Great Lakes Water Supply Program

GREAT WATER ALLIANCE

DRAFT

3-140 D2A Waukesha Great Lakes Water Supply Program WDNR Supplemental Environmental Impact Report - Route Alternative Descriptions

June 2018

Waukesha Water Utility
SERVING WAUKESHA SINCE 1886

GREELEY AND HANSEN

Route Descriptions

The following descriptions are narratives describing the general surroundings, land uses, potential trenchless installation methods, and preliminary horizontal alignments for Oak Creek Route Alternatives 2, 3, and 4. Narratives are also included for the Alternate Supply Route and Alternate Supply Route Sub-Alternative. The descriptions reference the Route Alternative Panels only for Route Alternatives 2, 3 and 4, providing additional visual geographical identification.

ROUTE ALTERNATIVE 2

Water Supply Pipeline Route Description (Route Alternative 2)

The narrative for the preliminary Water Supply and Return Flow Pipeline alignments of Route Alternative 2 is presented below following the flow path, beginning at the Water Supply Pipeline connection to Oak Creek and ending at the connection to the Waukesha Water Utility (WWU) distribution system. The pipeline route then follows the flow path along the Return Flow Pipeline, beginning at the Clean Water Plant (CWP) and ending at the Root River outfall. Segments that are either in multiple routes or within the Common Corridor on a singular route are only described once at the segment or panel that first occurs per the direction of flow. Note that Common Corridor refers to corridors containing both the Water Supply and Return Flow Pipelines. Panels 4 and 32 are instances where the Water Supply Pipelines either converge into or diverge from the Common Corridor, thus there is overlap of descriptions of the pipelines in these panels. The description provides the rationale for the preliminary horizontal alignment. The photos provided for visual reference are numbered from east to west, south to north, and by time of year taken, starting at Oak Creek. Refer to the Route Alternative Panels, bound separately, for panels of the preliminary horizontal alignments for the route alternatives.

Ryan Road Segment (Cities of Oak Creek and Franklin)

Panel 1 in the Route Alternative Panels displays the beginning of the Route Alternative 2 Water Supply Pipeline. Ryan Road is a six-lane, two-way divided road for the first 2,300 feet. At 27th Street, Ryan Road transitions into a four-lane, two-way divided roadway. The land use around the route in Panel 1 is rural, with light commercial and residential areas. The total length of the Water Supply Pipeline within Panel 1 is approximately 3,000 feet. See Photos 1 through 5 for reference.

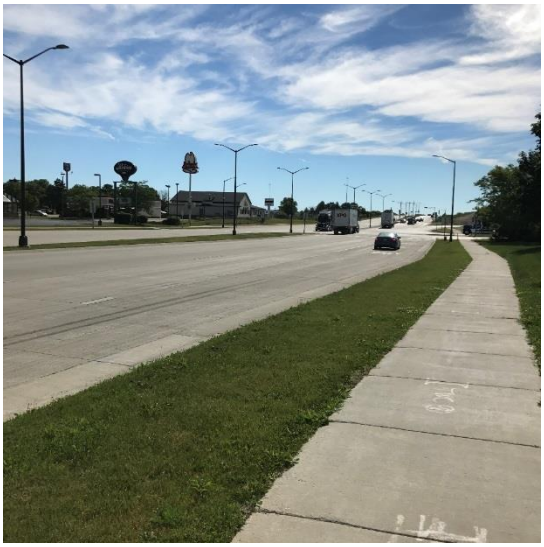

Photo 1
Looking Eastbound along Ryan Road near 22nd Street

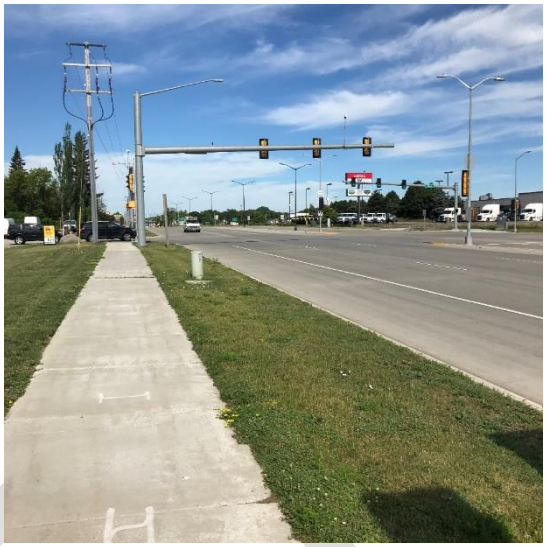

Photo 2
Looking Westbound along Ryan Road near 22nd Street

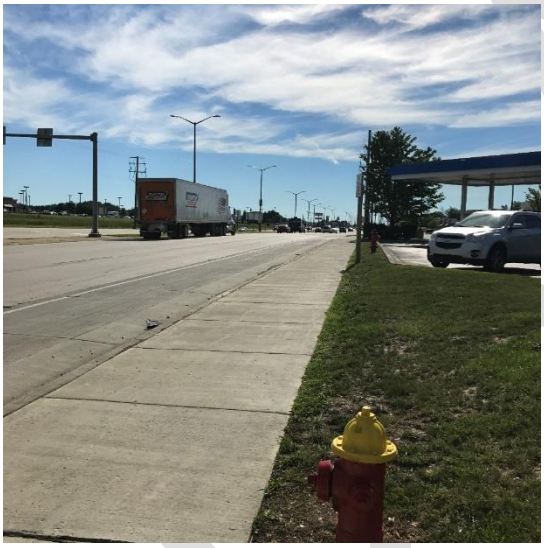

Photo 3

Looking Eastbound along Ryan Road at 27th Street

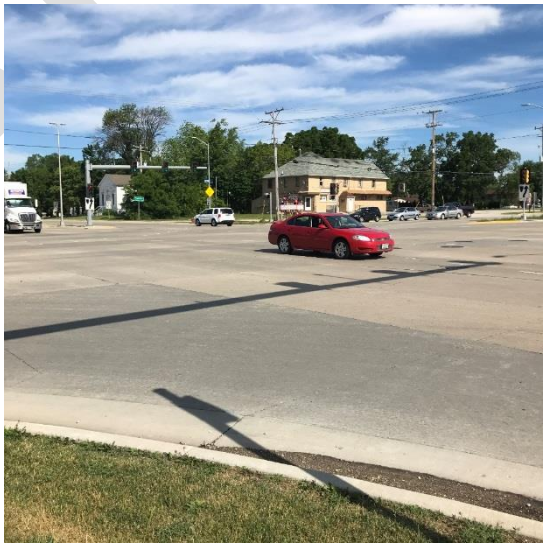

Photo 4

Looking at the intersection of Ryan Road and 27th Street

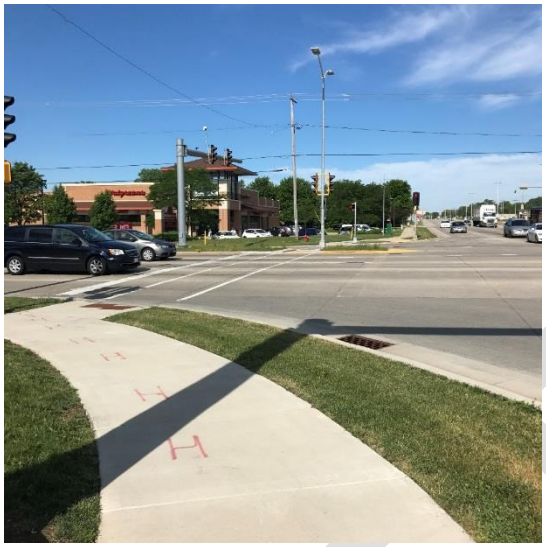

Photo 5

Looking Westbound along Ryan Road at 27th Street

Panel 2 in the Route Alternative Panels continues from the west end of Panel 1 at approximately 200 feet east of the intersection of Ryan Road and 31st Street. As shown in this panel, Ryan Road is a four-lane, two-way road. The land use around the route in Panel 2 is primarily rural, with residential areas and light commercial areas. Approximately 750 feet to the west of the intersection of Ryan Road and 35th Street, a trenchless construction method of horizontal directional drill (HDD) is being considered to install 350 linear feet of pipeline. This construction method is being considered to minimize impacts to the Oak Creek waterway. The total length of the Water Supply Pipeline within Panel 2 is approximately 3,500 feet. See Photos 8 through 10 for visual reference.

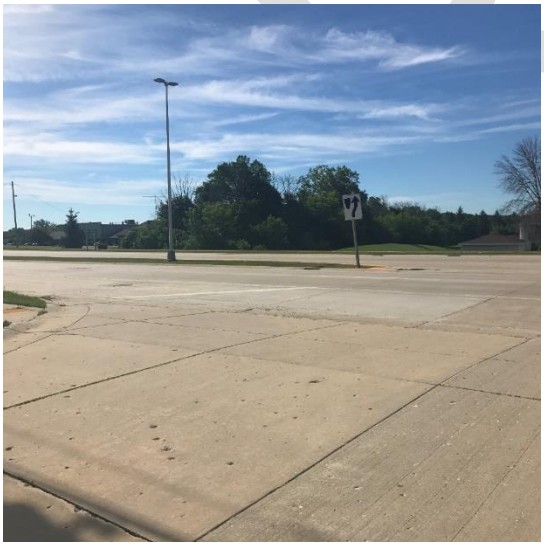

Photo 8

Looking Westbound along Ryan Road

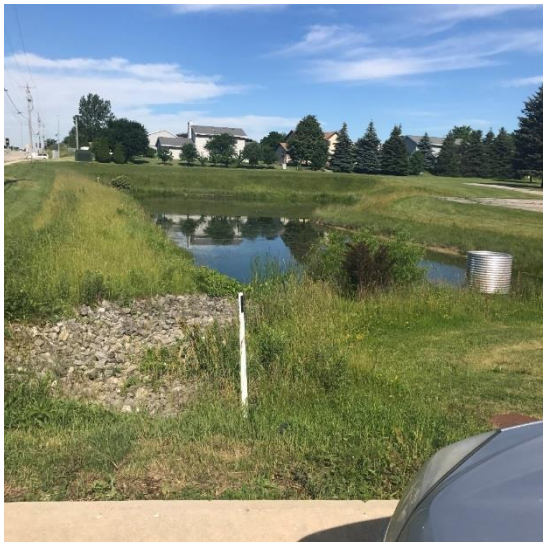

Photo 9

Looking Westbound along Ryan Road

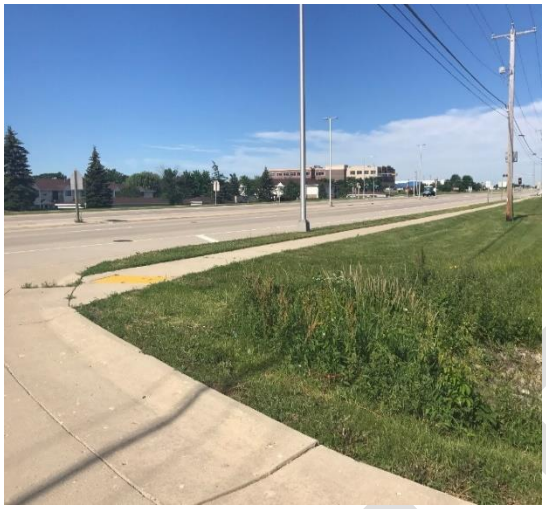

Photo 10

Looking Eastbound along Ryan Road

Panel 3 in the Route Alternative Panels continues from the west end of Panel 2 at approximately 900 feet east of the intersection of Ryan Road and Oakwood Park Drive. As shown in this panel, Ryan Road is a four-lane, two-way roadway. The land use around the route in Panel 3 is rural, with light industrial and residential areas. Approximately 100 feet prior to the intersection of Ryan Road and Franklin Drive (seen on the west end of Panel 3 and the east end of Panel 4), a jack and bore method is being considered to install approximately 270 linear feet of pipe casing. This construction method is being considered to minimize traffic disruption at Franklin Drive. The total length of the Water Supply Pipeline within Panel 3 is approximately 3,500 feet.

Panel 4 in the Route Alternative Panels continues from the west end of Panel 3 at approximately 50 feet east of the intersection of Ryan Road and Franklin Drive. As shown in this panel, Ryan Road is a four-lane, two-way roadway. The land use around the route in Panel 4 is primarily rural, with residential, commercial, and industrial areas. At the southwest corner of the intersection of Ryan Road and 60th Street, the Water Supply and Return Flow Pipelines converge and the Common Corridor begins. Approximately 50 feet west of the intersection of Ryan Road and 60th Street, a trenchless construction method of HDD is being considered to install approximately 1,400 feet of the pipelines to bypass underneath the Root River (seen on the west end of Panel 4 and the east end of Panel 5). The total length of the Water Supply Pipeline within Panel 4 is approximately 3,500 feet. See Photos 11, 12, 18 and 19 for visual reference.

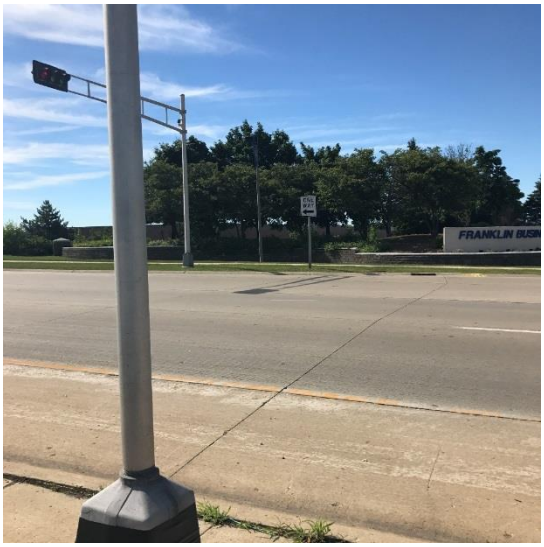

Photo 11

Looking Westbound along Ryan Road at Franklin Drive

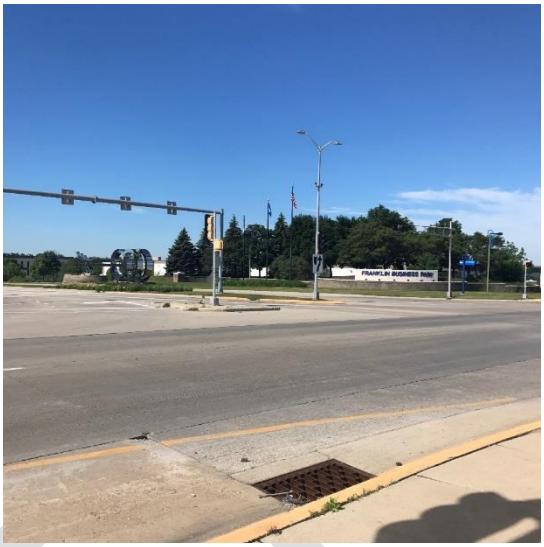

Photo 12

Looking Southbound along Ryan Road at Franklin Drive

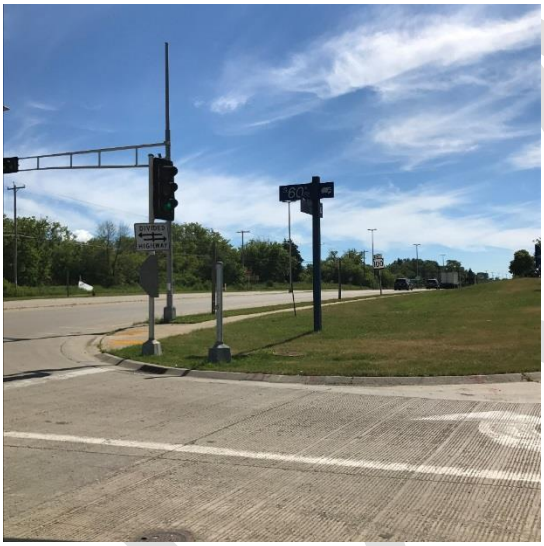

Photo 18
Looking Eastbound along Ryan Road at 60th Street

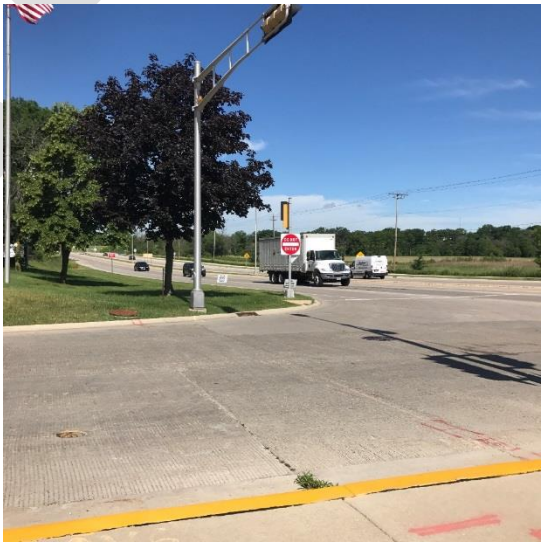

Photo 19
Looking Westbound along Ryan Road at 60th Street

Panel 5 in the Route Alternative Panels continues from the west end of Panel 4 at approximately 550 feet east of the point at which Ryan Road crosses the Root River. At the Ryan Road crossing of the Root River, the roadway transitions from four-lane, two-way to a two-lane, two-way roadway. The land use around the route in Panel 5 is primarily rural, with agricultural, residential, and commercial areas. At the east end of Panel 5, the potential HDD is shown from Panel 4. The total length of both the Water Supply and Return Flow Pipelines within Panel 5 is approximately 3,500 feet.

Panel 6 in the Route Alternative Panels continues from the west end of Panel 5 at approximately 1,300 feet east of 76th Street. As shown in this panel, Ryan Road is a two-lane, two-way roadway. The land use around the route in Panel 6 is primarily rural and agricultural, with some light industrial and commercial areas. At the intersection of Ryan Road and 76th Street, a jack and bore method is being considered to install approximately 175 linear feet of pipe casing. This construction method is being considered to minimize traffic disruption at 76th Street. The total length of the Common Corridor within Panel 6 is approximately 3,500 feet. See Photo 20 for visual reference.

Panel 7 in the Route Alternative Panels continues from the west approximately 1,050 feet east of the intersection of Ryan Road and Saint Martins Road. Ryan Road is a two-lane, two-way roadway. The land use around the route in Panel 7 is primarily rural and agricultural, with residential properties. At approximately 350 feet to the west of the intersection of Ryan Road and Saint Martins Road, trenchless construction method of HDD is being considered to install a length of 350 feet of the pipelines below an existing concrete culvert. The total length of the Common Corridor within Panel 7 is approximately 3,500 feet. See Photos 21 through 24 for visual reference.

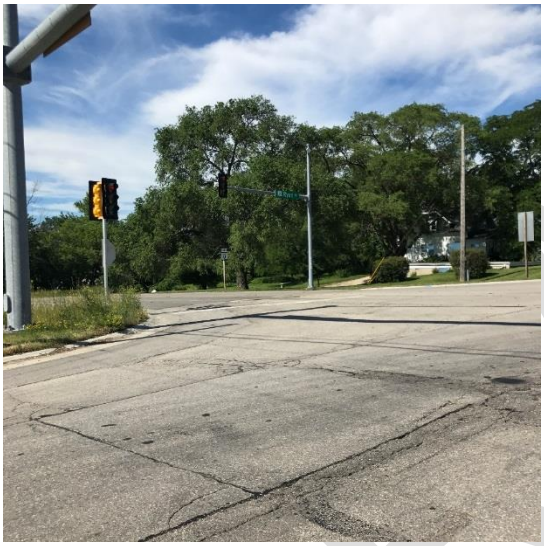

Photo 20
Looking Southwest along 76th Street at Ryan Road

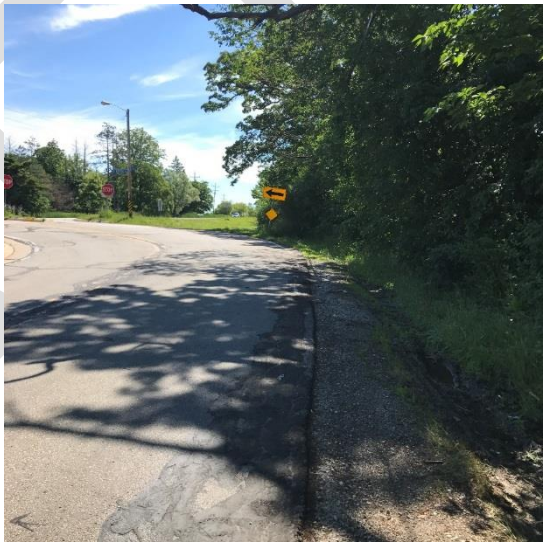

Photo 21
Looking Eastbound along Ryan Road

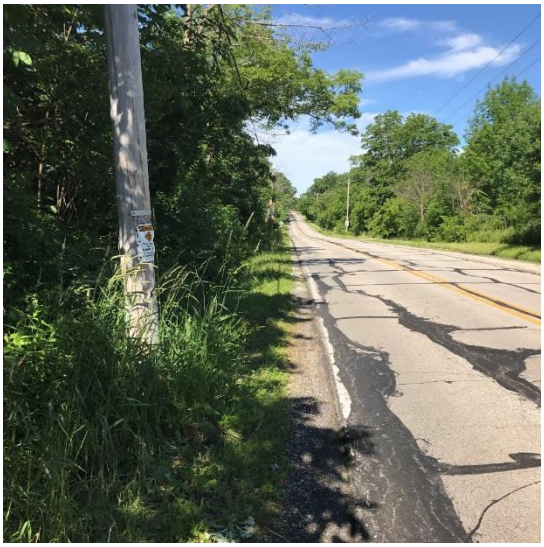

Photo 22
Looking Westbound along Ryan Road

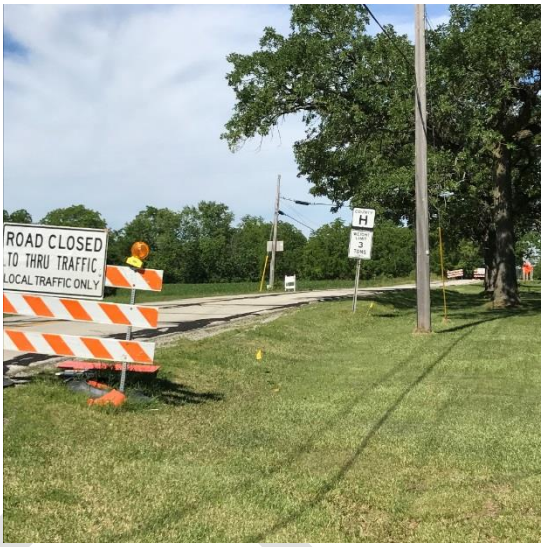

Photo 23
Looking Westbound along Ryan Road at 92nd Street

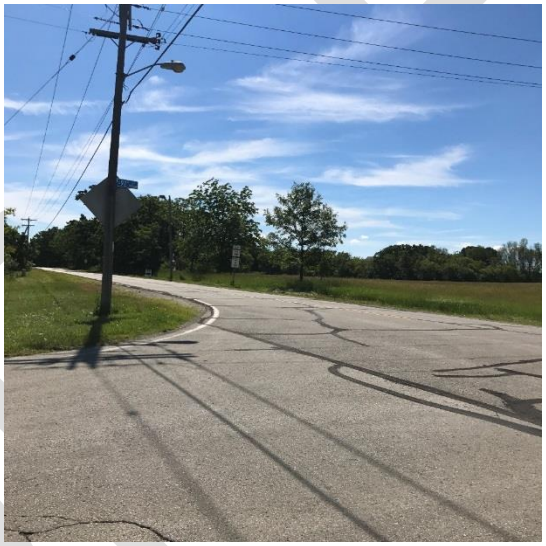

Photo 24
Looking Eastbound along Ryan Road at 92nd Street

Panel 8 in the Route Alternative Panels continues from the west end of Panel 7 immediately following the intersection of Ryan Road and 92nd Street. As shown in this panel, Ryan Road is a two-lane, two-way roadway. The land use around the route in Panel 8 is primarily rural and agricultural, with residential properties. Shown in both Panel 8 and Panel 9, the pipelines travel through an easement for a total of 1,300 feet. The total length of the Common Corridor within Panel 8 is approximately 3,500 feet.

