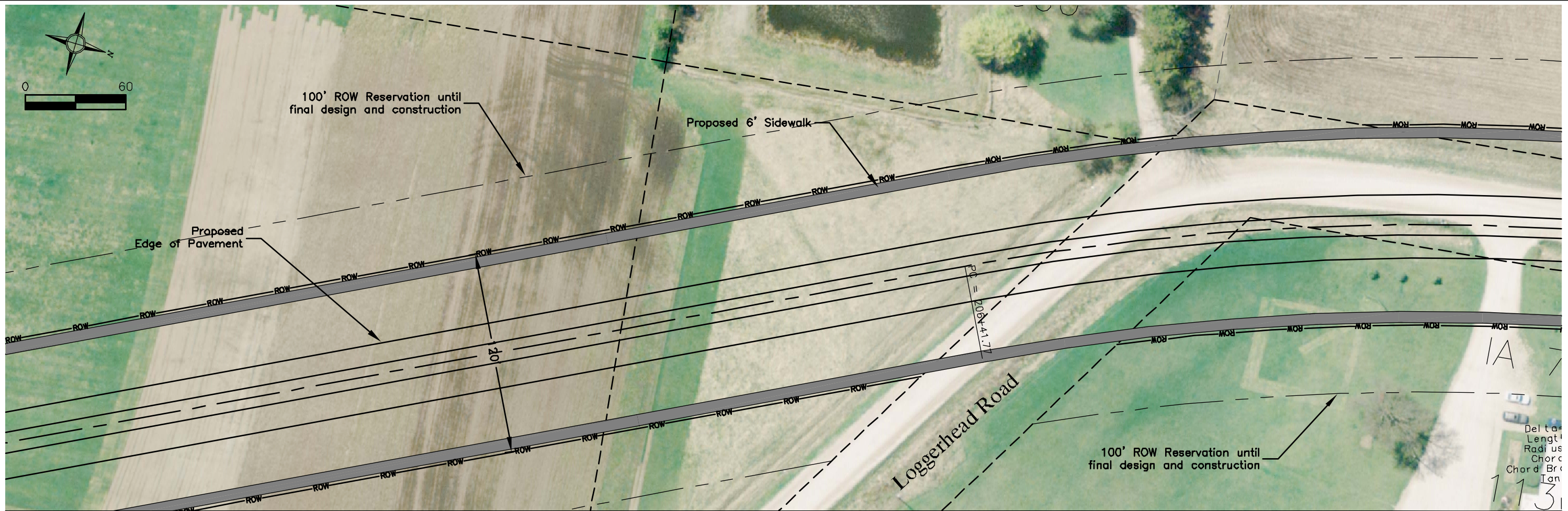
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Figure 13
 Loggerhead Road Alignment
 (East Alignment)

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Delta=19°50'43"
 Length=519.55'
 Radius=1500.00'
 Chord=516.96'
 Chord Brg=510°30'47"E
 Tan=262.40

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 LCRPC NO: 2006-01

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 APPROVED BY: JCM
 DATE:

 Corridor Metropolitan Planning Organization

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Figure 13
 Loggerhead Road Alignment
 (East Alignment)

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connect with Grey Wolf Drive as a T-intersection. The intersection of Miller Road and Tower Terrace Road will be eliminated and Miller Road will terminate as a Cul-de-sac.

The intersection with Tower Terrace Road and Edgewood Road will be signalized with two through lanes eastbound and westbound, one through lane northbound and southbound, dual lefts westbound, and left turn lanes for the other three legs. Right turn lanes will also be provided northbound and eastbound.

This Edgewood Road Extension alignment will require Right-of-Way acquisition on nine properties north of Progress Drive. The acquisitions will have varying impacts on the nine properties. Some acquisitions will require almost the entire parcel to be acquired and others will only require a minor part.

Loggerhead Road Right-of-Way will be utilized where the Edgewood Road Extension is shown to overlap.

Table 2 is a rough cost breakdown of construction and engineering for this alignment.