Panel 9 in the Route Alternative Panels continues from the west end of Panel 8. As shown in this panel, Ryan Road is a two-lane, two-way roadway. The land use around the route in Panel 9 is primarily rural and agricultural, with residential areas. Within this panel, preliminary alignments of the pipelines pass through a total of eight privately owned parcels for a total length of 3,100 feet. Tax IDs for the parcels which the pipelines pass through, from east to west are: 8939995001, 8939997002, 8939997001, 8929989001, 8929989003, 8929989002, 8929990000 and

8929991000. A 50-foot permanent easement spanning across the eight parcels identified would be required. Approximately 850 feet east of the intersection of 112th Street and Ryan Road, a trenchless construction method of HDD is being considered to install 800 linear feet of pipe casing. This method of construction is being considered to avoid wetland and old trees. The total length of the Common Corridor within Panel 9 is approximately 3,500 feet. See Photo 25 for visual reference.

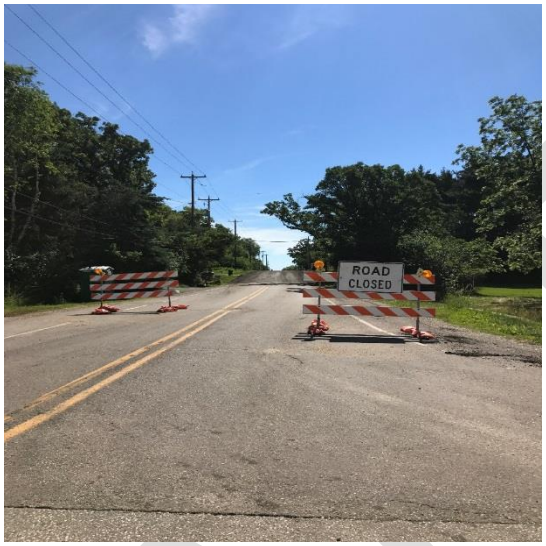

Photo 25
Looking Eastbound along Ryan Road at 112th Street

Panel 10 in the Route Alternative Panels continues from the west end of Panel 9 at approximately 850 feet east of the intersection of Ryan Road and Loomis Road (also commonly designated as Wisconsin Highway 36). As shown in this panel, Ryan Road is a two-lane, two-way roadway with a gravel shoulder. The land use around the route in Panel 10 is primarily rural and agricultural. Approximately 100 feet east of the intersection of Loomis Road, a jack and bore method is being considered to install 340 linear feet of pipe casing. This construction method is being considered to minimize traffic disruption at Loomis Road. The total length of the Common Corridor within Panel 10 is approximately 3,500 feet. See Photos 26 through 28 for visual reference.

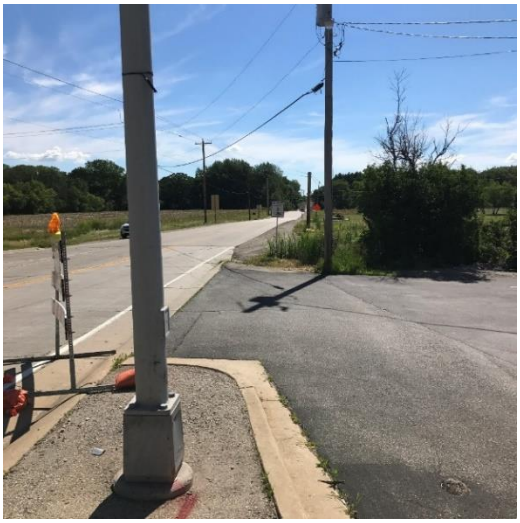

Photo 26

Looking Eastbound along Ryan Road at Loomis Road

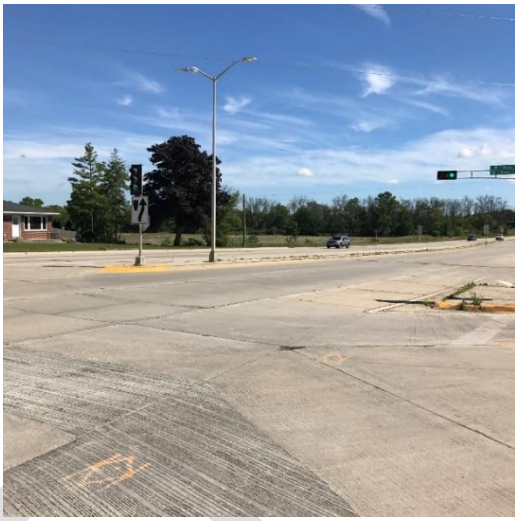

Photo 27

Looking Northeast along Loomis Road at Ryan Road

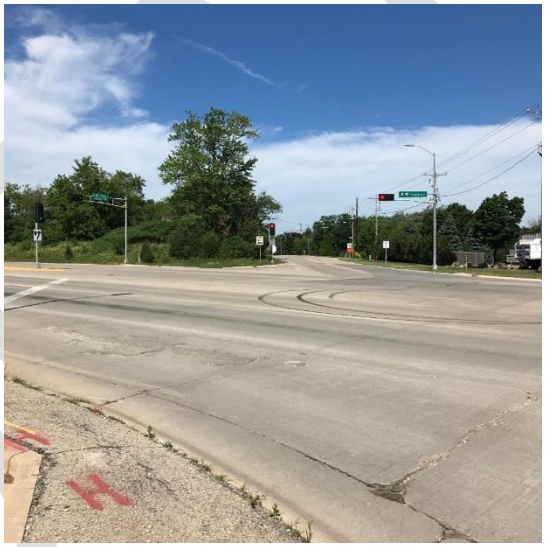

Photo 28

Looking Westbound along Ryan Road at Loomis Road

Cape Road Segment

Panel 11 in the Route Alternative Panels continues from the west end of Panel 10 at approximately 1,250 feet east of the intersection of Ryan Road and Cape Road. As shown in this panel, Ryan Road is a two-lane, two-way roadway, and Cape Road is a two-lane, two-way roadway with a large concrete shoulder. The land use around the route in Panel 11 is primarily rural, with residential and agricultural areas. The total length of the Common Corridor within Panel 11 is approximately 3,300 feet. See Photos 29 through 31 for visual reference.

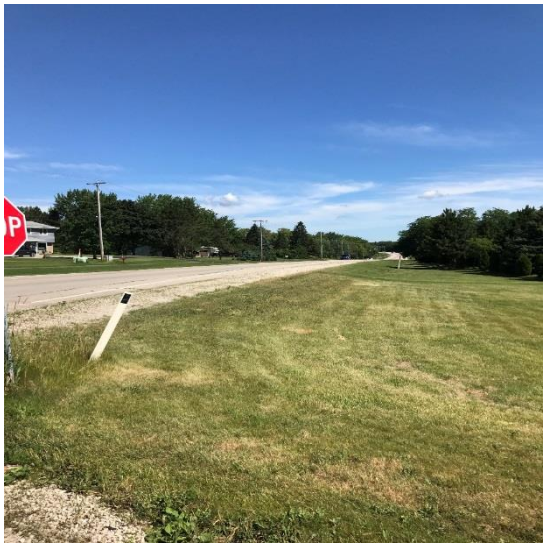

Photo 29

Looking Northbound along Cape Road at Ryan Road

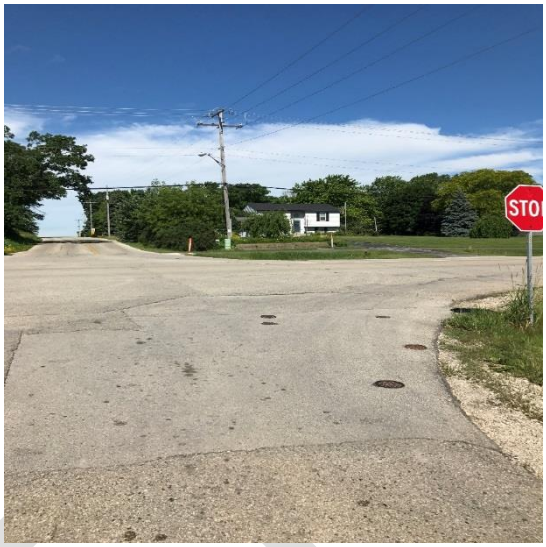

Photo 30

Looking Westbound along Ryan Road at Cape Road

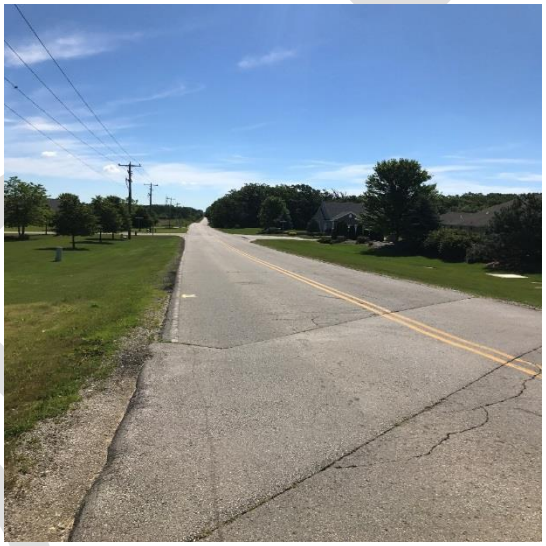

Photo 31

Looking Eastbound along Ryan Road at Cape Road

Panel 12 in the Route Alternative Panels continues from the north end of Panel 11 at approximately 1,900 feet north of the intersection of Ryan Road and Cape Road. As shown in this panel, Cape Road is a two-lane, two-way roadway with a large concrete shoulder. The land use around the route in Panel 12 is primarily rural, with residential areas. The total length of the Common Corridor within Panel 12 is approximately 2,500 feet.

Durham Drive Segment

Panel 13 in the Route Alternative Panels continues from the north end of Panel 12 at approximately 800 feet south of the intersection of Durham Drive and Cape Road. As shown in this panel, Cape Road is a two-lane, two-way roadway with a large concrete shoulder, and Durham Drive is a two-lane, two-way roadway. The land use around the route in Panel 13 is primarily rural, with residential and agricultural areas. At the southeast corner of Cape Road and Durham Drive, a jack and bore method is being considered to install approximately 100 linear feet of pipe. This construction method is being considered to minimize traffic disruption at the intersection of the two streets. The total length of the Common Corridor within Panel 13 is approximately 3,100 feet. See Photos 32 and 33 for visual reference.

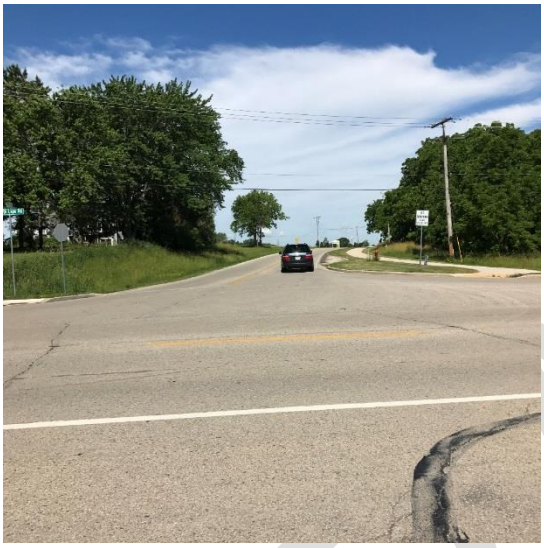

Photo 32

Looking Westbound along Durham Drive at Cape Road

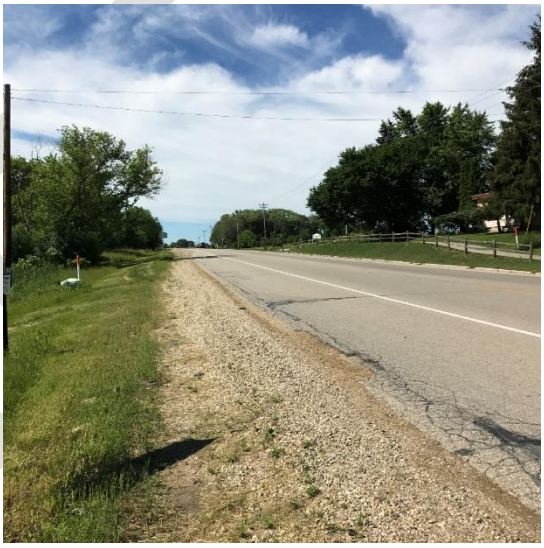

Photo 33

Looking Southbound along Cape Road at Durham Drive

Panel 14 in the Route Alternative Panels continues from the north end of Panel 13 at approximately 1,950 feet northwest of the intersection of Durham Drive and Cape Road. As shown in this panel, Durham Drive is a two-lane, two-way roadway. The land use around the route in Panel 14 is primarily rural, with residential and agricultural areas. The total length of the Common Corridor within Panel 14 is approximately 3,600 feet. See Photos 34 through 36 for visual reference.

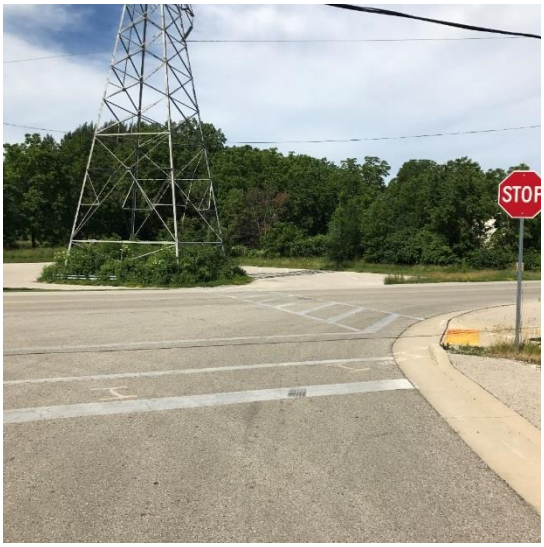

Photo 34

Looking Southwest the intersection of Durham Drive and Hi View Drive

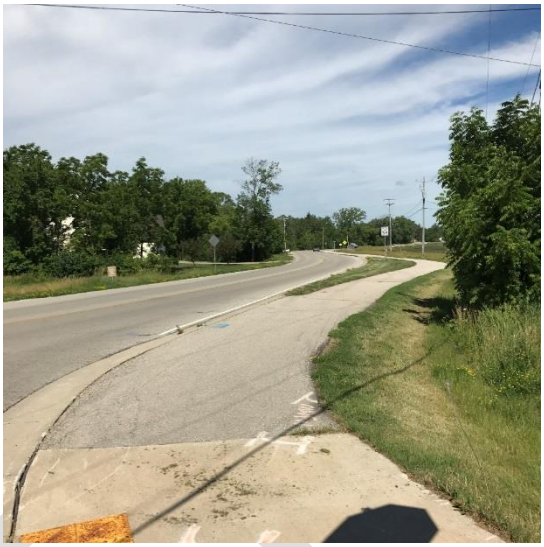

Photo 35

Looking Northbound along Durham Drive at Hi View Drive

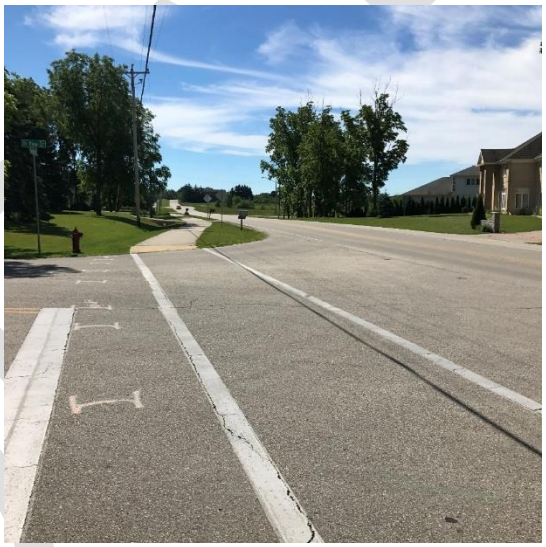

Photo 36

Looking Southbound along Durham Drive at Hi View Drive

Panel 15 in the Route Alternative Panels continues from the north end of Panel 14 at approximately 950 feet northwest of the intersection of Durham Drive and Hi View Drive. As shown in this panel, Durham Drive is a two-lane, two-way roadway. The land use around the route in Panel 15 is primarily rural, with residential and agricultural areas. The total length of the Common Corridor within Panel 15 is approximately 3,500 feet.

Panel 16 in the Route Alternative Panels continues from the north end of Panel 15 approximately 700 feet south of the intersection of Durham Drive and McShane Drive. As shown in this panel, Durham Drive is a two-lane, two-way

roadway. The land use around the route in Panel 16 is primarily rural, with residential areas. The total length of the Common Corridor within Panel 16 is approximately 2,400 feet. See Photos 37 and 38 for visual reference.

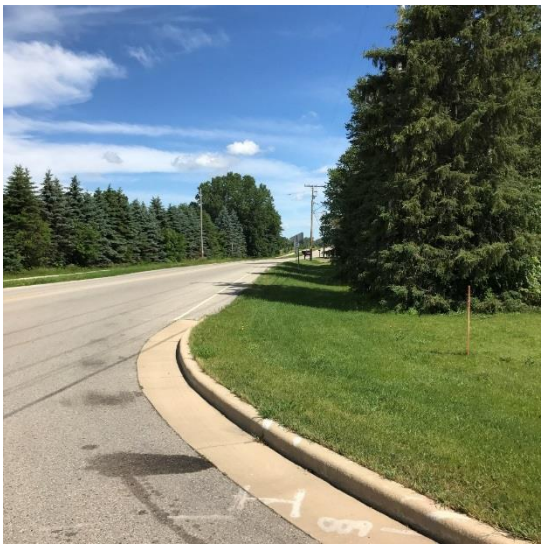

Photo 37

Looking Northbound along Durham Drive at McShane Drive

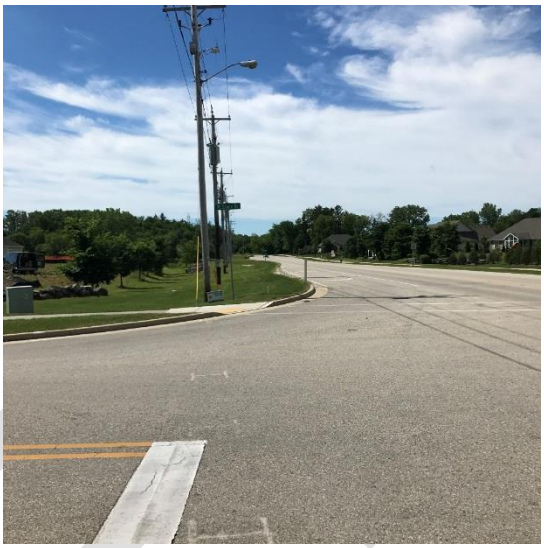

Photo 38

Looking Southbound along Durham Drive at McShane Drive

Moorland Road Segment

Panel 17 in the Route Alternative Panels continues from the north end of Panel 16 at approximately 650 feet south of the intersection of Durham Drive and Woods Road. As shown in this panel, Durham Drive changes names to Moorland Road when it curves to the west. The entire length of this roadway is a two-lane, two-way roadway. The land use around the route in Panel 17 is primarily rural, with residential areas. The total length of the Common Corridor within Panel 17 is approximately 4,200 feet. See Photos 39 and 40 for visual reference.

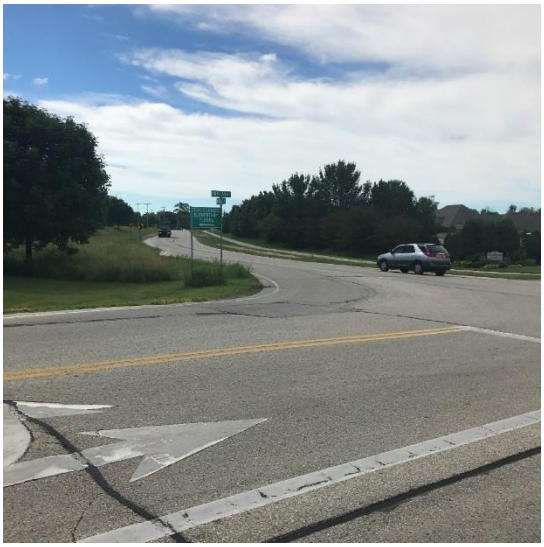

Photo 39

Looking Southbound along Durham Drive at Durham Place

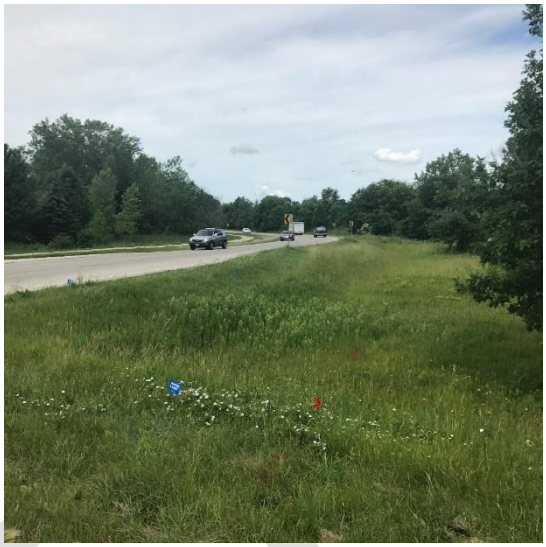

Photo 40

Looking Northbound along Moorland Road at Durham Place

Panel 18 in the Route Alternative Panels continues from the north end of Panel 17 at approximately 1,450 feet south of the intersection of Moorland Road and Janesville Road. As shown in this panel, Moorland Road begins as a two-lane, two-way roadway and approximately 350 feet prior to the intersection with Janesville Road, Moorland Road transitions to a four-lane, divided two-way roadway. The land use around the route in Panel 18 is primarily rural, with residential, commercial, and agricultural areas. On the median of the east portion of the intersection of Moorland Road and Janesville Road to the northeast corner of the intersection, a jack and bore method is being considered to install approximately 160 linear feet of pipe casing. Then, a jack and bore method is being considered to install approximately 180 linear feet of pipe casing to cross Moorland Road from east to west. This construction method is being considered to minimize traffic disruption at the surrounding intersection. The total length of the Common Corridor within Panel 18 is approximately 2,900 feet. See Photos 41 through 44 for visual reference.