TABLE 2
EDGEWOOD ROAD EXTENSION
-Alternative A- (East Alignment)
Progress Drive to Project End

ENGINEERS OPINION OF PROBABLE CONSTRUCTION COST (2007 DOLLARS)

ITEM NO.	ITEM	UNIT	QUANTITIES		Unit		Cost		
			Div 1	TOTAL	Price	Division 1	TOTAL		
1	MOBILIZATION	LS	1	1	\$	100,000	\$	100,000	
2	TRAFFIC CONTROL	LS	1	1	\$	15,000	\$	15,000	
3	REMOVAL OF EXISTING PAVEMENT, CURB & GUTTER, SIDEWALK	LS	1	1	\$	10,000	\$	10,000	
4	CLEARING AND GRUBBING	LS	1	1	\$	50,000	\$	50,000	
5	UNCLASSIFIED EXCAVATION AND EMBANKMENT	CY	50000	50000	\$	4	\$	200,000	
6	MODIFIED SUBBASE 8"	TON	25000	25000	\$	20	\$	500,000	
7	RETAINING WALLS	LS	1	1	\$	15,000	\$	15,000	
8	PORTLAND CEMENT CONCRETE PAVEMENT 10" *	SY	50000	50000	\$	35	\$1,750,000	\$	1,750,000
9	PORTLAND CEMENT CONCRETE SIDEWALK	SY	12000	12000	\$	25	\$	300,000	
10	PAVEMENT MARKINGS & SIGNING	LS	1	1	\$	50,000	\$	50,000	
11	STORM SEWER PIPE	LF	8000	8000	\$	75	\$	600,000	
12	STORM SEWER STRUCTURES	EA	60	60	\$	3,000	\$	180,000	
13	DRAINAGE STRUCTURES	LS	1	1	\$	150,000	\$	150,000	
14	SUBDRAIN	LF	20000	20000	\$	5	\$	100,000	
15	SUBDRAIN CLEANOUTS	EA	35	35	\$	1,250	\$	43,750	
16	TOPSOIL, SEEDING, & EROSION CONTROL	LS	1	1	\$	50,000	\$	50,000	
17	TRAFFIC SIGNAL (Tower Terrace Rd)	LS	1	1	\$	175,000	\$	175,000	
18	LANDSCAPING/STREETSCAPING	LS	1	1	\$	100,000	\$	100,000	
19	FENCING	LS	1	1	\$	25,000	\$	25,000	

CONSTRUCTION SUBTOTAL
CONTINGENCY (20%)
ENGINEERING

\$ 4,390,000
\$ 880,000
\$ 440,000

GRAND TOTAL:

\$ 5,710,000

RIGHT OF WAY ACQUISITION (ACRE) 15.94

* PCC Pavement quantity includes sidewalks and driveways

Miller Road Alignment (West Alignment or Alt. B) – Align with existing Miller Road and Tower Terrace Road intersection.

Figure 15 shows the proposed conceptual layout for Edgewood Road Extension. Because this roadway may be in place before significant development occurs, the design speed for this segment (north of progress drive) is 50 mph. Again, a 3-lane section is proposed with ultimate design accommodating a 5-lane section.

The design limits full access to 600' minimum spacing. The exact locations of full access are expected to vary slightly as land develops.

The Edgewood Road corridor western alignment is between Boyson Road and ends on Loggerhead Road. The alignment is approximately 1180' separation from the future Tower Terrace Interchange west ramps.

The location of the intersection with Tower Terrace Road for this alignment is better for having least potential interaction with the Tower Terrace Interchange.

This alignment requires Right-of-Way acquisitions for 12 properties but utilizes some of the existing intersection Right-of-Way on north Miller Road. The alignment misses existing homes and attempts to minimize impacts to existing parcels as much as possible.

The Edgewood Road Extension on this alignment is better situated to use more existing Miller Road Right-of-Way. As in the east alignment, an east-west portion of Miller Road will be abandoned and the roadway removed. Miller Road will be extended south to connect with Grey Wolf Drive as a T-intersection (Refer to Figure 14). The intersection of Loggerhead Road and Tower Terrace Road will be eliminated. The portion of Loggerhead Road south and east of Edgewood Road will be abandoned and the roadway removed. Only a stub of Loggerhead Road will remain for private property access.

See Table 3 for the cost estimate of construction and engineering.



Miller Road

Edgewood Road Extension

City of Cedar Rapids

City of Hiawatha

Grey Wolf Drive

Wolf Run

Connect Miller Road with Grey Wolf Drive

Obliterate Road

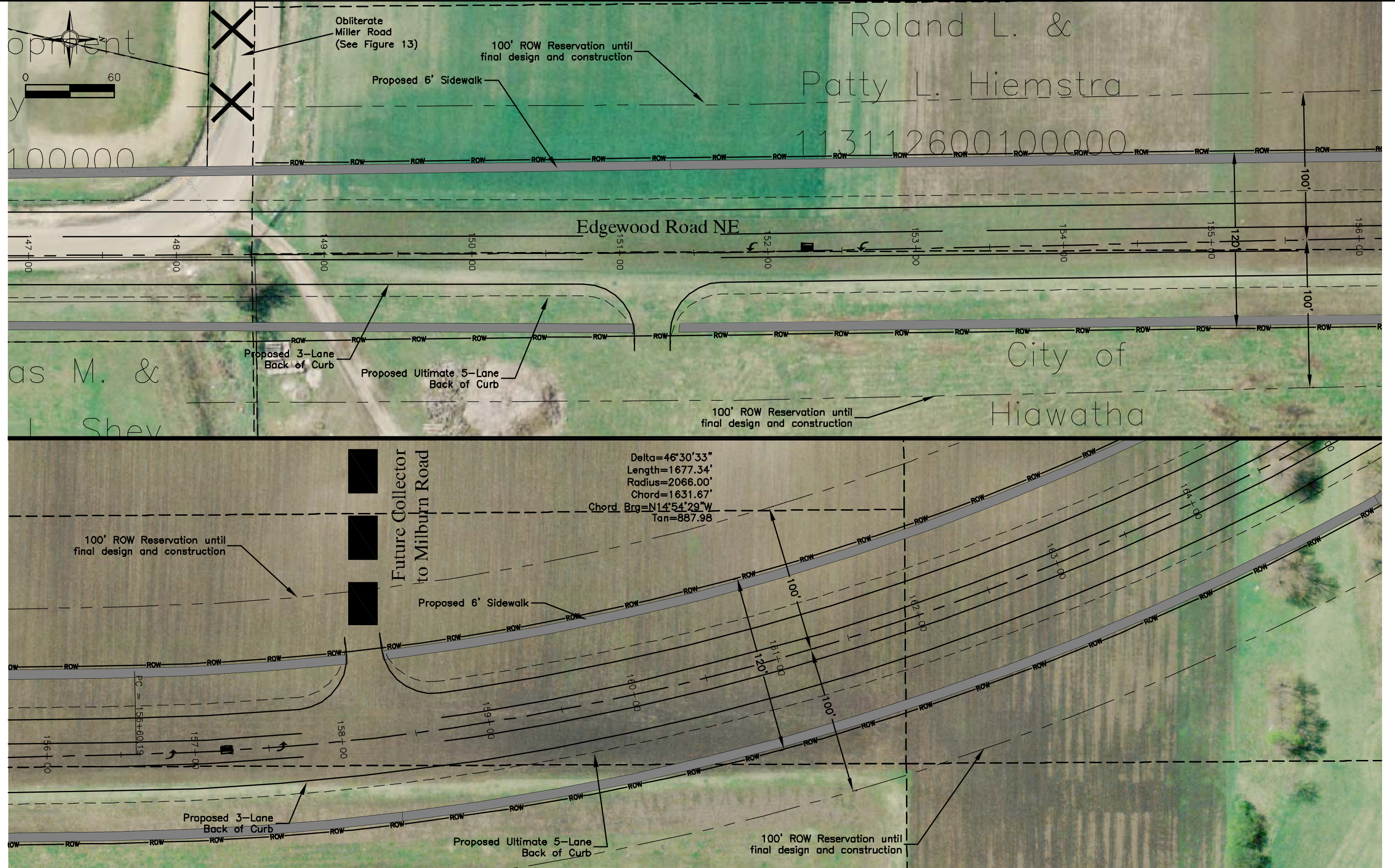
Maintain R/W for Utilities

Figure 14