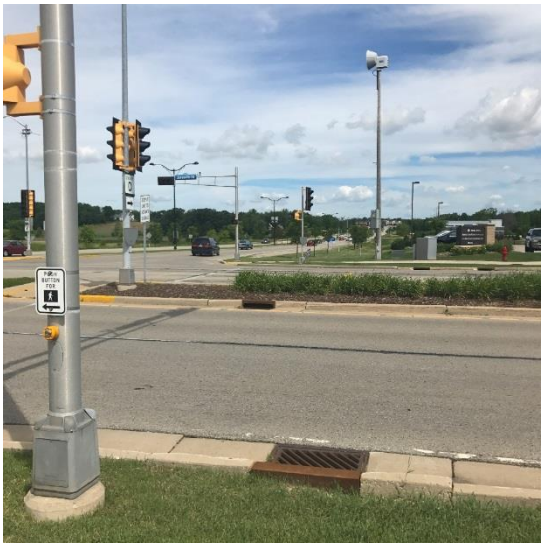

Photo 41

Looking Northbound along Moorland Road at Janesville Road

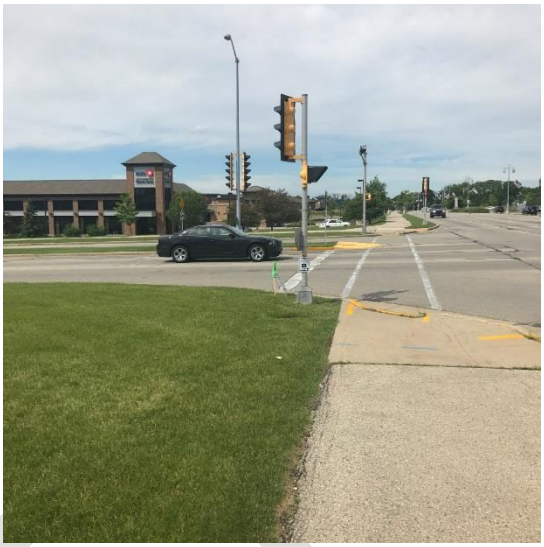

Photo 42

Looking Westbound along Janesville Road at Moorland Road

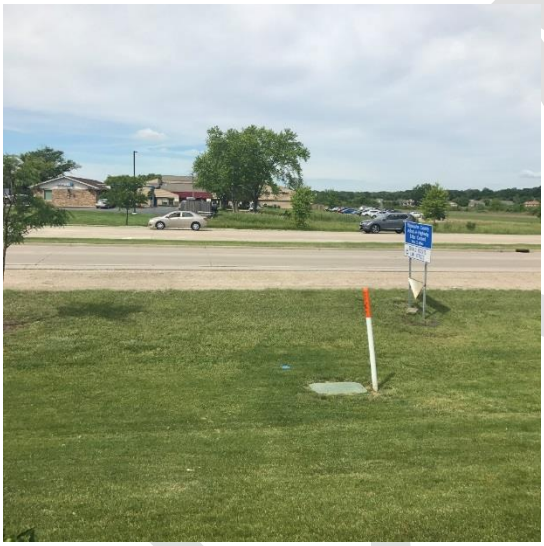

Photo 43

Looking Westbound along Moorland Road

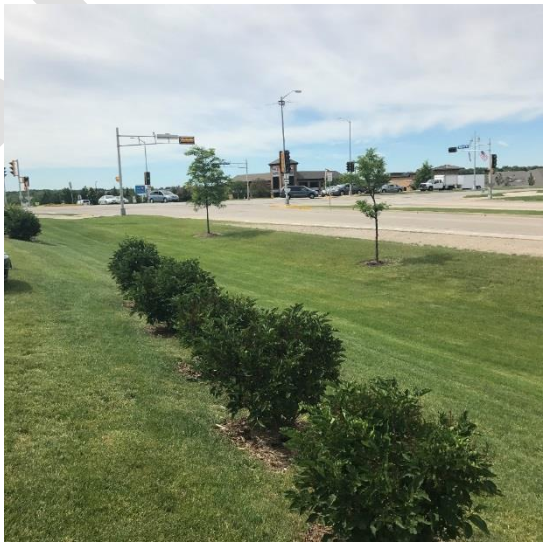

Photo 44

Looking Southbound along Moorland Road at Janesville Road

Panel 19 in the Route Alternative Panels continues from the north end of Panel 18 at approximately 1,050 feet northwest of the intersection of Moorland Road and Janesville Road. As shown in this panel, Moorland Road is a four-lane, divided two-way roadway. The land use around the route in Panel 19 is primarily rural, with commercial and agricultural areas. The total length of the Common Corridor within Panel 19 is approximately 2,700 feet. See Photos 45 and 46 for visual reference.

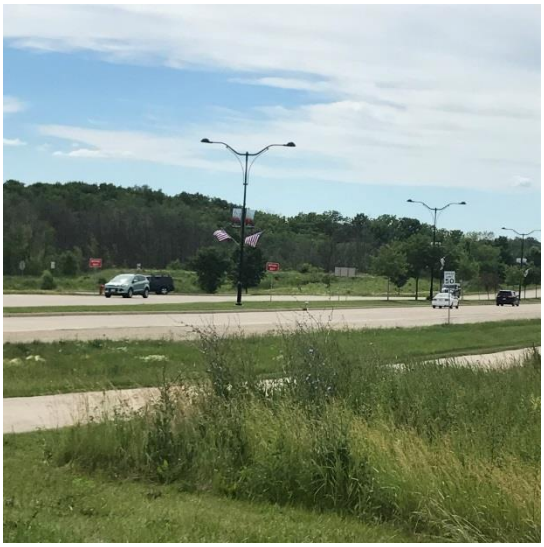

Photo 45
Looking Southbound along Moorland Road at Commerce Center Parkway

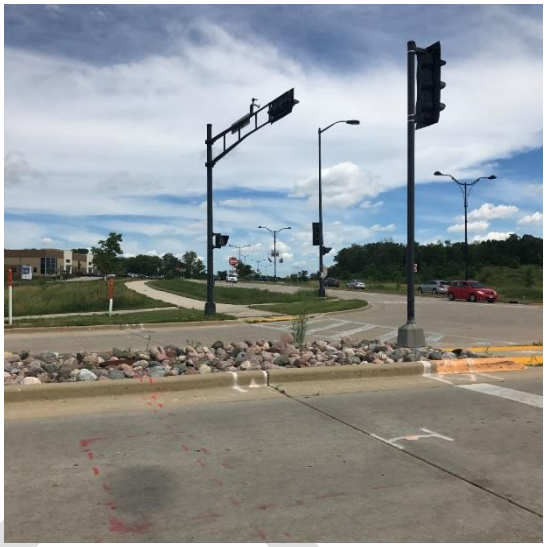

Photo 46
Looking Northbound along Moorland Road at Commerce Center Parkway

Panel 20 in the Route Alternative Panels continues from the north end of Panel 19 at approximately 850 feet south of the intersection of Moorland Road and College Avenue. As shown in this panel, Moorland Road is a four-lane, divided two-way roadway. The roadway transitions into a two-lane, two-way roadway approximately 700 feet north of the intersection with College Avenue. The land use around the route in Panel 20 is primarily agricultural, few commercial and residential properties. At the southwest corner of the intersection with College Avenue, a jack and bore method is being considered to install approximately 110 linear feet of pipe casing. This construction method is being considered to cross College Avenue from south to north and to minimize traffic disruption at the surrounding intersection. The total length of the Common Corridor within Panel 20 is approximately 2,400 feet. See Photo 47 for visual reference.

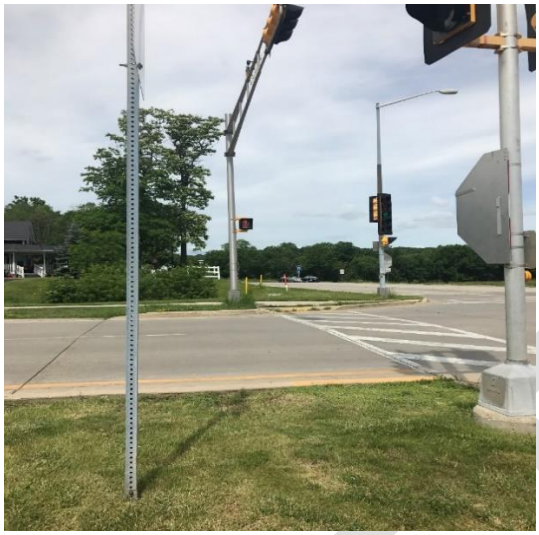

Photo 47

Looking Westbound along College Avenue at Moorland Road

Panel 21 in the Route Alternative Panels continues from the north end of Panel 20 at approximately 1,400 feet north of the intersection of Moorland Road and College Avenue. As shown in this panel, Moorland Road is a two-lane, two-way roadway, and Westridge Drive is also a two-lane, two-way roadway. The land use around the route in Panel 21 is primarily rural, with commercial areas. The total length of the Common Corridor within Panel 21 is approximately 2,800 feet. See Photos 48 through 50 for visual reference.

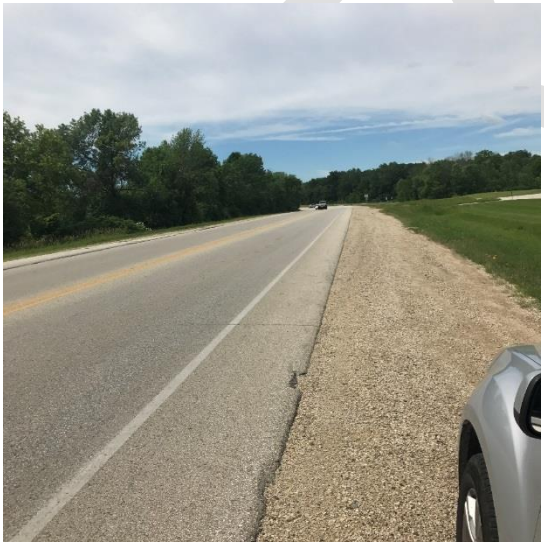

Photo 48
Looking Southbound along Moorland Road at Westridge Drive

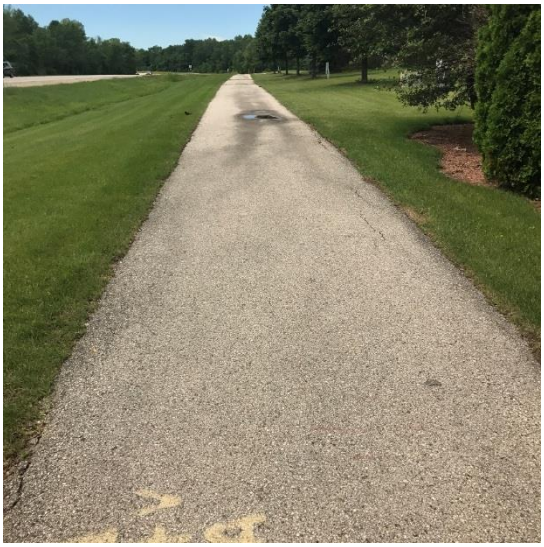

Photo 49
Looking Southbound along Moorland Road at Westridge Drive

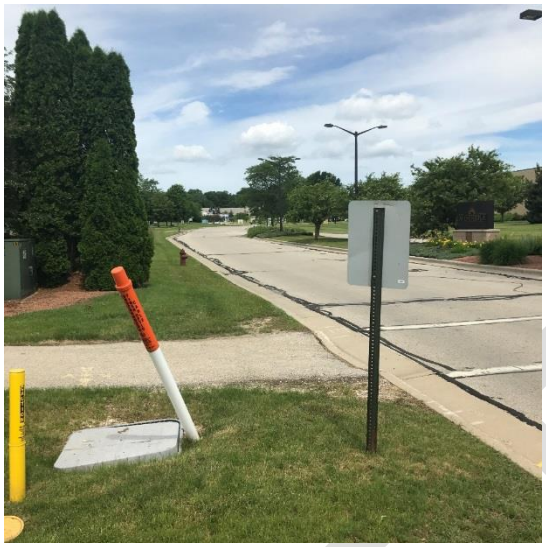

Photo 50

Looking Westbound along Westridge Drive at Moorland Road

Westridge Road/Small Road Segment

Panel 22 in the Route Alternative Panels continues from the north end of Panel 21 at approximately 400 feet northwest of the intersection of Westridge Drive and Moorland Road. As shown in this panel, Westridge Drive is a two-lane, two-way roadway. The land use around the route in Panel 22 is a primarily rural, with agricultural, commercial and residential areas. The construction within Parcels NBC 1286999002 and NBC 1286999001 would require 50-foot permanent easements and 15-foot temporary easements. At the northwest boundary of Parcel NBC 1286999002, a jack and bore method is being considered to install approximately 375 linear feet of pipe casing. This construction method is being considered to cross Interstate 43 to Parcel NBC 1286999001, avoiding traffic disruption along Interstate 43. The total length of the Common Corridor within Panel 22 is approximately 5,600 feet. See Photos 51-52 and 115-116 for visual reference.

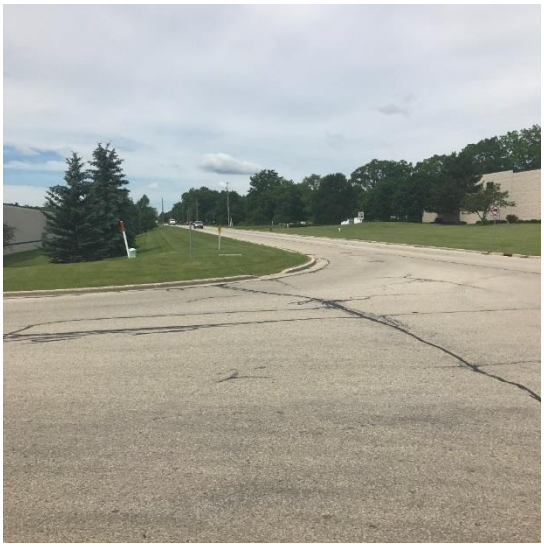

Photo 51

Looking Southwest along Small Road at Westridge Drive

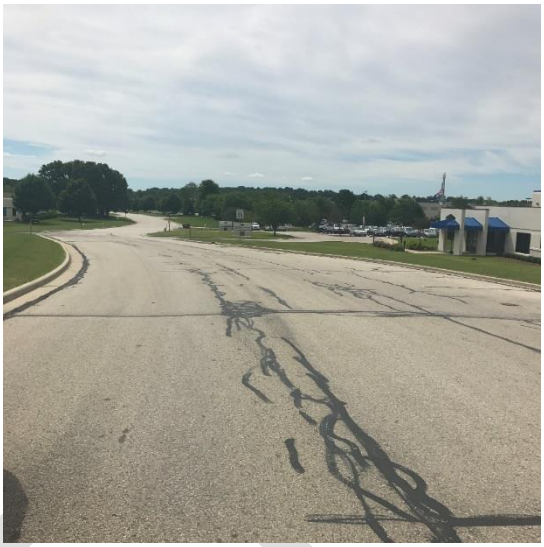

Photo 52

Looking Southeast along Westridge Drive at Small Road

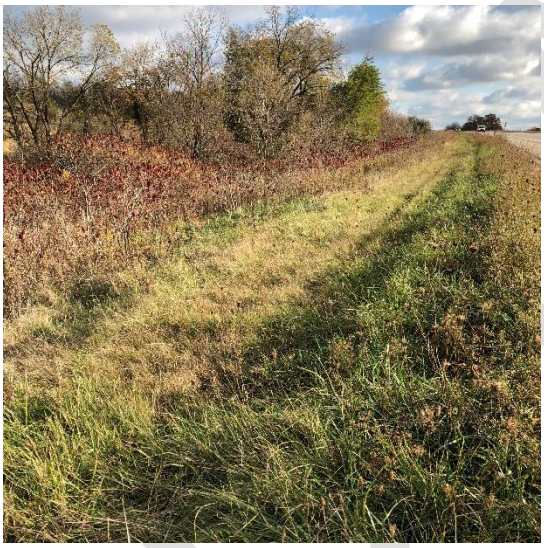

Photo 115

Looking Southbound along Interstate 43

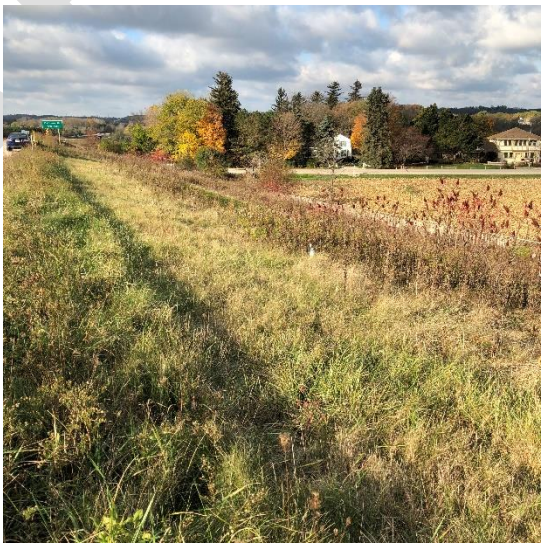

Photo 116

Looking Northbound along Interstate 43

Calhoun Road Segment

Panel 23 in the Route Alternative Panels continues from the west end of Panel 22 at approximately 1,250 feet east of the intersection of Calhoun Road and Beres Road, within Parcel NBC 1286999001. As shown in this panel, Calhoun Road is a two-lane, two-way roadway. The land use around the route in Panel 23 is primarily rural, with agricultural areas. The total length of the Common Corridor within Panel 23 is approximately 3,600 feet. See Photos 53 and 54 for visual reference.

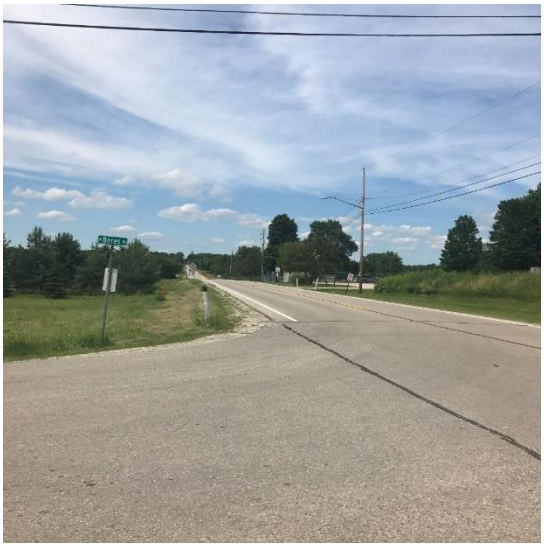

Photo 53

Looking Northbound along Calhoun Road at Beres Road

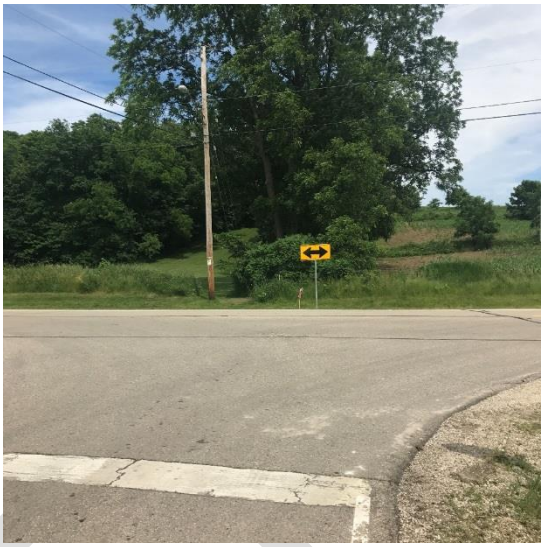

Photo 54

Looking Eastbound along Beres Road at Calhoun Road

Panel 24 in the Route Alternative Panels continues from the north end of Panel 23 at approximately 650 feet south of the intersection of Calhoun Road and Beloit Road. As shown in this panel, Calhoun Road is a two-lane, two-way roadway. The land use around the route in Panel 24 is rural, with agricultural and residential areas. The total length of the Common Corridor within Panel 24 is approximately 2,400 feet.

Panel 25 in the Route Alternative Panels continues from the north end of Panel 24 at approximately 1,200 feet south of Salentine Drive. As shown in this panel, Calhoun Road, National Avenue, Lawnsdale Road are all two-lane, two-way roadways. The land use around the route in Panel 25 is primarily rural, with agricultural and residential areas. The construction within Parcels NBC 1236993 and NBC 1236995 would require 50-foot permanent easements and a 15-foot temporary easement. The total length of the Common Corridor within Panel 25 is approximately 5,200 feet. See Photo 55 for visual reference.

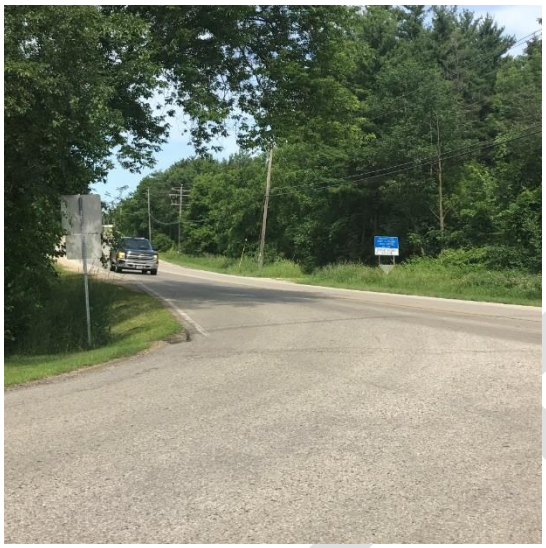

Photo 55

Looking Northbound along National Avenue at Lawnsdale Road

Lawnsdale Road Segment

Panel 26 in the Route Alternative Panels continues from the west end of Panel 25 at approximately 150 feet east of the intersection of Lawnsdale Road and Trillium Drive. As shown in this panel, Lawnsdale Road is a two-lane, two-way roadway. The land use around the route in Panel 26 is primarily rural, with residential areas. The total length of the Common Corridor within Panel 26 is approximately 3,500 feet.