Miller Road and Grey Wolf Drive


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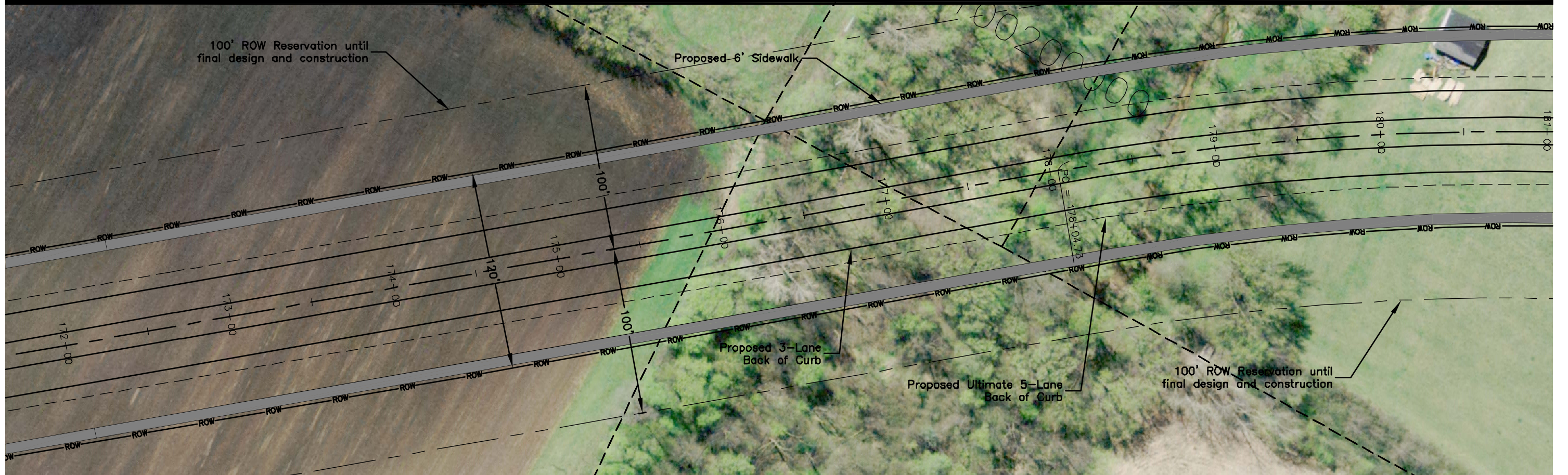
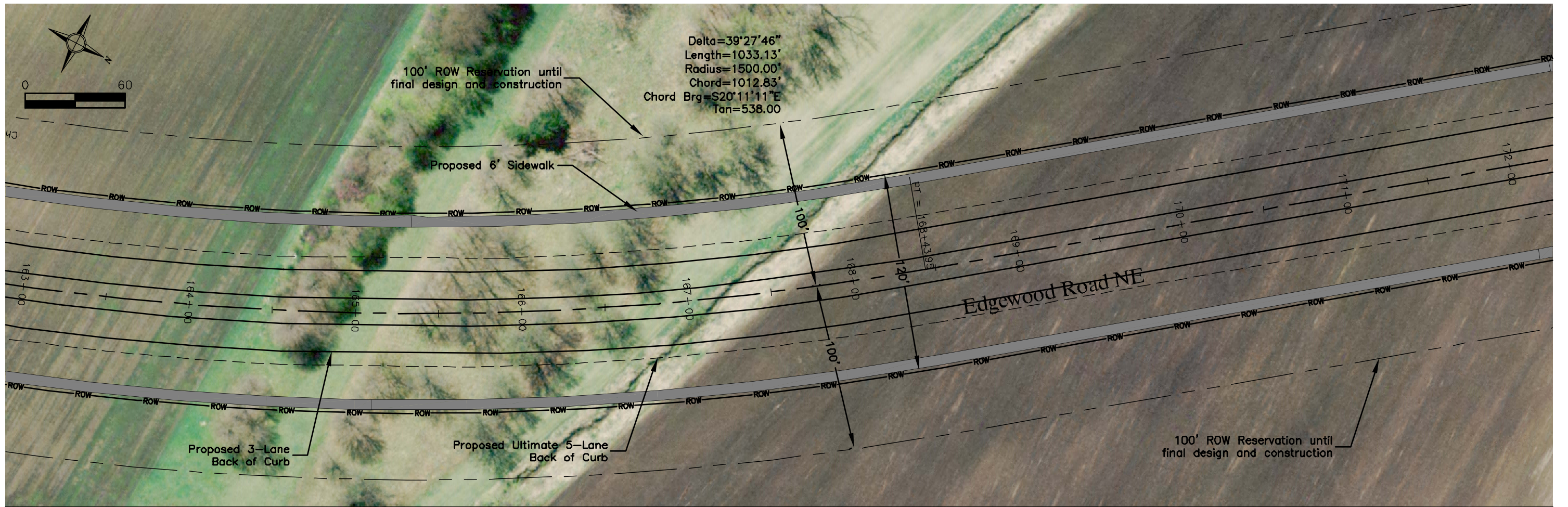
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Figure 15
Miller Road Alignment
(West Alignment)


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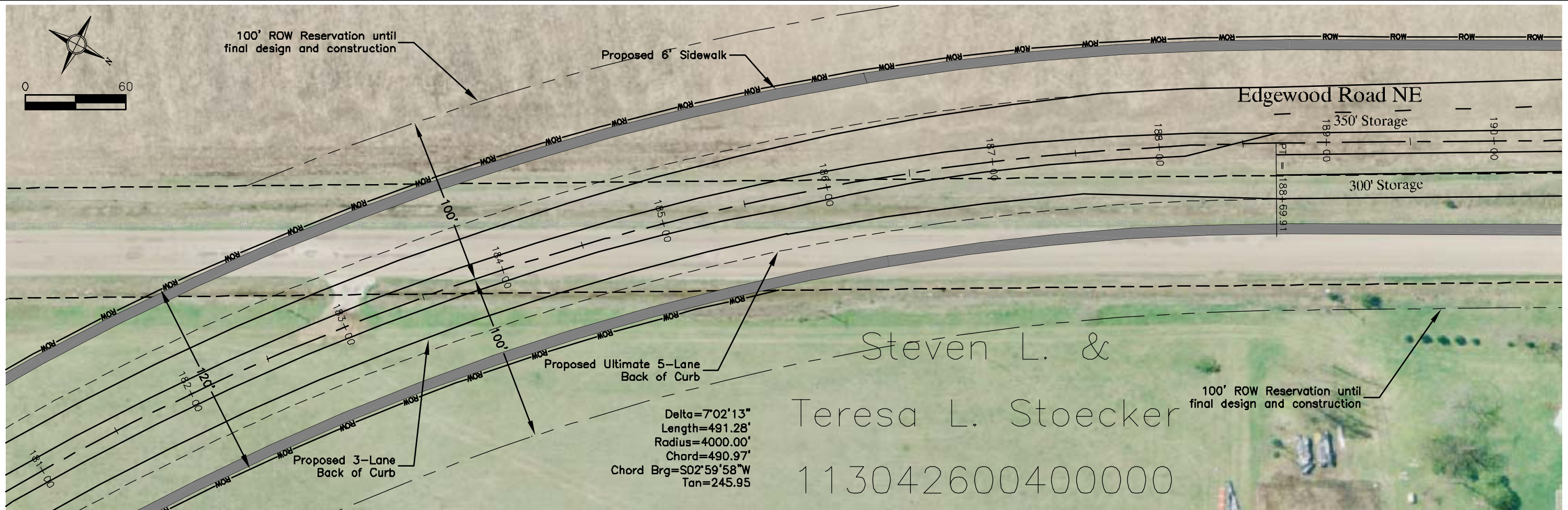
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Preliminary Roadway and Intersection Design Study

Figure 15
Miller Road Alignment
(West Alignment)