Racine Avenue Segment

Panel 27 in the Route Alternative Panels continues from the west end of Panel 26 at approximately 150 feet to the east of the intersection of Lawnsdale Road and Providence Drive. As shown in this panel, Lawnsdale Road and Racine Avenue are both two-lane, two-way roadways. The land use around the route in Panel 27 is primarily rural, with agricultural and residential areas. The total length of the Common Corridor within Panel 27 is approximately 3,000 feet. See Photos 67 and 68 for visual reference.

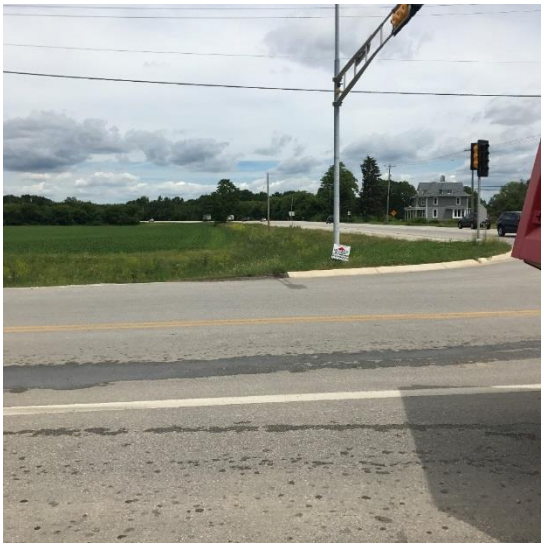

Photo 67

Looking Northbound along Racine Avenue at Lawnsdale Road

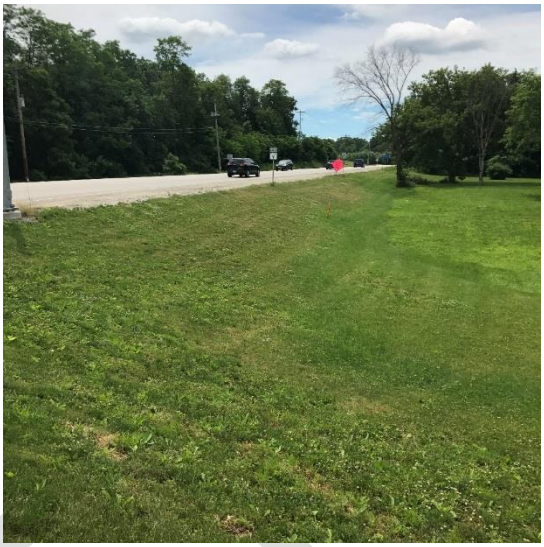

Photo 68

Looking Southbound along Racine Avenue at Lawnsdale Road

Panel 28 in the Route Alternative Panels continues from the north end of Panel 27 at approximately 1,450 feet southeast of the intersection of Observatory Road and Racine Avenue. As shown in this panel, Racine Avenue is a two-lane, two-way roadway. The land use around the route in Panel 28 is rural, with agricultural and residential areas. The total length of the Common Corridor within Panel 28 is approximately 2,800 feet.

Panel 29 in the Route Alternative Panels continues from the north end of Panel 28 at approximately 1,050 feet northeast of the intersection of Racine Avenue and Observatory Road. As shown in this panel, Racine Avenue is a two-lane, two-way roadway. The land use around the route in Panel 29 is rural, with agricultural and residential areas. The total length of the Common Corridor within Panel 29 is approximately 3,100 feet.

Panel 30 in the Route Alternative Panels continues from the north end of Panel 29 at approximately 650 feet southeast of the intersection of Racine Avenue and Swartz Road. As shown in this panel, Racine Avenue is a two-lane, two-way roadway. The land use around the route in Panel 30 is rural, with agricultural and residential areas. The total length of the Common Corridor within Panel 30 is approximately 3,900 feet.

Panel 31 in the Route Alternative Panels continues from the north end of Panel 30 at approximately 1,050 feet southeast of the intersection of Coffee Road and Racine Avenue. As shown in this panel, Racine Avenue is a two-lane, two-way roadway. The land use around the route in Panel 31 is rural, with residential areas. The total length of the Common Corridor within Panel 31 is approximately 3,500 feet. See Photos 69 and 70 for visual reference.

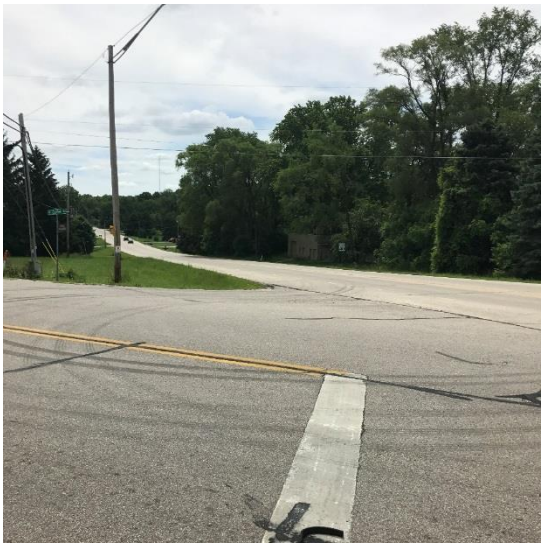

Photo 69

Looking Southbound along Racine Avenue at Coffee Road

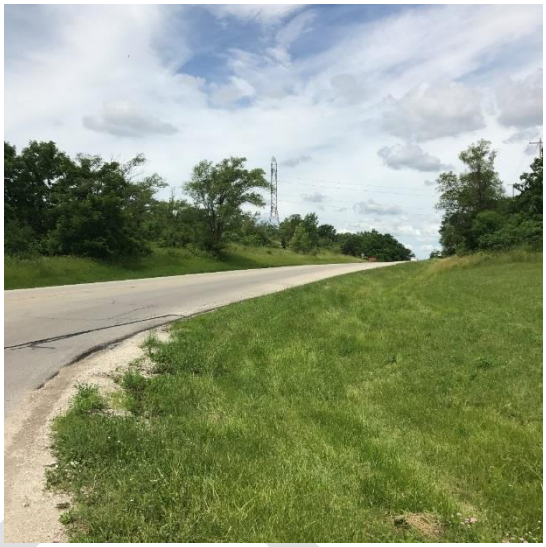

Photo 70

Looking Northbound along Racine Avenue at Coffee Road

Panel 32 in the Route Alternative Panels continues from the west end of Panel 31 at approximately 1,900 feet southeast of the intersection of Sunset Drive and Racine Avenue. As shown in this panel, Racine Avenue is a two-lane, two-way roadway. The land use around the route in Panel 32 is primarily urban, with residential areas. At the southeast corner of the intersection of Sunset Drive and Racine Avenue, the alignment diverges into the separate alignments for the Water Supply and Return Flow Pipelines. The total length of the Water Supply Pipeline within Panel 32 is approximately 3,300 feet. See Photos 81 through 83 for visual reference.

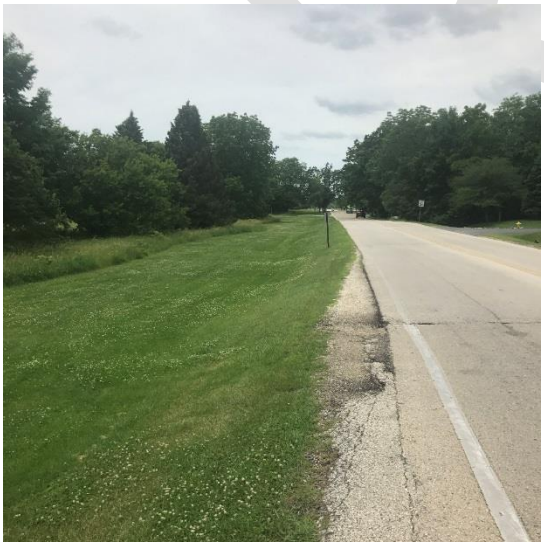

Photo 81

Looking Westbound along East Sunset Drive at Racine Avenue

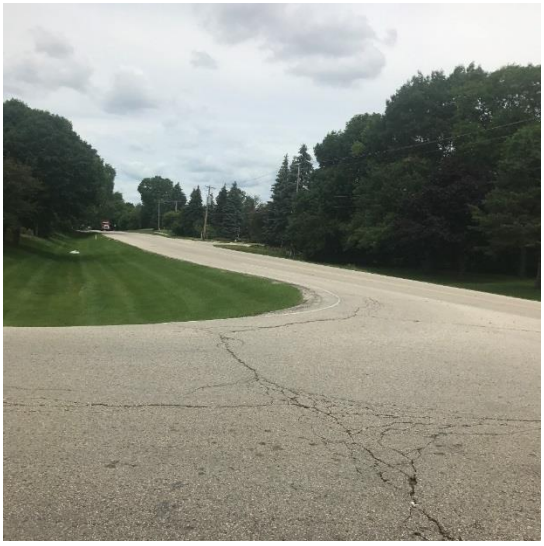

Photo 82

Looking Northbound along Racine Avenue at East Sunset Drive

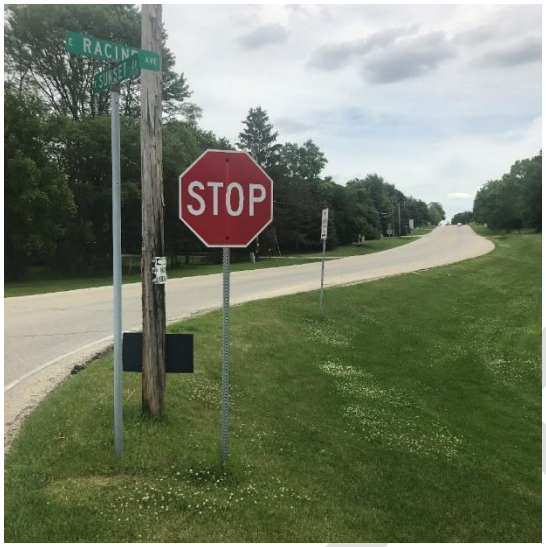

Photo 83

Looking Southbound along Racine Avenue at East Sunset Drive

Panel 33 in the Route Alternative Panels continues from the north end of Panel 32 at approximately 1,200 feet northwest of the intersection of Sunset Drive and Racine Avenue. As shown in this panel, Racine Avenue is primarily a two-lane, two-way roadway, with additional lanes at the intersection with Route 59. The land use around the route in Panel 33 is primarily urban, with residential areas. The total length of the Water Supply Pipeline within Panel 33 is approximately 2,700 feet. See Photos 88 and 89 for visual reference.

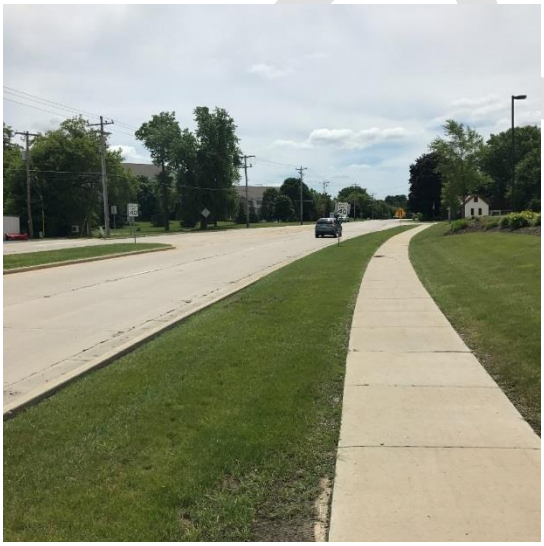

Photo 88

Looking Southbound along Racine Avenue at Route 59

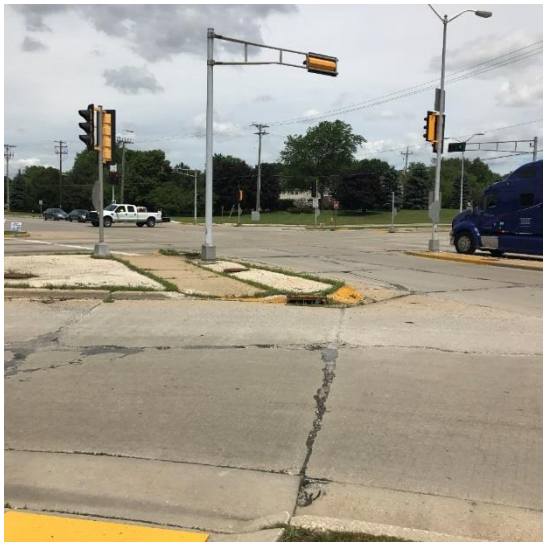

Photo 89

Looking Northbound along Racine Avenue at Route 59

Return Flow Pipeline Route Description (Route Alternative 2)

Sentry Drive Segment

Panel 34 in the Route Alternative Panels displays the beginning of the Return Flow Pipeline at Waukesha's CWP at approximately 1,150 feet west of the intersection of Sentry Drive and the CWP's access drive. As shown in this panel, Sentry Drive is a four-lane, two-way roadway. The land use around the route in Panel 34 is urban, with municipal and industrial areas. The total length of the Return Flow Pipeline within Panel 34 is approximately 2,100 feet. See Photos 112 through 114 for visual reference.

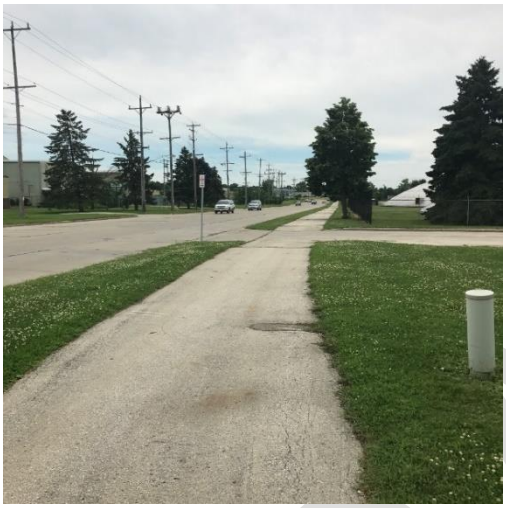

Photo 112

Looking Southbound along Sentry Drive at CWP

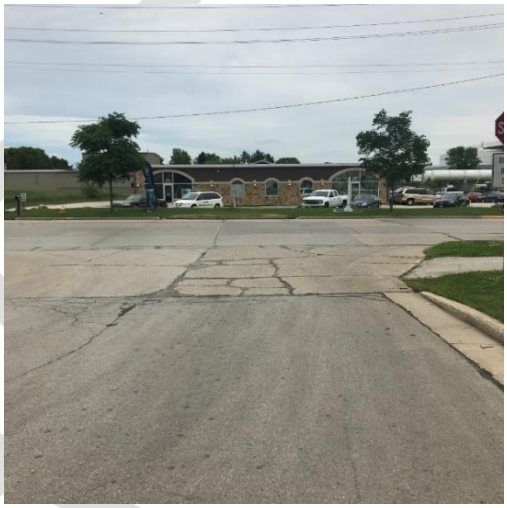

Photo 113

Looking Eastbound along driveway of CWP at Sentry Drive

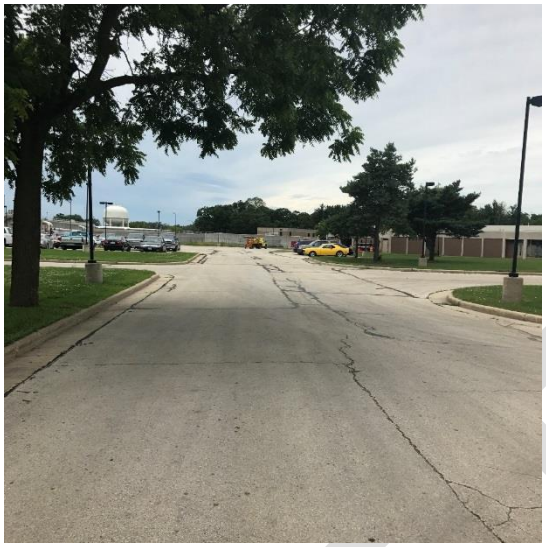

Photo 114

Looking Westbound along driveway of CWP at Sentry Drive

Panel 35 in the Route Alternative Panels continues from the south end of Panel 34 at approximately 2,150 feet north of the intersection of Chapman Drive and Sentry Drive. As shown in this panel, Sentry Drive is a four-lane, two-way roadway. The land use around the route in Panel 35 is urban, with municipal and industrial areas. Approximately 450 feet to the north of the intersection of Chapman Drive and Sentry Drive, a jack and bore method is being considered to install approximately 100 linear feet of pipe casing. This construction method is being considered to cross under existing railroad tracks. The total length of the Return Flow Pipeline within Panel 35 is approximately 2,400 feet. See Photos 108 through 111 for visual reference.

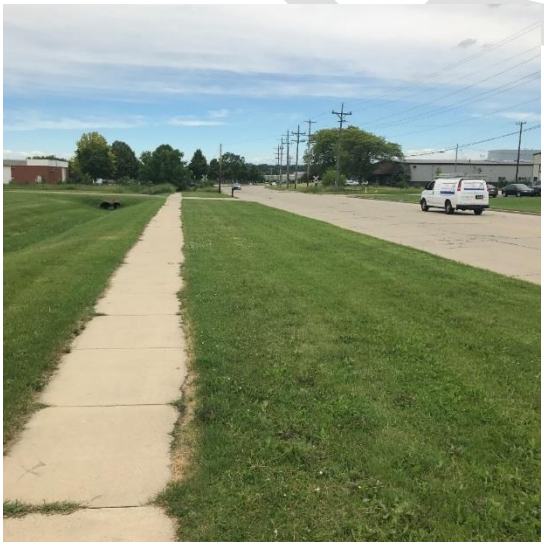

Photo 108

Looking Northbound along Sentry Drive at Chapman Drive

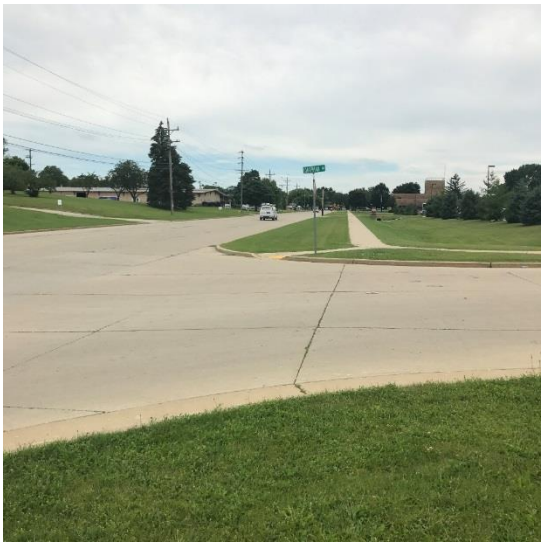

Photo 109

Looking Southbound along Sentry Drive at Chapman Drive

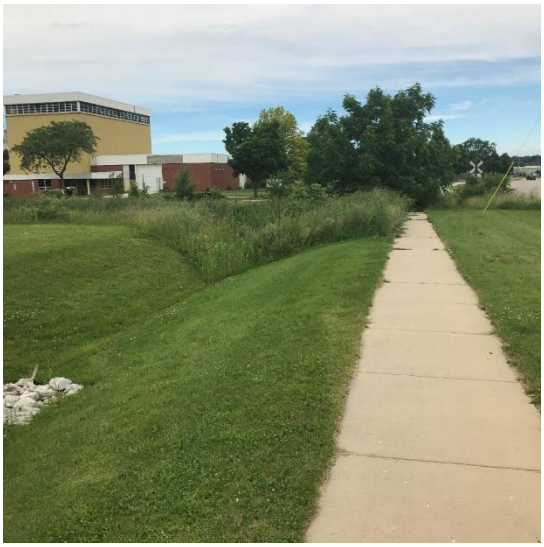

Photo 110

Looking Northbound along Sentry Drive

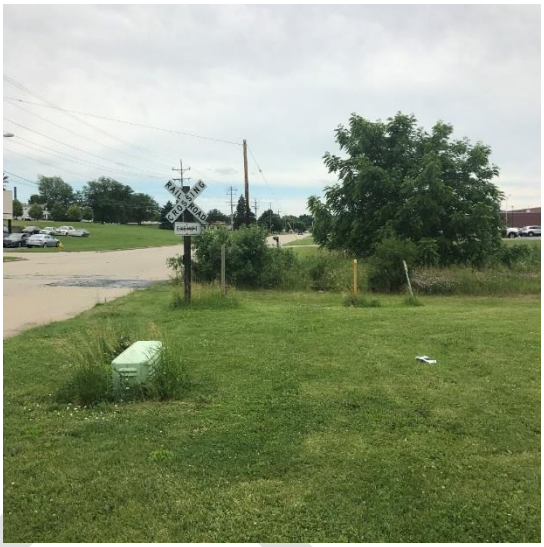

Photo 111

Looking Southbound along Sentry Drive

Sunset Drive Segment

Panel 36 in the Route Alternative Panels continues from the south end of Panel 35 at approximately 1,650 feet north of the intersection of Sentry Drive and Sunset Drive. As shown in this panel, Sunset Drive is a four-lane, two-way roadway. The land use around the route in Panel 36 is urban, with industrial, commercial, and residential areas. The total length of the Return Flow Pipeline within Panel 36 is approximately 3,500 feet. See Photos 104 through 107 for visual reference.