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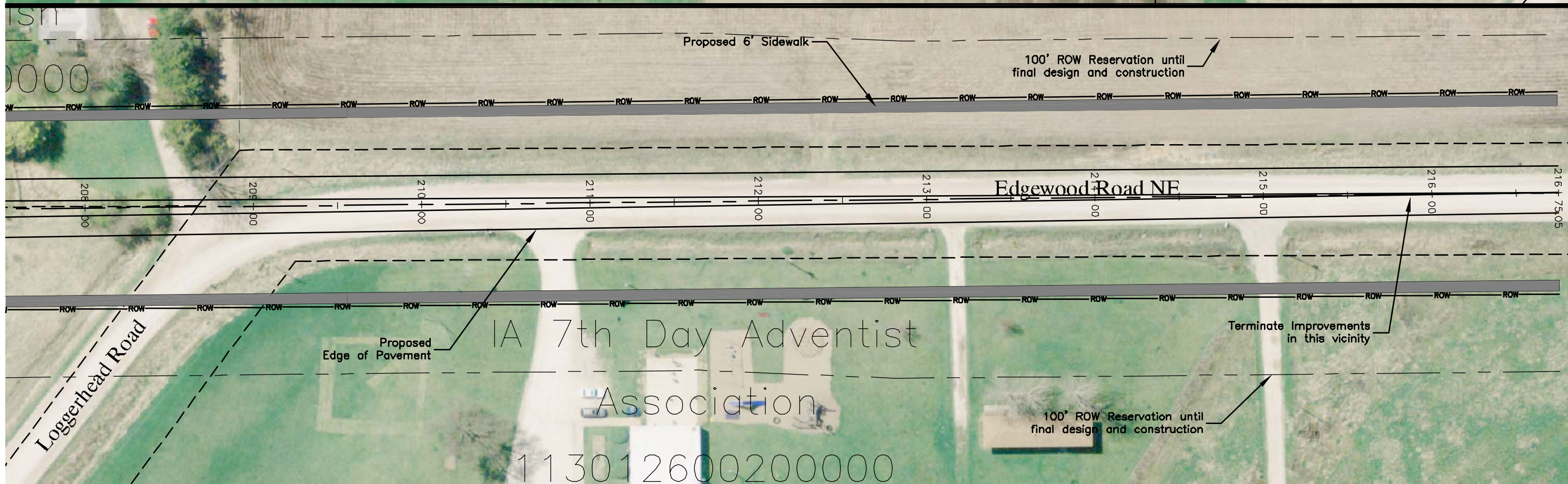
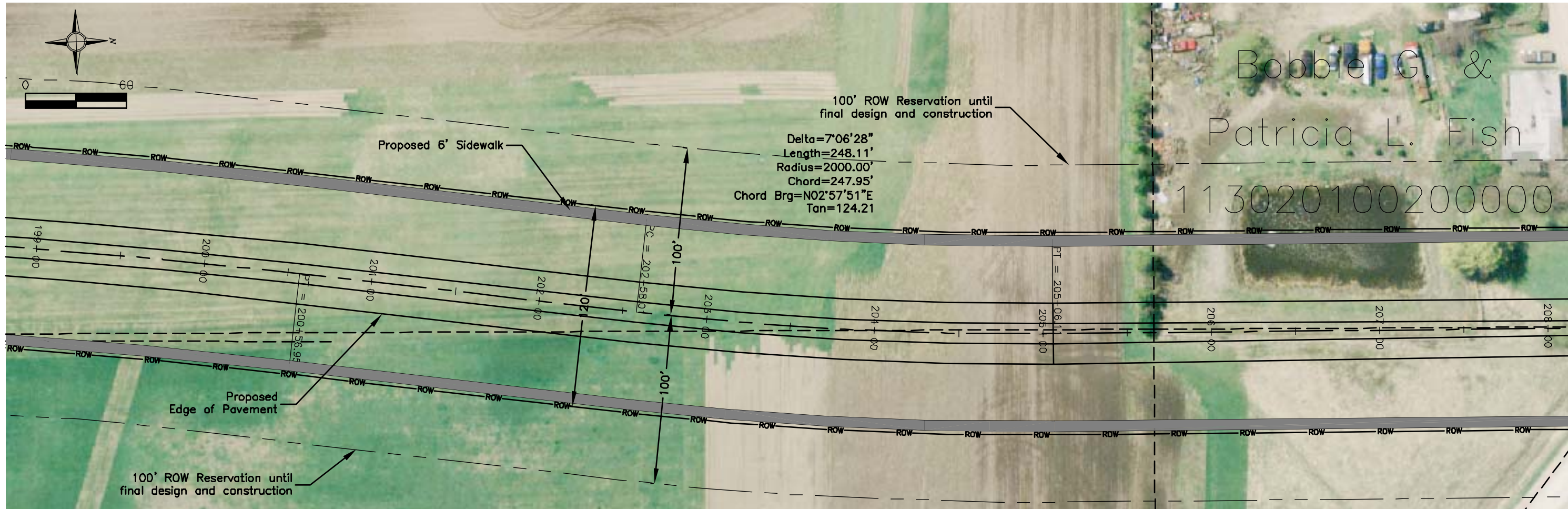
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Preliminary Roadway and Intersection Design Study

Figure 15
Miller Road Alignment
(West Alignment)

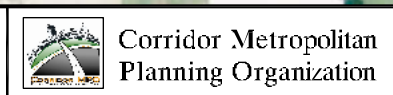
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LCRPC NO: 2006-01

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DATE:



Preliminary Roadway and Intersection Design Study

Figure 15
Miller Road Alignment
(West Alignment)

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OF
IV-31

TABLE 3
EDGEWOOD ROAD EXTENSION
-Alternative B- (West Alignment)
Progress Drive to Project End

ENGINEERS OPINION OF PROBABLE CONSTRUCTION COST (2007 DOLLARS)

ITEM NO.	ITEM	UNIT	QUANTITIES		Unit		Cost		
			Div 1	TOTAL	Price	Division 1	TOTAL		
1	MOBILIZATION	LS	1	1	\$	100,000	\$	100,000	
2	TRAFFIC CONTROL	LS	1	1	\$	15,000	\$	15,000	
3	REMOVAL OF EXISTING PAVEMENT, CURB & GUTTER, SIDEWALK	LS	1	1	\$	10,000	\$	10,000	
4	CLEARING AND GRUBBING	LS	1	1	\$	30,000	\$	30,000	
5	UNCLASSIFIED EXCAVATION AND EMBANKMENT	CY	36000	36000	\$	5	\$	180,000	
6	MODIFIED SUBBASE 8"	TON	27000	27000	\$	20	\$	540,000	
7	RETAINING WALLS	LS	1	1	\$	15,000	\$	15,000	
8	PORTLAND CEMENT CONCRETE PAVEMENT 10" *	SY	53000	53000	\$	35	\$1,855,000	\$	1,855,000
9	PORTLAND CEMENT CONCRETE SIDEWALK	SY	13000	13000	\$	25	\$	325,000	
10	PAVEMENT MARKINGS & SIGNING	LS	1	1	\$	50,000	\$	50,000	
11	STORM SEWER PIPE	LF	8000	8000	\$	75	\$	600,000	
12	STORM SEWER STRUCTURES	EA	60	60	\$	3,000	\$	180,000	
13	DRAINAGE STRUCTURES	LS	1	1	\$	150,000	\$	150,000	
14	SUBDRAIN	LF	20000	20000	\$	5	\$	100,000	
15	SUBDRAIN CLEANOUTS	EA	35	35	\$	1,250	\$	43,750	
16	TOPSOIL, SEEDING, & EROSION CONTROL	LS	1	1	\$	50,000	\$	50,000	
17	TRAFFIC SIGNAL (Tower Terrace Rd)	LS	1	1	\$	175,000	\$	175,000	
18	LANDSCAPING/STREETSCAPING	LS	1	1	\$	100,000	\$	100,000	
19	FENCING	LS	1	1	\$	25,000	\$	25,000	

CONSTRUCTION SUBTOTAL
CONTINGENCY (20%)
ENGINEERING

\$ 4,520,000
\$ 910,000
\$ 460,000

GRAND TOTAL:

\$ 5,890,000

RIGHT OF WAY ACQUISITION (ACRE) 16.49

* PCC Pavement quantity includes sidewalks and driveways

B. Preliminary Design Layout

Intersection capacity analyses were computed for two time horizons:

- Existing Conditions – Existing 2006 Traffic Volumes
- Future Conditions – Future 2026 Traffic Volumes

The analysis methods were based on the latest edition of the Highway Capacity Manual. Reported operational levels of Service (LOS), as defined by the Highway Capacity Manual, range from A (Best) to F (Worst). LOS A is typified by free, unimpeded traffic movement, while LOS F represents extreme congestion with long traffic queues.

Existing Conditions... Table 4 shows the three main intersections of interest in the Edgewood Road corridor.

- Edgewood Road and Blairs Ferry Road
- Miller Road (Future Edgewood Road) and Boyson Road
- Edgewood Road Extension and Tower Terrace Road (Alignments A and B)

Overall, all intersections operate at LOS C or better during both the A.M. and P.M. peak commuter periods. The only existing signalized intersection is Edgewood Road and Blairs Ferry Road. The almost 500 westbound to southbound left turning vehicles during the P.M. peak hour are delayed an average of 60 sec/veh or LOS E. Close behind is the northbound to westbound left with 600 left turning vehicles and delay of 53 sec/veh or LOS D.