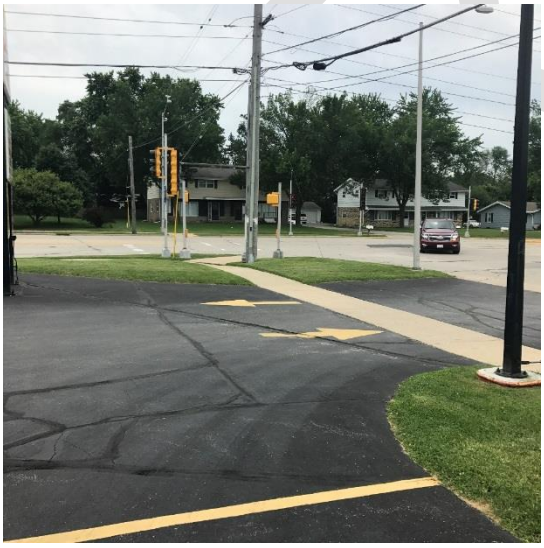

Photo 104

Looking Southbound along Sentry Drive at Sunset Drive

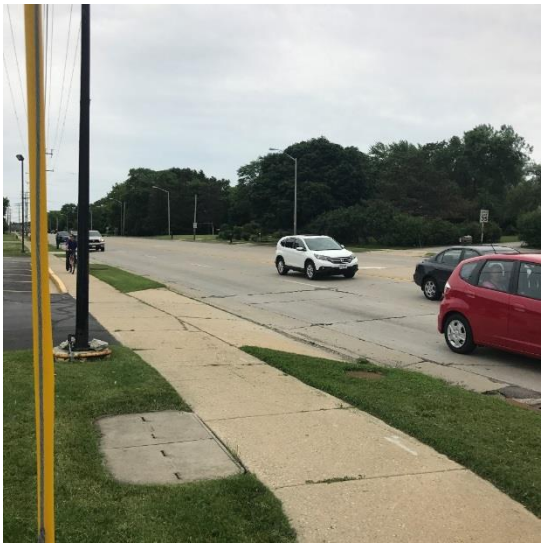

Photo 105

Looking Eastbound along Sunset Drive

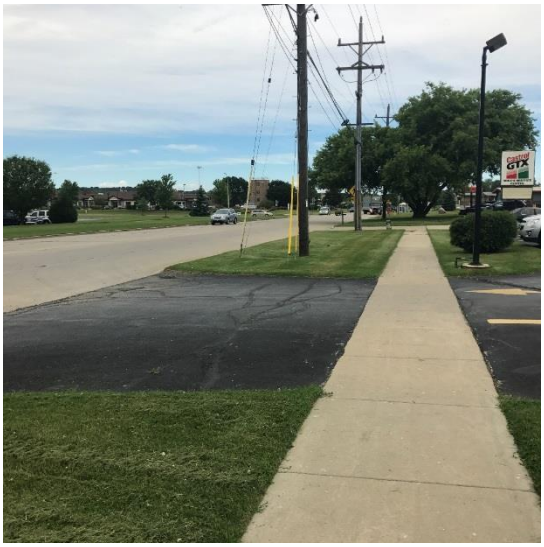

Photo 106

Looking Northbound along Sentry Drive

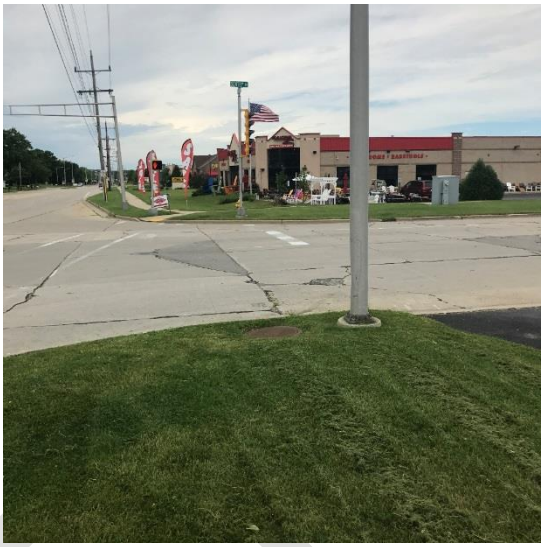

Photo 107

Looking Westbound along Sunset Drive at Sentry Drive

Panel 37 in the Route Alternative Panels continues from the east end of Panel 36 at approximately 1,600 feet west of the intersection of Sunset Drive and West Avenue. As shown in this panel, Sunset Drive and West Avenue are both four-lane, two-way roadways. The land use around the route in Panel 37 is urban, with industrial, commercial, and residential areas. Approximately 500 feet to the west of the intersection of Sunset Drive and West Avenue, a jack and bore method is being considered to install approximately 150 feet of pipe casing is being considered to be installed by using a jack and bore method. This construction method is being considered to cross under existing railroad tracks. The total length of the Return Flow Pipeline within Panel 37 is approximately 2,400 feet. See Photos 100 through 103 for visual reference.

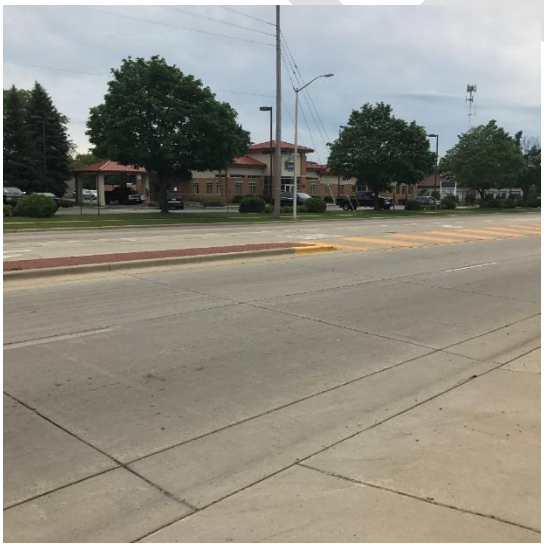

Photo 100

Looking Westbound along Sunset Drive at West Avenue

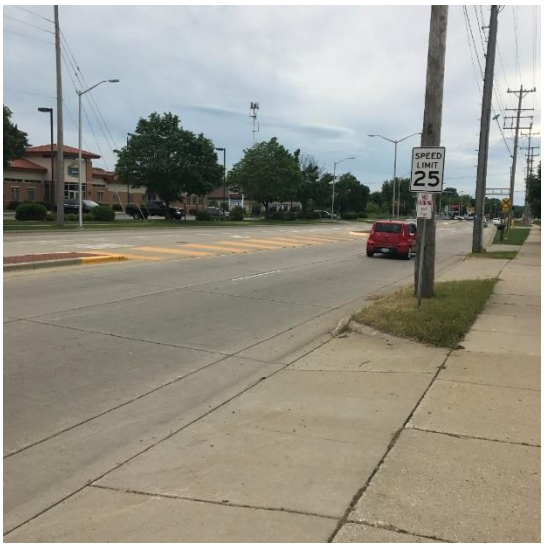

Photo 101

Looking Westbound along Sunset Drive at West Avenue

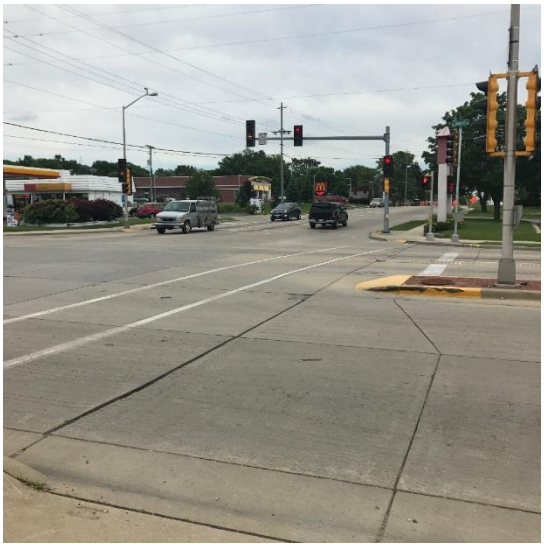

Photo 102

Looking Southbound along West Avenue at Sunset Drive

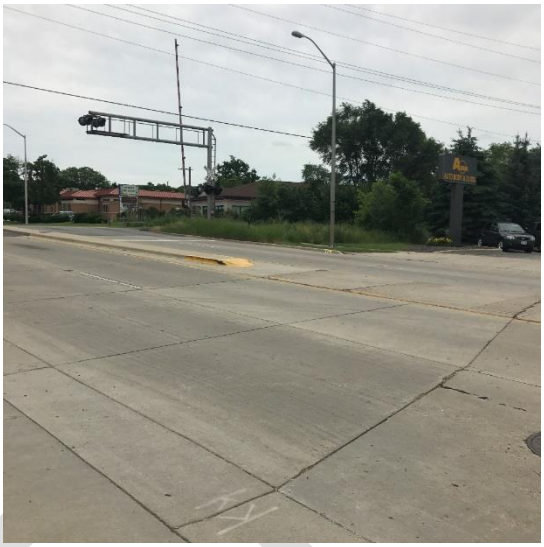

Photo 103

Looking Eastbound along Sunset Drive

West Avenue Segment

Panel 38 in the Route Alternative Panels continues from the south end of Panel 37 at approximately 550 feet south of the intersection of Sunset Drive and West Avenue. As shown in this panel, West Avenue is a four-lane, two-way roadway. The land use around the route in Panel 38 is urban, with industrial, commercial, and residential areas. The total length of the Return Flow Pipeline within Panel 38 is approximately 2,500 feet. See Photos 98 and 99 for visual reference.

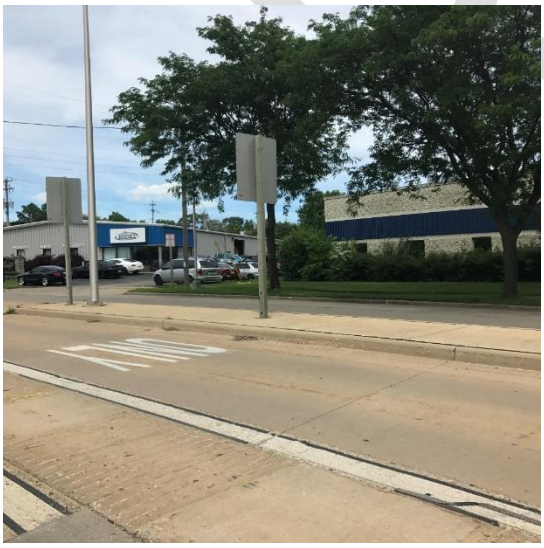

Photo 98

Looking Northbound along West Avenue at Sentinel Drive

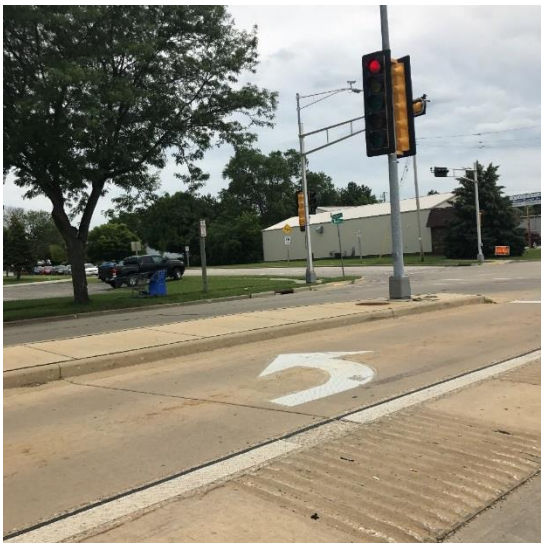

Photo 99

Looking Eastbound along Sentinel Drive at West Avenue

Route 59 Segment

Panel 39 in the Route Alternative Panels continues from the south end of Panel 38 at approximately 1,200 feet north of the intersection of West Avenue and Route 59. As shown in this panel, West Avenue is a four-lane, two-way roadway, and Route 59 is a four-lane, divided two-way roadway. The land use around the route in Panel 39 is urban, with industrial, commercial, and residential areas. The total length of the Return Flow Pipeline within Panel 39 is approximately 2,400 feet. See Photos 96 and 97 for visual reference.

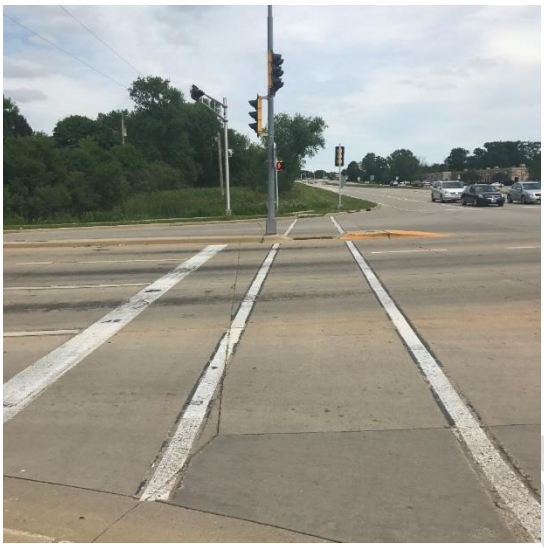

Photo 96

Looking Eastbound along Route 59 at West Avenue

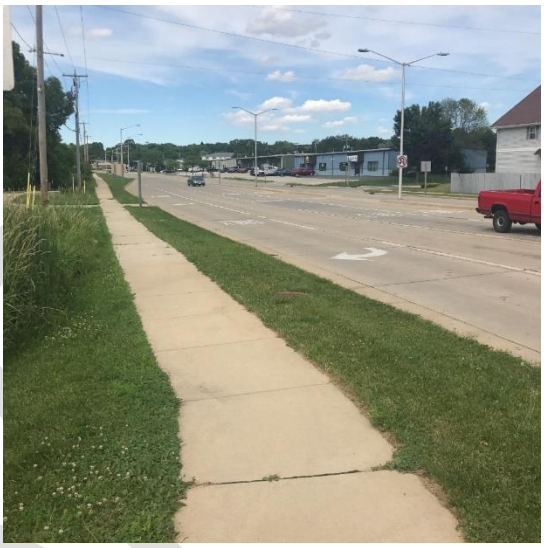

Photo 97

Looking Northbound along West Avenue at Route 59

Panel 40 in the Route Alternative Panels continues from the east end of Panel 39 at approximately 800 feet west of the intersection of Route 59 and East Avenue. As shown in this panel, Route 59 is a four-lane, divided two-way roadway. The land use around the route in Panel 40 is urban, with industrial and residential areas. One hundred feet to the north of the intersection of Route 59 and East Avenue, a jack and bore method is being considered to install approximately 170 linear feet of pipe casing. This construction method is used to minimize traffic disruption along East Avenue. Approximately 1,600 feet northeast from the intersection of East Avenue and Route 59, 350 linear feet of pipe casing is being considered to be installed by trenchless construction method of HDD. This method of construction is being considered to minimize impact to the creek. The total length of the Return Flow Pipeline within Panel 40 is approximately 3,600 feet. See Photos 129-132 and 123-124 for visual reference.

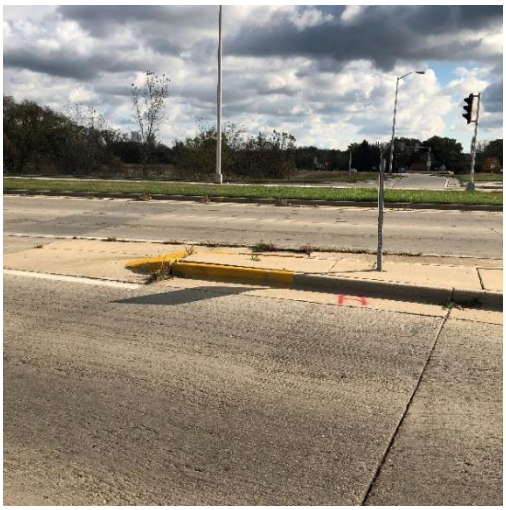

Photo 129

Looking East along Route 59 at East Avenue

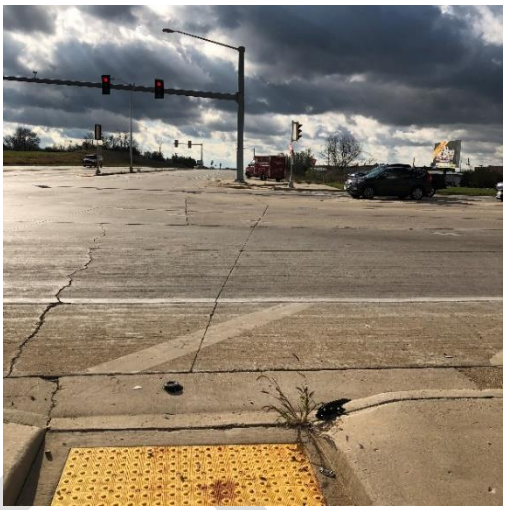

Photo 130

Looking Southbound along Route 164 at Route 59

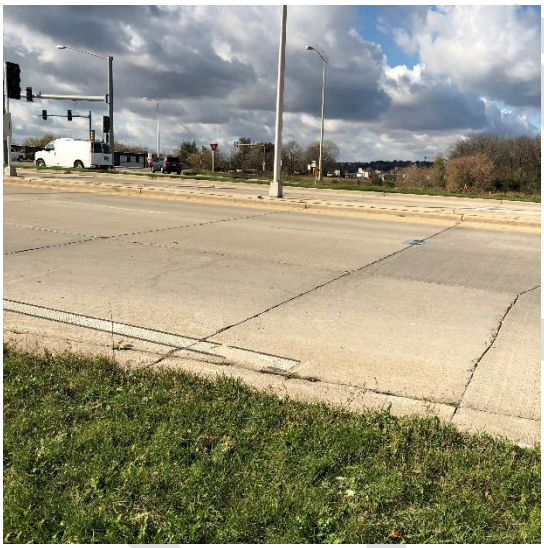

Photo 131

Looking Westbound along Route 59 at East Avenue

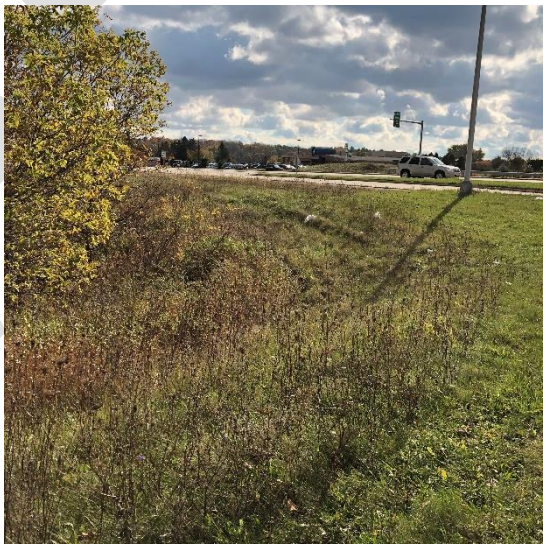

Photo 132

Looking Southeast along Route 59 at East Avenue

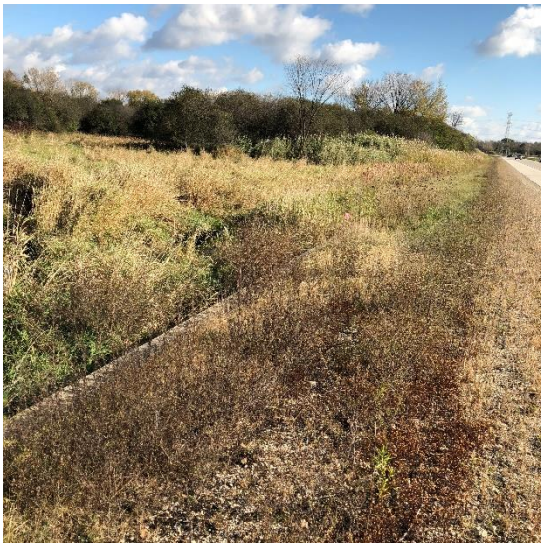

Photo 123

Looking Northbound along Route 59

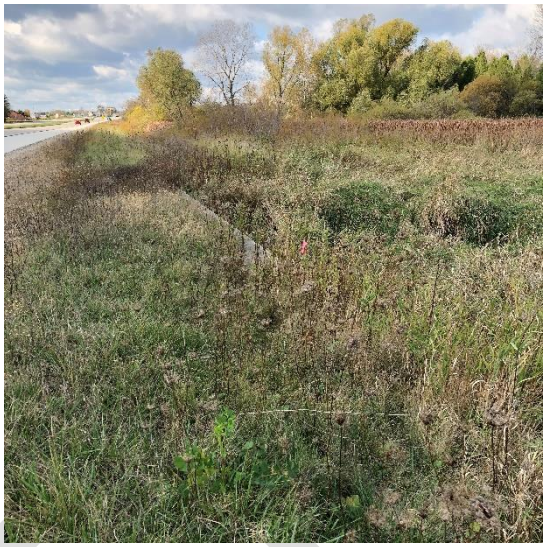

Photo 124

Looking Southbound along Route 59

Panel 41 in the Route Alternative Panels continues from the east end of Panel 40 at approximately 2,400 feet northeast of the intersection of Route 59 and East Avenue. As shown in this panel, Route 59 is a four-lane, divided two-way roadway. The land use around the route in Panel 41 is urban, with industrial and residential areas. The total length of the Return Flow Pipeline within Panel 41 is approximately 4,000 feet.

Sunset Drive Segment

Panel 42 in the Route Alternative Panels continues from the north end of Panel 41 at approximately 750 feet southeast of the intersection of Route 59 and Sunset Drive. As shown in this panel, Route 59 is a four-lane, divided two-way roadway, and Sunset Drive is a four-lane, two-way roadway. The land use around the route in Panel 42 is primarily urban and residential areas. At the southwest corner of the intersection of Route 59 and Sunset Drive, a jack and bore method is being considered to install approximately 170 linear feet of pipe casing. This construction method is being considered to minimize traffic disruption along Route 59. The total length of the Return Flow Pipeline within Panel 42 is approximately 3,300 feet. See Photos 90 and 91 for visual reference.