Table 4. Existing Intersection LOS

Edgewood Road Extension			
	LOS	Delay	Longest Queue
Edgewood Road & Blairs Ferry			
Existing AM	B	18.2	326 (WBL)
Existing PM	C	25.9	567 (WBL)
Miller (Edgewood) & Boyson			
Existing AM	A	8.9	10 (WBT)
Existing PM	B	10.4	50 (WBT)
Miller (Edgewood) & Tower Terrace			
Existing AM	A	3.9	5 (WBL)
Existing PM	A	6.6	7 (EBL)

Total existing delay for the Edgewood Road and Blairs Ferry Road is over 7 hours of delay for the A.M. peak hour and 22.5 hours of delay for the P.M. peak hour.

Future 2026 Conditions... Table 5 shows the three main intersections of interest in 2026. The future 2026 conditions assume full 5-lane cross-section improvements from Blairs Ferry Road to Boyson Road and 3-lane cross-section improvements from Boyson Road to Tower Terrace Road. All intersections operate at LOS C or better for the A.M. and P.M. peak commuter periods, except for the LOS D for Edgewood Road and Blairs Ferry Road in the A.M. peak. Edgewood Road operates better than existing even with more traffic because of the increased number of lanes.

Table 5. Future Intersection LOS

Edgewood Road Extension			
	LOS	Delay	Longest Queue
Edgewood Road & Blairs Ferry			
2026 AM	D	51.5	660 (EBR)
2026 PM	C	33.7	367 (EBR)
Miller (Edgewood) & Boyson			
2026 AM	B	12.8	338 (NBT)
2026 PM	B	6.7	206 (NBT)
Miller (Edgewood) & Tower Terrace			
2026 AM	C	32.9	406 (NBR)
2026 PM	C	24	355 (WBL)

Comparison of Concepts... Both alignment alternatives north of Progress Drive were competitively evaluated based on:

- Development impact
- Impacts to adjacent properties,
- Interaction with the Tower Terrace Interchange
- Environmental
- Compatibility with the long range plan
- Favorable public input.

The alternatives were scored using a scale of 1 to 2 with 1 being the best. The lowest composite score is the most preferred alignment. Table 6 shows the results of the comparison.

Table 6. Competitive Alternatives Comparison

Comparison Criteria							
Alternative	Development Impact	Impacts to Adjacent Properties	Interaction with Tower Terrace Interchange	Environmental	Long Range Plan	Public Input	Composite
A. Align with Loggerhead Road	2	1 8 Properties	2	1	1	2	9
B. Align with Miller Road	1	2 12 Properties	1	1	1	1	7

V. CONCLUSIONS AND RECOMMENDATIONS

Based on the previous discussions and analyses the following recommendations were developed:

- The Edgewood Road Extension should be constructed in two stages
 - Stage 1: 5-Lane Section from Blairs Ferry Road to Boyson Road and a 3-Lane Section from Boyson Road to tie into Loggerhead Road.
 - Stage 2: In the future when volumes justify, finish from Boyson Road to Loggerhead Road to complete the 5-Lane Section.
- Select the Miller Road Alignment (West Alignment or Alt. B) for Edgewood Road Extension from Progress Drive to Tower Terrace Road (Refer to Figure 15).
- Protect the integrity of the Edgewood Road intersection with Blairs Ferry Road by limiting access within the expected queuing areas of the intersection (Refer to Figure 10).
- Access points along Edgewood Road should be based on proposed land use, traffic generations, and City requirements.
- Realign Carpenter Road to line up with Boyson Road (Refer to Figure 10).
- Connect Wolf Creek Trail in as a Right-in / Right-out with no direct left turn access to the Edgewood Road Extension (Refer to Figure 10). Extend Miller Road to connect with Grey Wolf Drive (Refer to Figure 14).
- Consider walls, alignment adjustments, steeper grading in local spots to save trees, per public comment.
- Design and construct Edgewood Road Extension to avoid significant impacts to the Monroe Township Cemetery (Buffalo Cemetery) (Refer to Figure 5 and 10).
- Include a significant screening, noise mitigation, and landscaping plan with the project plan development, per public comment.
- As platting and development continues in the corridor, require 100' wide right-of-way reservations on each side of the proposed alignment (Figures 10 and 15) to provide a 200' wide swath. This reservation should remain in effect until the detailed design of the roadway is completed and final alignments are set. No permanent private improvements should be allowed in the reservation until the final right-of-way and easement limits are determined.