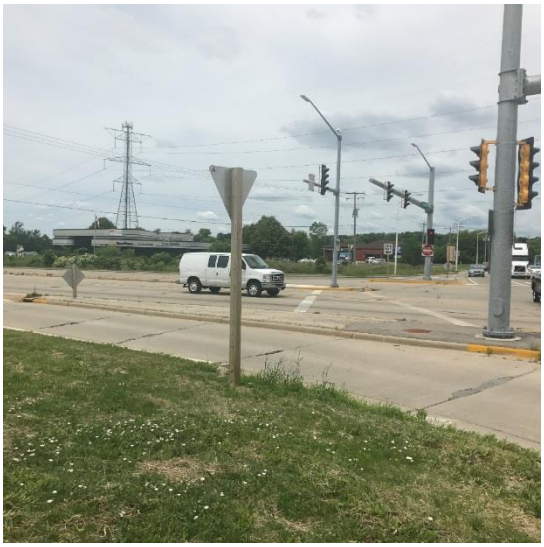

Photo 90

Looking Southbound along Route 59 at Sunset Drive

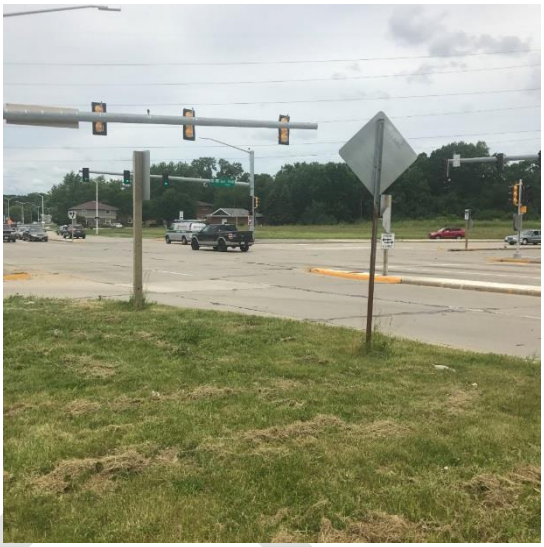

Photo 91

Looking Westbound along Sunset Drive at Route 59

Panel 32 in the Route Alternative Panels continues from the east end of Panel 42 at approximately 1,450 feet west of the intersection of Sunset Drive and Racine Avenue. As shown in this panel, Sunset Drive is a two-lane, two-way roadway. The land use around the route in Panel 32 is urban with residential areas. This panel shows the point where the Water Supply Pipeline diverges from the Common Corridor and proceeds north along Racine Avenue. At the southwest corner of the intersection of Sunset Drive and Racine Avenue, the Return Flow Pipeline converges into the Common Corridor with the Water Supply Pipeline. The total length of the Return Flow Pipeline within Panel 32 is approximately 3,500 feet. See Photos 81 through 83 for visual reference.

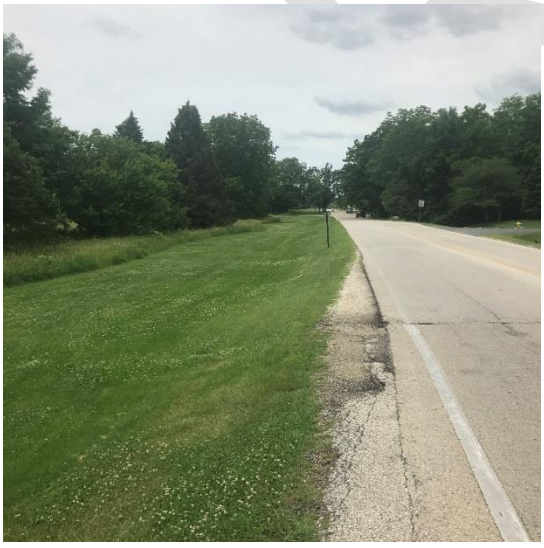

Photo 81

Looking Westbound along Sunset Drive at Racine Avenue

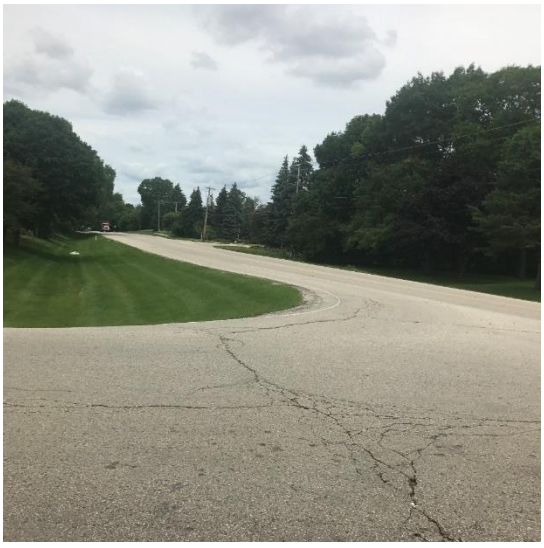

Photo 82

Looking Northbound along Racine Avenue at Sunset Drive

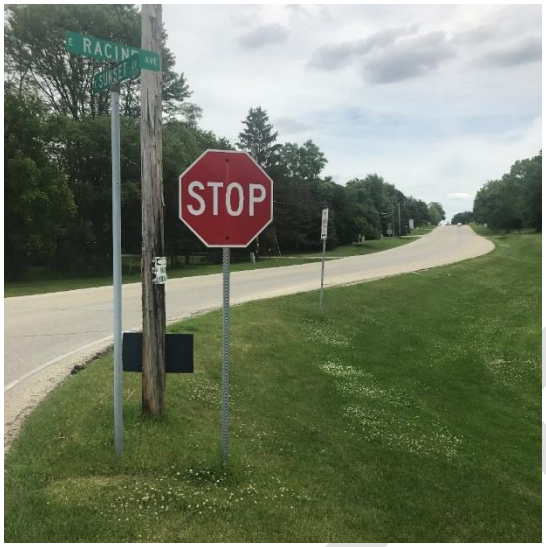

Photo 83

Looking Southbound along Racine Avenue at Sunset Drive

For the Common Corridor pipelines alignment between the convergence points on Panel 32 at the intersection Sunset Drive and Racine Avenue, and on Panel 4 at the intersection Ryan Road and 60th Street, see the respective panel descriptions in the **Water Supply Pipeline Route Description** section.

60th Street Segment

Panel 4 in the Route Alternative Panels continues from the east end of Panel 5 at approximately 500 feet west of the intersection of Ryan Road and 60th Street. As shown in this panel, 60th Street is a four-lane, two-way roadway. The land use around the route in Panel 4 is rural, with industrial areas. This panel shows the divergence point of the separate Water Supply and Return Flow Pipeline alignments from the Common Corridor alignment. The Return Flow Pipeline diverges from the Common Corridor to continue south on 60th Street. The total length of the Return Flow Pipeline within Panel 4 is approximately 2,400 feet. See Photos 18 and 19 for visual reference.

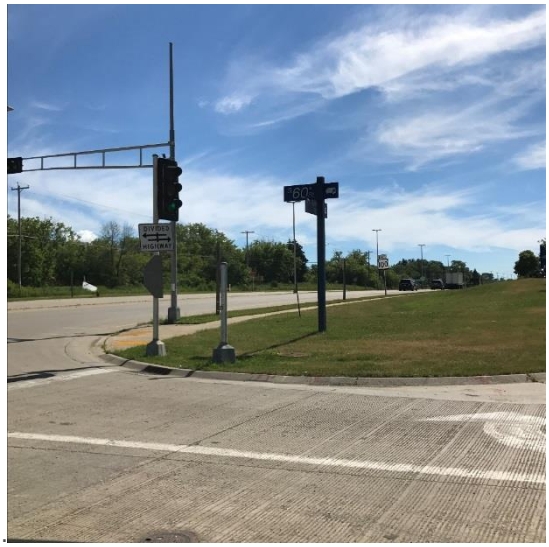

Photo 18

Looking Eastbound along Ryan Road at 60th Street

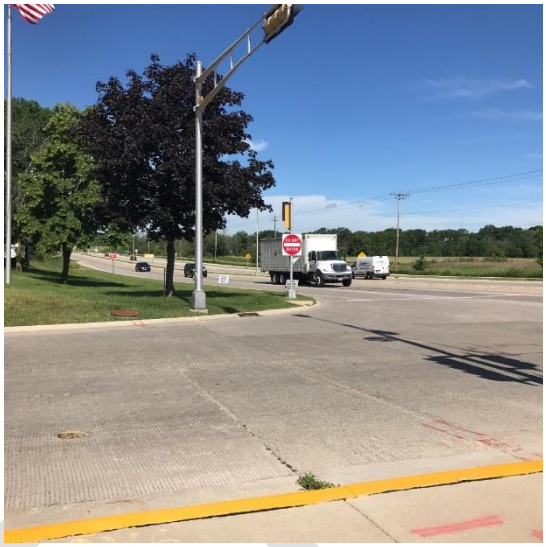

Photo 19

Looking Westbound along Ryan Road at 60th Street

Panel 43 in the Route Alternative Panels continues from the south end of Panel 4 at approximately 250 feet north of the intersection of 60th Street and Airways Avenue. As shown in this panel, 60th Street is initially a four-lane, two-way roadway, which then transitions to a two-lane, two-way roadway at the intersection with Franklin Drive. The land use around the route in Panel 43 is rural, with industrial and residential areas. The total length of the Return Flow Pipeline within Panel 43 is approximately 2,500 feet. See Photos 16 and 17 for visual reference.

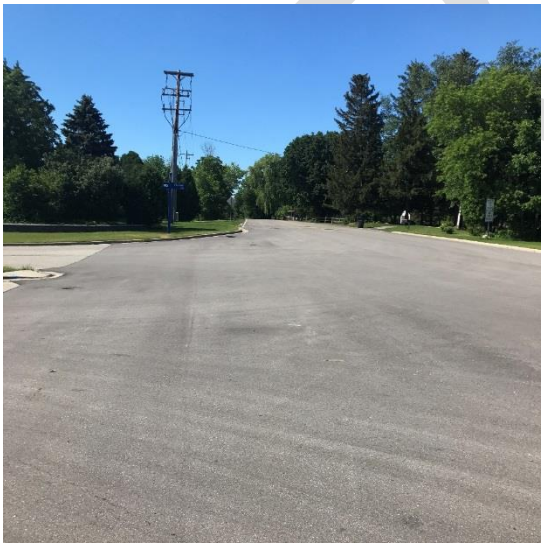

Photo 16
Looking Southbound along 60th Street at Franklin Drive

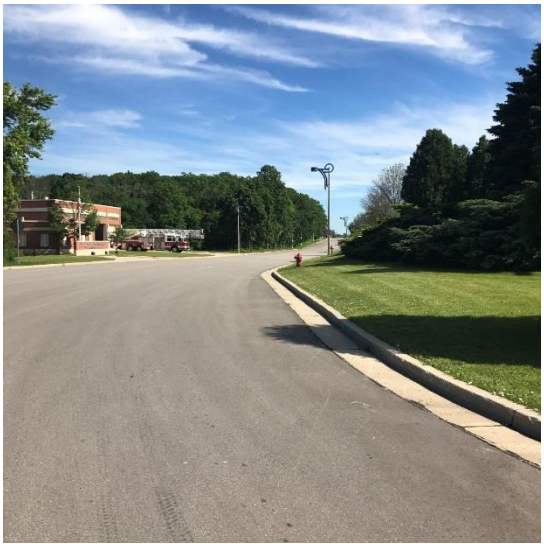

Photo 17
Looking Northbound along 60th Street at Franklin Drive

Panel 44 in the Route Alternative Panels continues from the south end of Panel 43 at approximately 1,150 feet north of the intersection of 60th Street and Oakwood Road. The land use around the route in Panel 44 is rural, with industrial, agricultural, and residential areas. The total length of the Return Flow Pipeline within Panel 44 is

approximately 1,500 feet. See Photos 13 through 15 for visual reference.

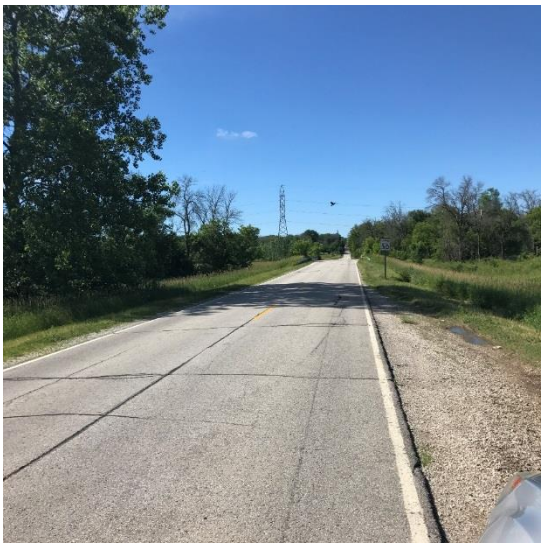

Photo 13
Looking Southbound along 60th Street at Root River

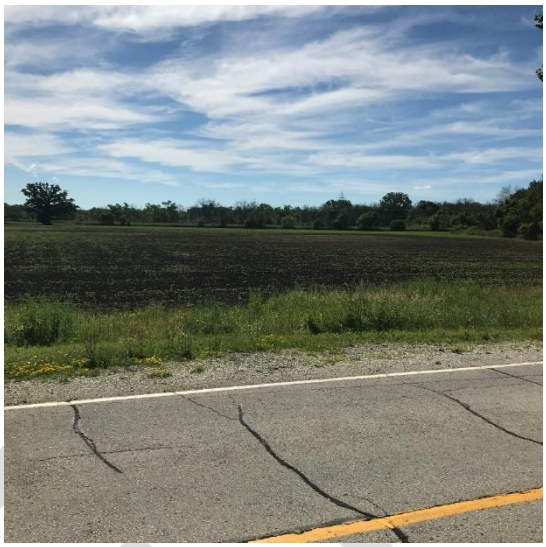

Photo 14
Looking Eastbound along 60th Street at Root River

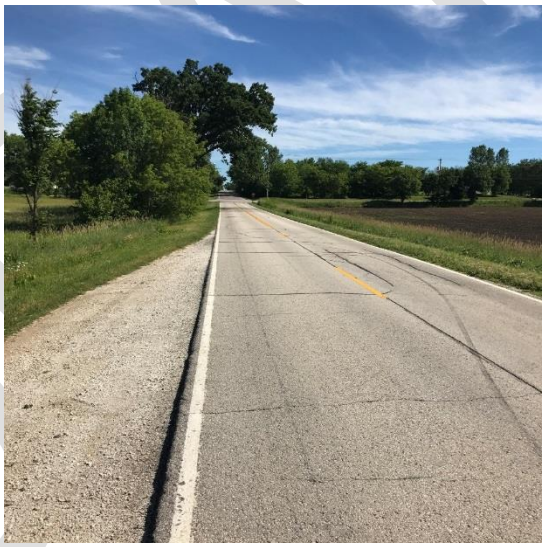

Photo 15

Looking Westbound along 60th Street at Root River

ROUTE ALTERNATIVE 3

Water Supply Pipeline Route Description (Route Alternative 3)

The narrative for the preliminary Water Supply and Return Flow Pipeline alignments of Route Alternative 3 is presented below following the flow path, beginning at the Water Supply Pipeline connection to Oak Creek and ending at the connection to WWU's distribution system. The pipeline route then follows the flow path along the Return Flow Pipeline, beginning at the CWP and ending at the Root River outfall. Segments that are either in multiple routes or within the Common Corridor on a singular route are only described once at the segment or panel that first occurs per the direction of flow. The description provides the rationale for the preliminary horizontal alignment. The photos provided for visual reference are numbered from east to west, south to north, and by time of year taken, starting at the Water Supply Pipeline connection to Oak Creek.

27th Street Segment (Cities of Oak Creek and Franklin)

Panel 1 in the Route Alternative Panels displays the beginning of the Water Supply Pipeline of Route Alternative 3. As shown in this panel, 27th Street is a four-lane, two-way divided roadway. The land use around the route in this panel is primarily rural, with residential and commercial areas. The total length of the Water Supply Pipeline within Panel 1 is approximately 2,200 feet. See Photos 6 and 7 for visual reference.

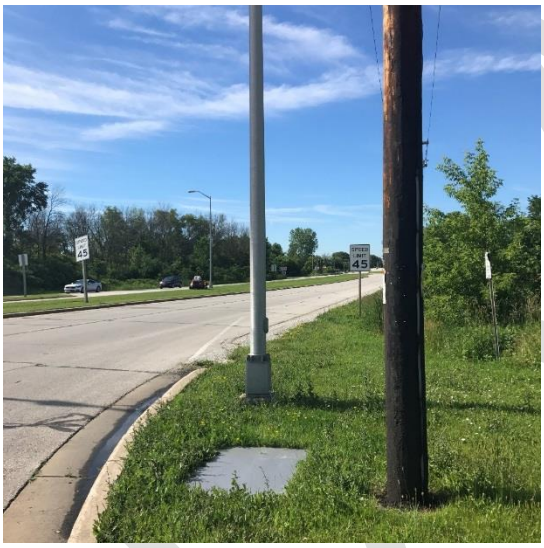

Photo 6
Looking Southbound along 27th Street

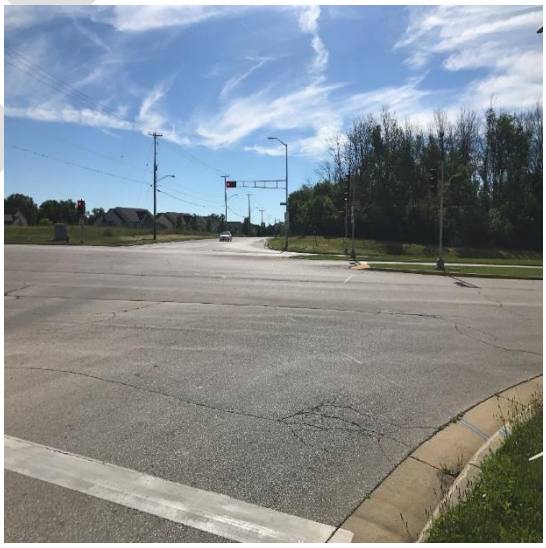

Photo 7
Looking Eastbound at the intersection of 27th Street and Puetz Road

Panel 2 in the Route Alternative Panels continues from the south end of Panel 1 at approximately 500 feet to the north of the intersection of 27th Street and West Hilltop Lane. As shown in this panel, 27th Street is a four-lane, two-way divided roadway. The land use around the route in this panel is primarily rural, with residential and commercial areas. The total length of the Water Supply Pipeline within Panel 2 is approximately 2,300 feet.

Panel 3 in the Route Alternative Panels continues from the south end of Panel 2 at approximately 1,000 feet north of the intersection of 27th Street and Ryan Road. As shown in this panel, 27th Street is a four-lane, two-way divided roadway, and Ryan Road is a six-lane, two-way roadway. The land use around the route in this panel is primarily

rural, with residential and commercial areas. The total length of the Water Supply Pipeline within Panel 3 is approximately 2,000 feet. See Photos 2 through 5 for visual reference.

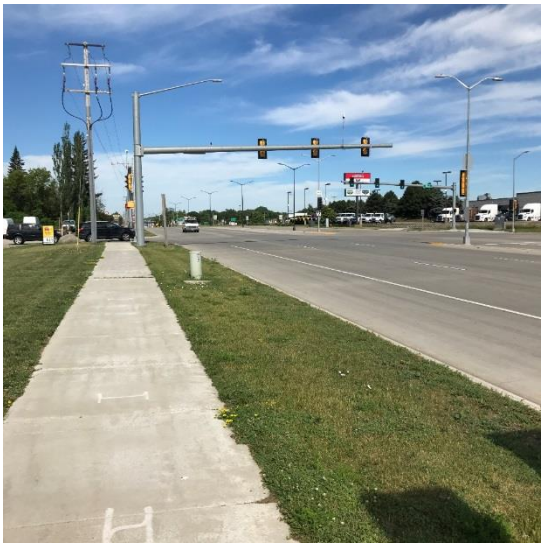

Photo 2

Looking Westbound along Ryan Road between 27th Street and 22nd Street

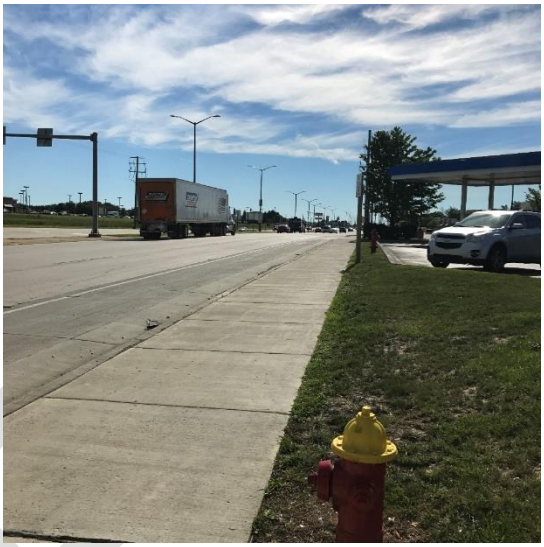

Photo 3

Looking Eastbound along Ryan Road at 27th Street

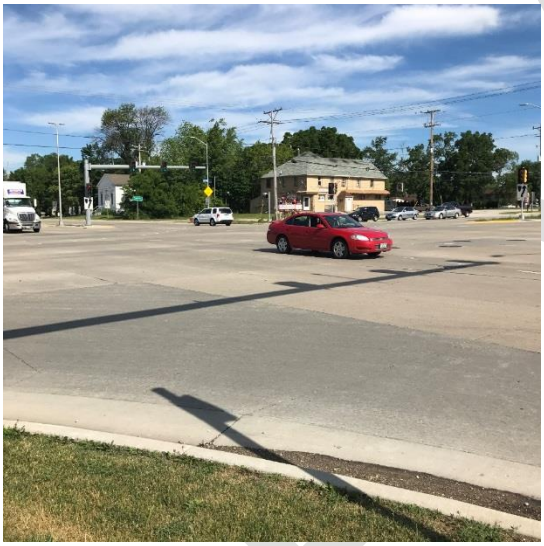

Photo 4

Looking at the intersection of Ryan Road and 27th Street

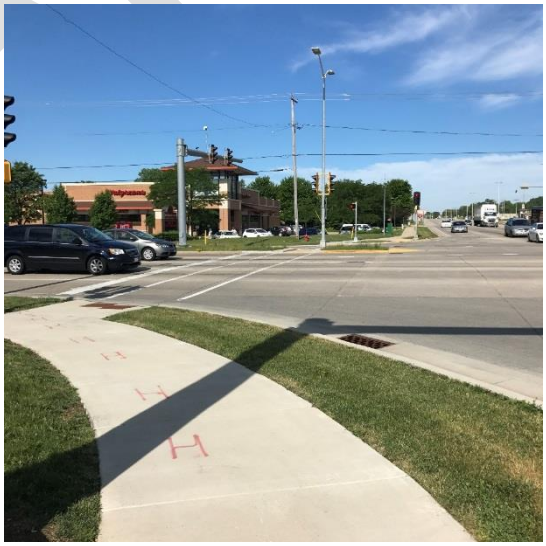

Photo 5

Looking Westbound along Ryan Road at 27th Street

Ryan Road Segment

Panel 4 in the Route Alternative Panels, refer to Panel 2 in Route Alternative 2 for description.

Panel 5 in the Route Alternative Panels, refer to Panel 3 in Route Alternative 2 for description.

Panel 6 in the Route Alternative Panels, refer to Panel 4 in Route Alternative 2 for description.

Panel 7 in the Route Alternative Panels, refer to Panel 5 in Route Alternative 2 for description.

Panel 8 in the Route Alternative Panels, refer to Panel 6 in Route Alternative 2 for description.

Panel 9 in the Route Alternative Panels, refer to Panel 7 in Route Alternative 2 for description.

Panel 10 in the Route Alternative Panels, refer to Panel 8 in Route Alternative 2 for description.

Panel 11 in the Route Alternative Panels, refer to Panel 9 in Route Alternative 2 for description.

Panel 12 in the Route Alternative Panels, refer to Panel 10 in Route Alternative 2 for description.

Cape Road Segment

Panel 13 in the Route Alternative Panels, refer to Panel 11 in Route Alternative 2 for description.

Panel 14 in the Route Alternative Panels, refer to Panel 12 in Route Alternative 2 for description.

Durham Drive Segment

Panel 15 in the Route Alternative Panels, refer to Panel 13 in Route Alternative 2 for description.

Panel 16 in the Route Alternative Panels, refer to Panel 14 in Route Alternative 2 for description.

Panel 17 in the Route Alternative Panels, refer to Panel 15 in Route Alternative 2 for description.

Panel 18 in the Route Alternative Panels, refer to Panel 16 in Route Alternative 2 for description.

Moorland Road Segment

Panel 19 in the Route Alternative Panels, refer to Panel 17 in Route Alternative 2 for description.

Panel 20 in the Route Alternative Panels, refer to Panel 18 in Route Alternative 2 for description.

Panel 21 in the Route Alternative Panels, refer to Panel 19 in Route Alternative 2 for description.

Panel 22 in the Route Alternative Panels, refer to Panel 20 in Route Alternative 2 for description.

Panel 23 in the Route Alternative Panels, refer to Panel 21 in Route Alternative 2 for description.

Small Road / Interstate 43 Segment

Panel 24 in the Route Alternative Panels continues from the north end of Panel 23 at approximately 330 feet northwest of the intersection of Westridge Drive and Moorland Road. As shown in this panel, Westridge Drive is a

two-lane, two-way roadway. The land use around the route in Panel 24 is a mix of rural, agricultural, commercial and residential areas. The point at which the pipelines cross Interstate 43, a jack and bore method is being considered to install approximately 500 linear feet of pipe casing is. This method of construction is being considered to minimize impacts to Interstate 43. Refer to Panel 22 in Route Alternative 2 for visual reference. The construction within Parcel NBC 1286999002 would require a 50-foot permanent easement and a 15-foot temporary easement. The total length of the Water Supply Pipeline within Panel 24 is approximately 5,400 feet. See Photos 51 and 52 for visual reference.

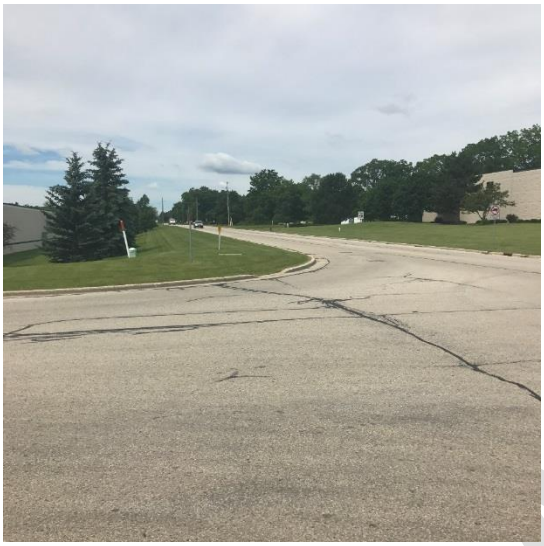

Photo 51

Looking Westbound along Small Road at Westridge Drive

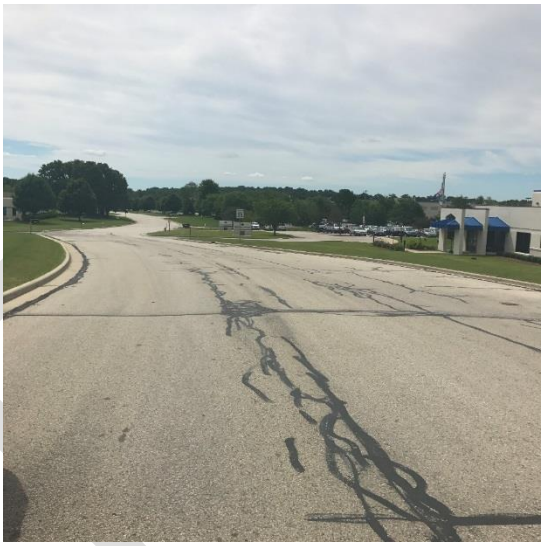

Photo 52

Looking Southbound along Westridge Drive at Small Road

Panel 25 in the Route Alternative Panels continues from the west end of Panel 24 at approximately 1,120 feet northeast from the point at which Interstate 43 crosses over Calhoun Road. The land use around the route in Panel 25 is primarily rural and natural open areas. The total length of the Common Corridor within Panel 25 is approximately 3,000 feet.

Panel 26 in the Route Alternative Panels continues from the west end of Panel 25 at approximately 3,320 feet northeast from the point at which Interstate 43 crosses over Martin Road. The land use around the route in Panel 26 is primarily rural and natural open areas. Approximately 1,200 feet southwest from the point at which Interstate 43 crosses over Calhoun Road, a trenchless construction method of HDD is being considered to install approximately 320 linear feet of pipe. This method of construction is being considered to minimize impact to the creek. The total length of the Common Corridor within Panel 26 is approximately 3,500 feet. See Photos 117 and 118 for visual reference.

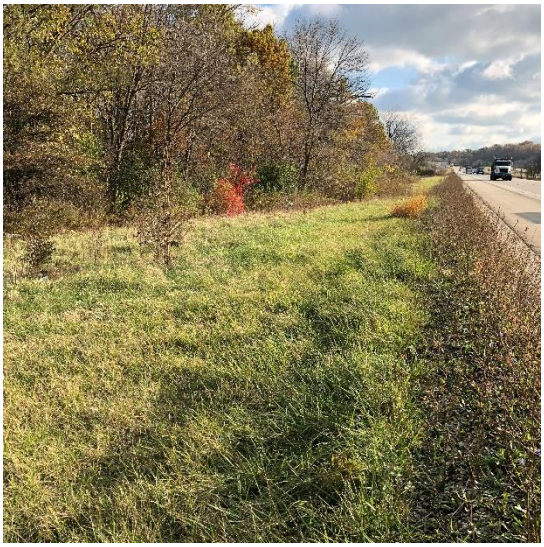

Photo 117

Looking Southbound along Interstate 43

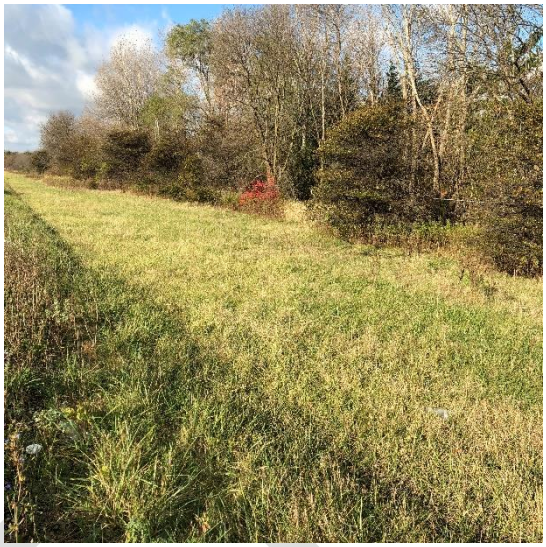

Photo 118

Looking Northbound along Interstate 43

Panel 27 in the Route Alternative Panels continues from the west end of Panel 26 at approximately 3,360 feet northeast of the interchange of Interstate 43 and Racine Avenue. As shown in this panel, Racine Avenue is a four-lane, divided two-way roadway. The land use around the route in Panel 27 is primarily rural and natural open areas. Approximately 1,400 feet northeast of the northern interchange of Interstate 43 with Racine Avenue, a trenchless construction method of HDD is being considered to install approximately 300 linear feet of pipe. This method is being considered to avoid impacts to wetlands. Immediately prior to the northern interchange of Interstate 43 with Racine Avenue, 200 linear feet of pipe casing is being considered to be installed using a jack and bore method. This method of construction is being considered to minimize traffic disruption at the interchange. The total length of the Common Corridor within Panel 27 is approximately 5,200 feet. See Photos 119 through 122 for visual reference.

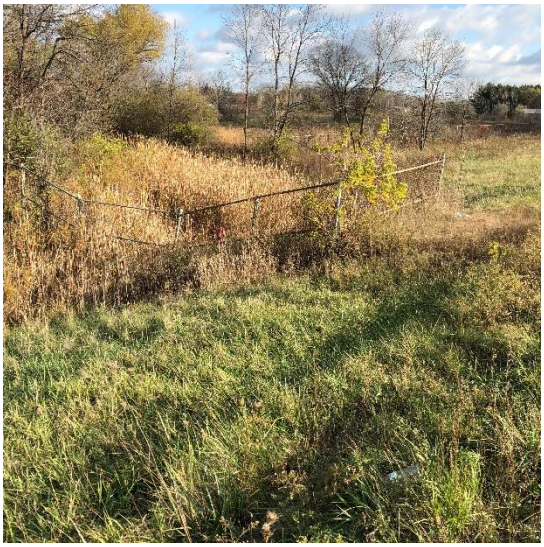

Photo 119

Looking Southbound along Interstate 43

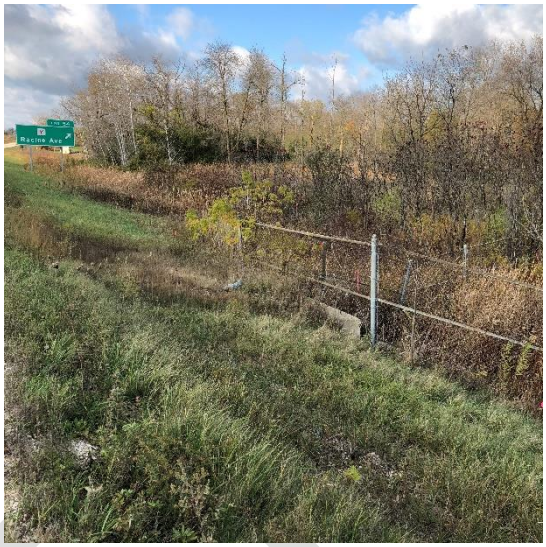

Photo 120

Looking Northbound along Interstate 43

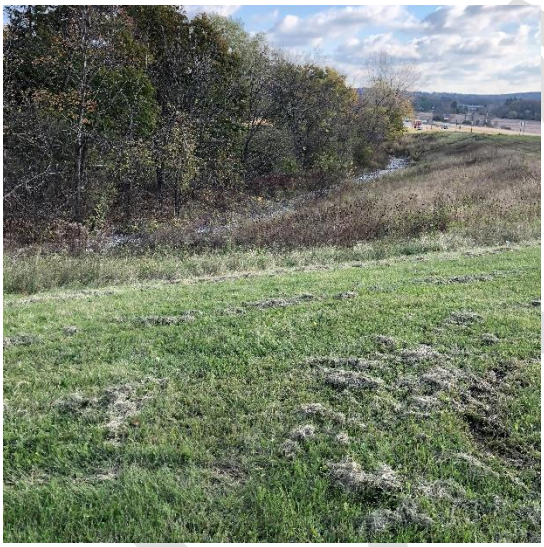

Photo 121

Looking Southbound along Interstate 43

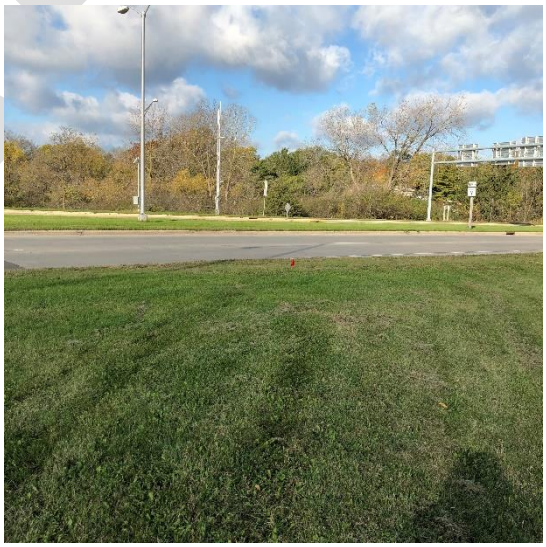

Photo 122

Looking east along Racine Avenue at Interstate 43

Racine Avenue Segment

Panel 28 in the Route Alternative Panels continues from the north end of Panel 27 at approximately 1,170 feet north of the northern interchange of Interstate 43 with Racine Avenue. As shown in this panel, Racine Avenue is a four-lane, divided two-way roadway. The land use around the route in Panel 28 is primarily rural, with residential areas. The total length of the Common Corridor within Panel 28 is approximately 1,900 feet.

Panel 29 in the Route Alternative Panels continues from the north end of Panel 28 at approximately 500 feet south from the point at which National Avenue crosses over Racine Avenue. As shown in this panel, Racine Avenue is a four-lane, divided two-way roadway. The land use around the route in Panel 29 is primarily rural, with residential areas. The total length of the Common Corridor within Panel 29 is approximately 1,900 feet.

Panel 30 in the Route Alternative Panels continues from the north end of Panel 29 at approximately 1,760 feet north from the point at which National Avenue crosses over Racine Avenue. As shown in this panel, Racine Avenue is a four-lane, two-way roadway. The land use around the route in Panel 30 is primarily rural, with residential areas. The total length of the Common Corridor within Panel 30 is approximately 1,900 feet.

Panel 31 in the Route Alternative Panels continues from the north end of Panel 30 at approximately 1,000 feet south from the intersection of Racine Avenue and Lawnsdale Road. As shown in this panel, Racine Avenue is a four-lane, two-way roadway. The land use around the route in Panel 31 is primarily rural, with residential areas. The total length of the Common Corridor within Panel 31 is approximately 2,200 feet. See Photos 67 and 68 for visual reference.

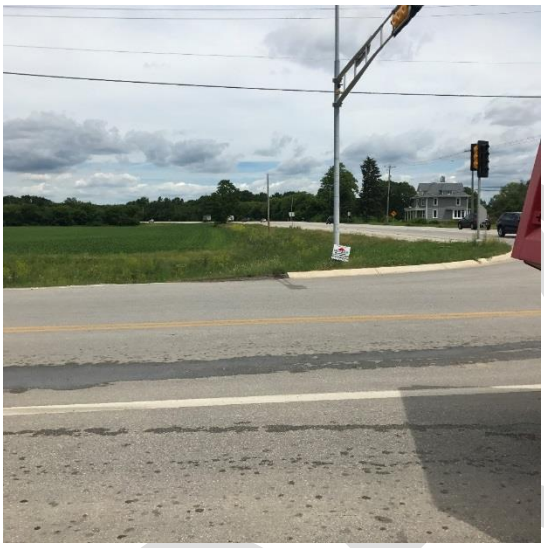

Photo 67

Looking Northbound along Racine Avenue at Lawnsdale Road

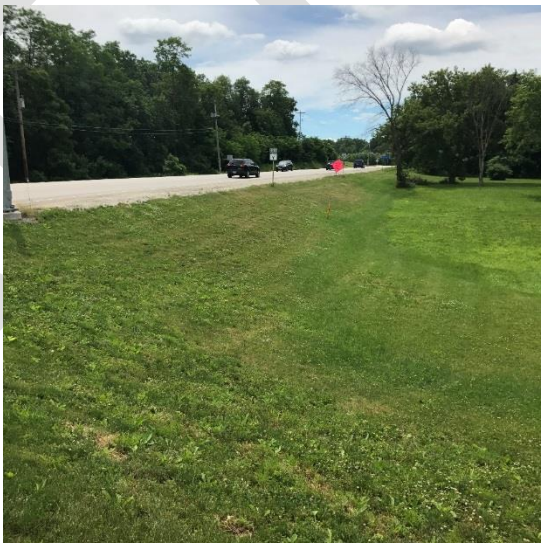

Photo 68

Looking Southbound along Racine Avenue at Lawnsdale Road

Panel 32 in the Route Alternative Panels, refer to Panel 28 in Route Alternative 2 for description.

Panel 33 in the Route Alternative Panels, refer to Panel 29 in Route Alternative 2 for description.

Panel 34 in the Route Alternative Panels, refer to Panel 30 in Route Alternative 2 for description.

Panel 35 in the Route Alternative Panels, refer to Panel 31 in Route Alternative 2 for description.

Panel 36 in the Route Alternative Panels, refer to Panel 32 in Route Alternative 2 for description.

Panel 37 in the Route Alternative Panels, refer to Panel 33 in Route Alternative 2 for description.

Return Flow Pipeline Route Description (Route Alternative 3)

Sentry Drive Segment

Panel 38 in the Route Alternative Panels, refer to Panel 34 in Route Alternative 2 for description.

Panel 39 in the Route Alternative Panels, refer to Panel 35 in Route Alternative 2 for description.

Sunset Drive Segment

Panel 40 in the Route Alternative Panels, refer to Panel 36 in Route Alternative 2 for description.

Panel 41 in the Route Alternative Panels, refer to Panel 37 in Route Alternative 2 for description.

West Avenue Segment

Panel 42 in the Route Alternative Panels, refer to Panel 38 in Route Alternative 2 for description.

Route 59 Segment

Panel 43 in the Route Alternative Panels, refer to Panel 39 in Route Alternative 2 for description.

Panel 44 in the Route Alternative Panels, refer to Panel 40 in Route Alternative 2 for description.

Panel 45 in the Route Alternative Panels, refer to Panel 41 in Route Alternative 2 for description.

Sunset Drive Segment

Panel 46 in the Route Alternative Panels, refer to Panel 42 in Route Alternative 2 for description.

Panel 36 in the Route Alternative Panels, refer to Panel 32 in Route Alternative 2 for description.

For the Common Corridor pipeline alignments between the convergence points on Panel 36 at the intersection Sunset Drive and Racine Avenue, and on Panel 6 at the intersection Ryan Road and 60th Street, see the respective panel descriptions in the **Water Supply Pipeline Route Description** section.

60th Street Segment

Panel 6 in the Route Alternative Panels, refer to Panel 4 in Route Alternative 2 for description.

Panel 47 in the Route Alternative Panels, refer to Panel 43 in Route Alternative 2 for description.

Panel 48 in the Route Alternative Panels, refer to Panel 44 in Route Alternative 2 for description.

ROUTE ALTERNATIVE 4

Water Supply Pipeline Route Description (Route Alternative 4)

The narrative for the preliminary Water Supply and Return Flow Pipeline alignments of Route Alternative 4 is presented below following the flow path, beginning at the Water Supply Pipeline connection to Oak Creek and ending at the connection to WWU's distribution system. The pipeline route then follows the flow path along the Return Flow Pipeline, beginning at the CWP and ending at the Root River outfall. Segments that are either in multiple routes or within the Common Corridor on a singular route are only described once at the segment or panel that first occurs per the direction of flow. The description provides the rationale for the preliminary horizontal alignment. The photos provided for visual reference are numbered from east to west, south to north, and by time of year taken, starting at the Water Supply Pipeline connection to Oak Creek.

Ryan Road Segment (Cities of Oak Creek and Franklin)

Panel 1 in the Route Description Panels displays the beginning of the Route Alternative 4 Water Supply Pipeline. Refer to Panel 1 in Route Alternative 2 for description.

Panel 2 in the Route Alternative Panels, refer to Panel 2 in Route Alternative 2 for description.

Panel 3 in the Route Alternative Panels, refer to Panel 3 in Route Alternative 2 for description.

Panel 4 in the Route Alternative Panels, refer to Panel 4 in Route Alternative 2 for description.

Panel 5 in the Route Alternative Panels, refer to Panel 5 in Route Alternative 2 for description.

Panel 6 in the Route Alternative Panels, refer to Panel 6 in Route Alternative 2 for description.

Panel 7 in the Route Alternative Panels, refer to Panel 7 in Route Alternative 2 for description.

Panel 8 in the Route Alternative Panels, refer to Panel 8 in Route Alternative 2 for description.

Panel 9 in the Route Alternative Panels, refer to Panel 9 in Route Alternative 2 for description.

Panel 10 in the Route Alternative Panels, refer to Panel 10 in Route Alternative 2 for description.

Cape Road Segment

Panel 11 in the Route Alternative Panels, refer to Panel 11 in Route Alternative 2 for description.

Panel 12 in the Route Alternative Panels, refer to Panel 12 in Route Alternative 2 for description.

Durham Drive Segment

Panel 13 in the Route Alternative Panels, refer to Panel 13 in Route Alternative 2 for description.

Panel 14 in the Route Alternative Panels, refer to Panel 14 in Route Alternative 2 for description.

Panel 15 in the Route Alternative Panels continues from the north end of Panel 14 at approximately 950 feet northwest of the intersection of Durham Drive and Hi View Drive. As shown in this panel, Durham Drive is a two-lane, two-way roadway. The land use around the route in Panel 15 is primarily rural, with residential and agricultural areas. The total length of the Common Corridor within Panel 15 is approximately 3,500 feet.

City of Muskego Recreational Trail Segment

Panel 16 in the Route Alternative Panels continues from the west end of Panel 15 approximately 1,050 feet west of the intersection of Durham Drive and City of Muskego Recreational Trail. The land use around the route in Panel 16 is primarily rural, with residential areas. The total length of the Common Corridor within Panel 16 is approximately 3,300 feet.

Panel 17 in the Route Alternative Panels continues from the west end of Panel 16 at approximately 1,650 feet west of the point at which the City of Muskego Recreational Trail crosses Mystic Drive. The land use around the route in Panel 17 is primarily rural, with residential areas. The total length of the Common Corridor within Panel 17 is approximately 3,300 feet.

Panel 18 in the Route Alternative Panels continues from the west end of Panel 17 at approximately 875 feet west of the point at which the City of Muskego Recreational Trail crosses Woods Drive (See Panel 17). The land use around the route in Panel 18 is primarily rural, with residential areas. The total length of the Common Corridor within Panel 18 is approximately 3,300 feet.

Panel 19 in the Route Alternative Panels continues from the west end of Panel 18 at approximately 1,400 feet west of the point at which the City of Muskego Recreational Trail crosses Lennon Drive. The land use around the route in Panel 19 is primarily rural, with residential areas. The total length of the Common Corridor within Panel 19 is approximately 3,400 feet. See Photos 56 through 59 for visual reference.

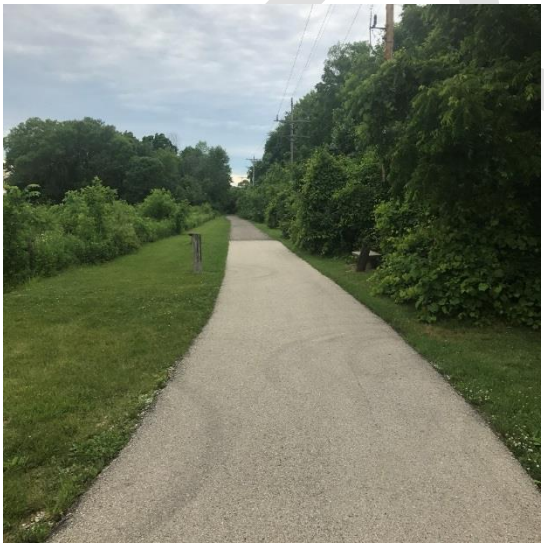

Photo 56

Looking Westbound along City of Muskego Recreational Trail

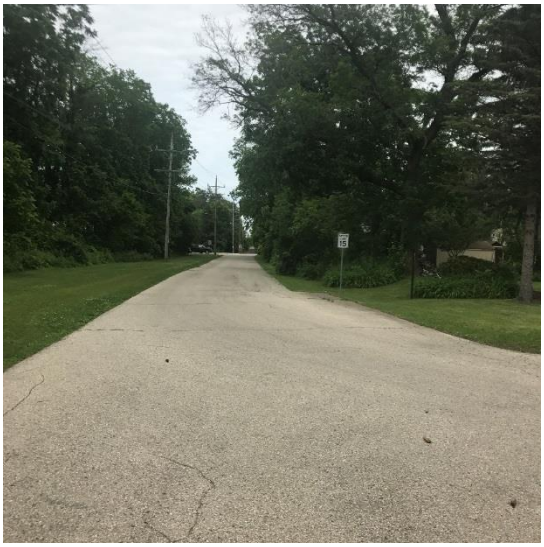

Photo 57

Looking Eastbound along City of Muskego Recreational Trail

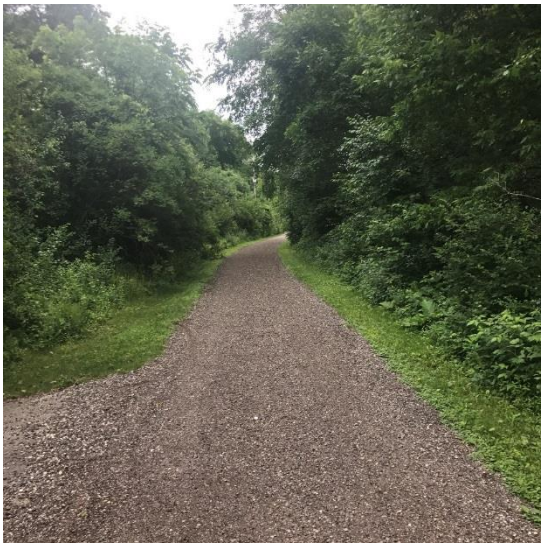

Photo 58
Looking along City of Muskego Recreational Trail

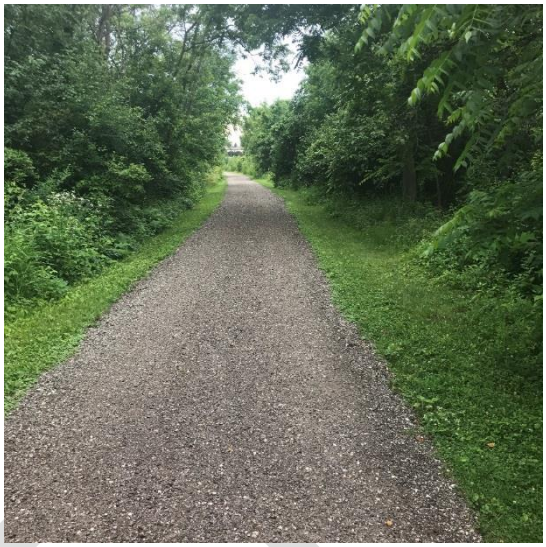

Photo 59
Looking along City of Muskego Recreational Trail

Racine Avenue Segment

Panel 20 in the Route Alternative Panels continues from the west end of Panel 19 at approximately 1,680 feet west of the point at which the City of Muskego Recreational Trail crosses Pioneer Drive (See Panel 19). As shown in this panel, Racine Avenue is a four-lane, two-way roadway. The land use around the route in Panel 20 is rural, with commercial and residential areas. A jack and bore method is being considered to install approximately 370 linear feet of casing is being considered to be installed. This construction method is being considered to minimize traffic disruption on Janesville Road. The total length of the Common Corridor within Panel 20 is approximately 3,000 feet. See Photo 60 through 63 for visual reference.

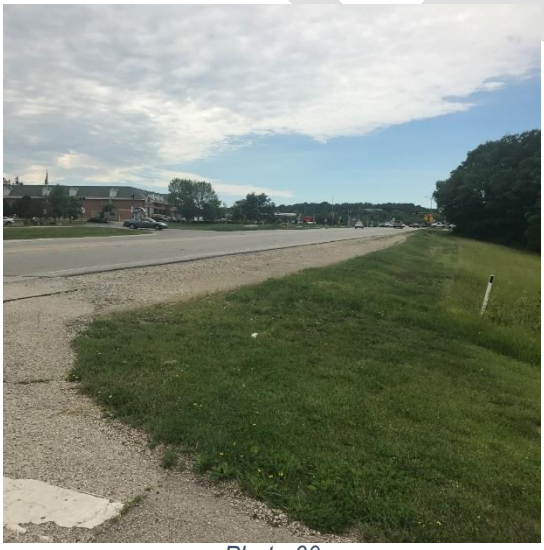

Photo 60
Looking Northbound along Racine Avenue at City of Muskego Recreational Trail

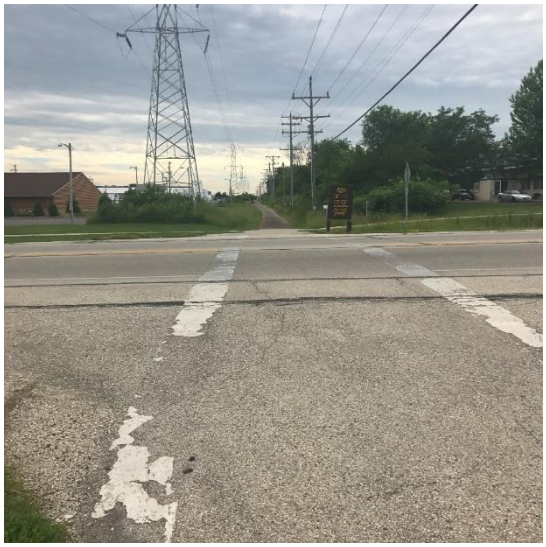

Photo 61
Looking Westbound along City of Muskego Recreational Trail at Racine Avenue

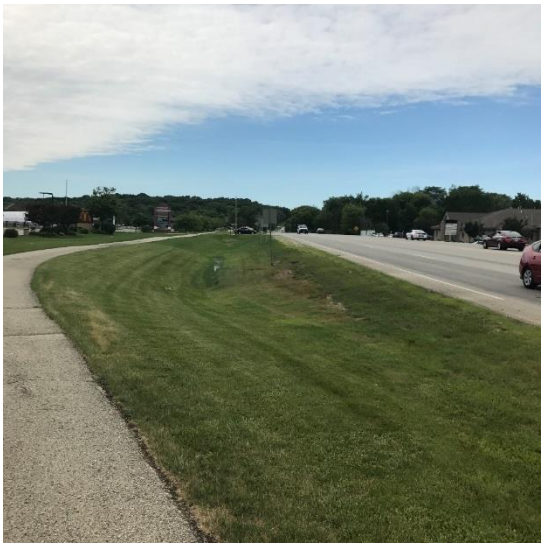

Photo 62
Looking Northbound along Racine Avenue at Janesville Road

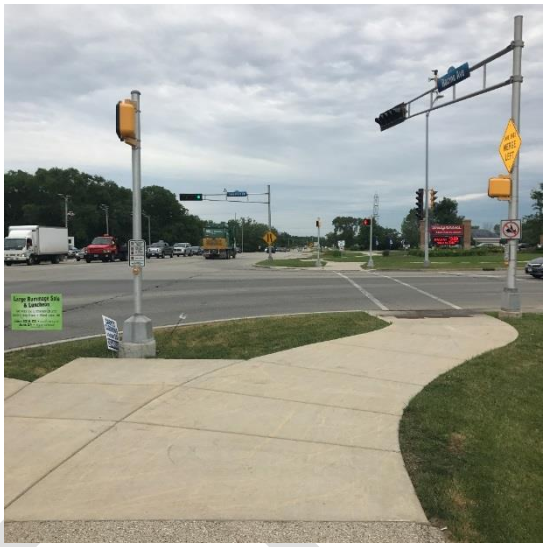

Photo 63
Looking Southbound along Racine Avenue at Janesville Road

Panel 21 in the Route Alternative Panels continues from the north end of Panel 20 at approximately 1,575 feet northwest of the intersection of Janesville Road and Racine Avenue. As shown in this panel, Racine Avenue is a two-lane, two-way roadway. The land use around the route in Panel 21 is rural, with commercial and residential areas. The total length of the Common Corridor within Panel 21 is approximately 2,700 feet.

Panel 22 in the Route Alternative Panels continues from the north end of Panel 21 at approximately 700 feet southeast of the intersection of Racine Avenue and Hillendale Drive. As shown in this panel, Racine Avenue is a two-lane, two-way roadway. The land use around the route in Panel 22 is rural, with agricultural and residential areas. The total length of the Common Corridor within Panel 22 is approximately 2,300 feet.

Panel 23 in the Route Alternative Panels continues from the north end of Panel 22 at approximately 1,630 feet north of the intersection of Racine Avenue and Hillendale Drive. As shown in this panel, Racine Avenue and Tans Drive are two-lane, two-way roadways. The land use around the route in Panel 23 is primarily rural, with residential areas. The total length of the Common Corridor within Panel 23 is approximately 5,000 feet. See Photos 64 through 66 for visual reference.

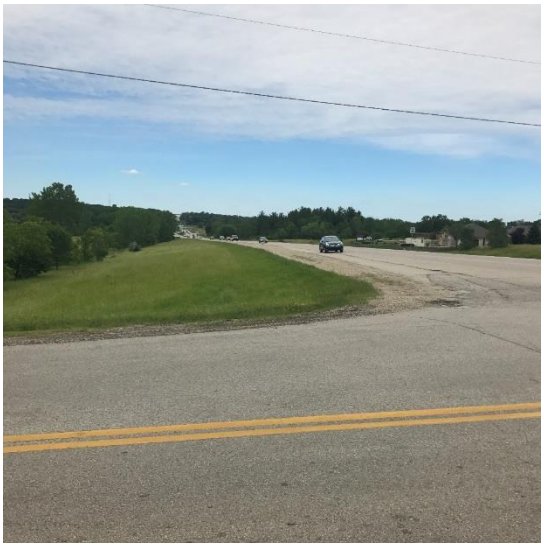

Photo 64
Looking Northbound along Racine Avenue at Tans Drive

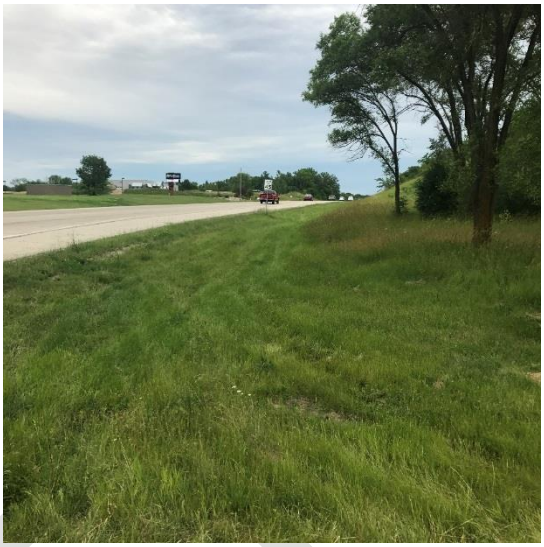

Photo 65
Looking Southbound along Racine Avenue at Tans Drive

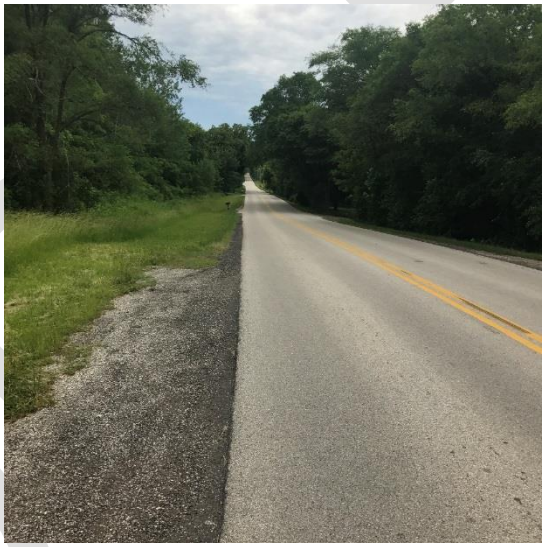

Photo 66
Looking Westbound along Tans Drive at Racine Avenue

Tans Drive Segment

Panel 24 in the Route Alternative Panels continues from the north end of Panel 23 at approximately 2,485 feet west of the intersection of Racine Avenue and Tans Drive. As shown in this panel, Tans Drive is a two-lane, two-way roadway. The land use around the route in Panel 24 is rural, with residential areas. The total length of the Common Corridor within Panel 24 is approximately 3,600 feet.

Crowbar Drive Segment

Panel 25 in the Route Alternative Panels continues from the west end of Panel 24. The land use around the route in Panel 25 is rural and agricultural with residential. Approximately 6 feet to the north of the intersection of Tans Drive and Crowbar Drive, a jack and bore method is being considered to install approximately 630 linear feet of pipe casing. The total length of the Common Corridor within Panel 25 is approximately 3,800 feet. See Photos 71 through 74 for reference.

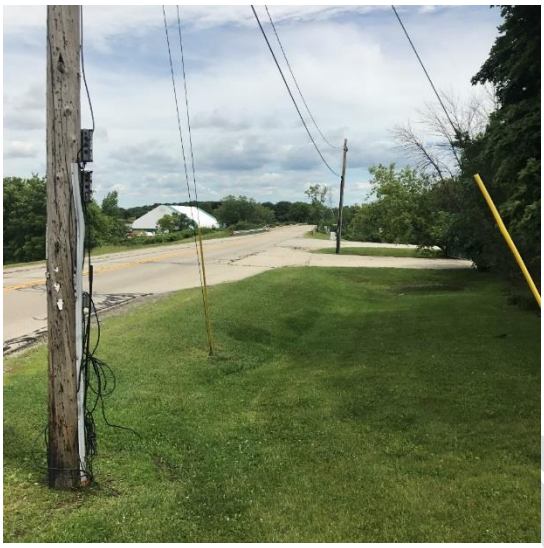

Photo 71
Looking Northbound along Crowbar Drive at Tans Drive

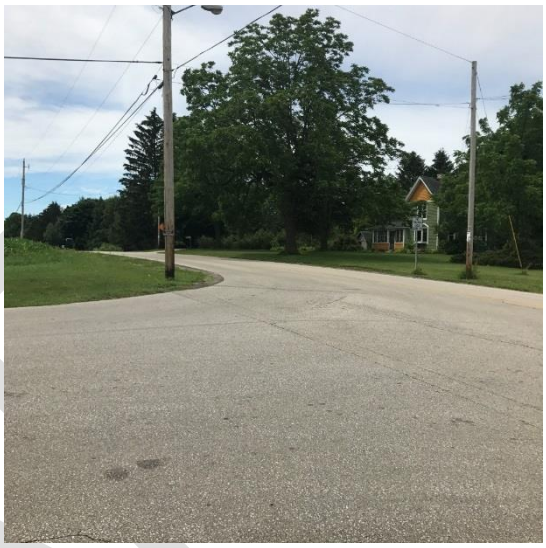

Photo 72
Looking Southbound along Crowbar Drive at Tans Drive

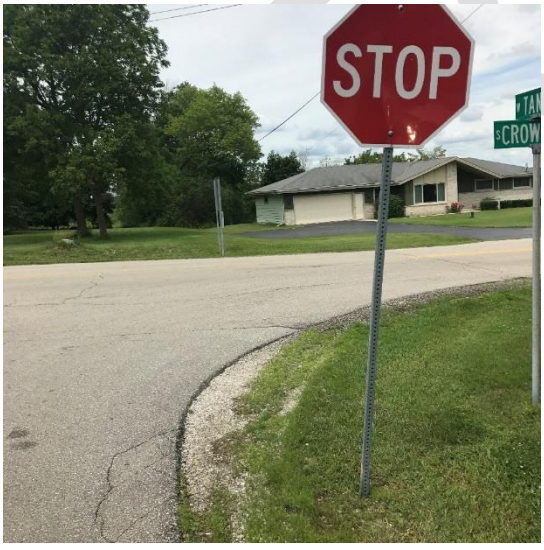

Photo 73
Looking Westbound along Tans Drive at Crowbar Drive

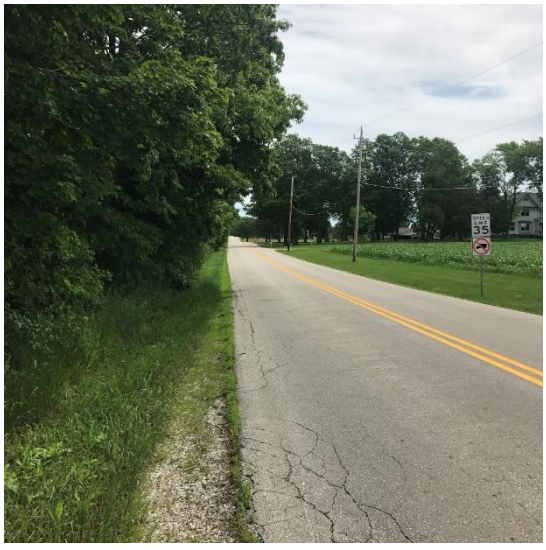

Photo 74
Looking Eastbound along Tans Drive at Crowbar Drive

Parcels NBC 2182999006, VNT 2017999, 2017998 and VNT 2017996 Segment

Panel 26 in the Route Alternative Panels continues from the north end of Panel 25. The land use around the route in Panel 26 is primarily rural, with agricultural and residential areas. The total length of the Common Corridor within Panel 26 is approximately 3,400 feet. See Photos 75 through 80 for reference.

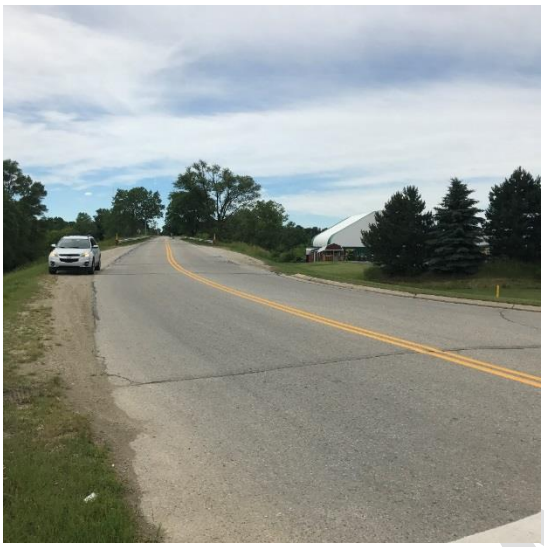

Photo 75
Looking Southbound along Crowbar Drive at National Avenue

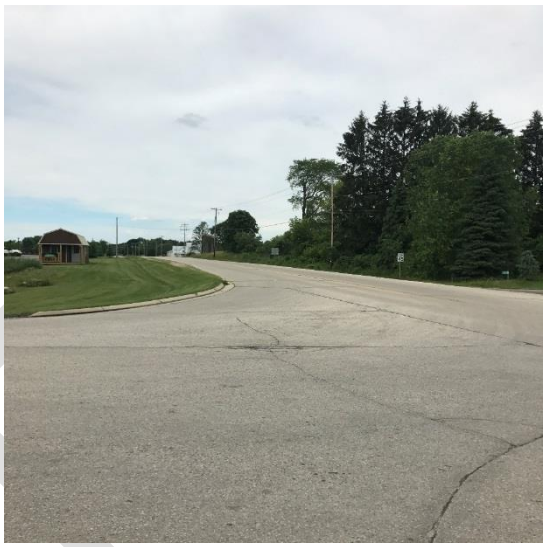

Photo 76
Looking Westbound along National Avenue at Crowbar Drive

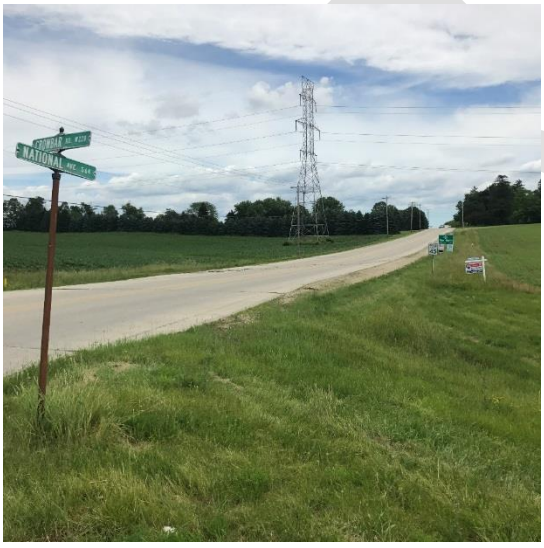

Photo 77
Looking Eastbound along National Avenue at Crowbar Drive

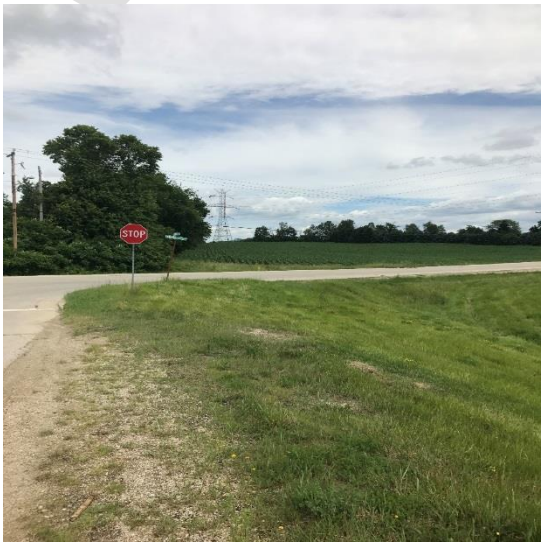

Photo 78
Looking Northbound along Crowbar Drive at National Avenue

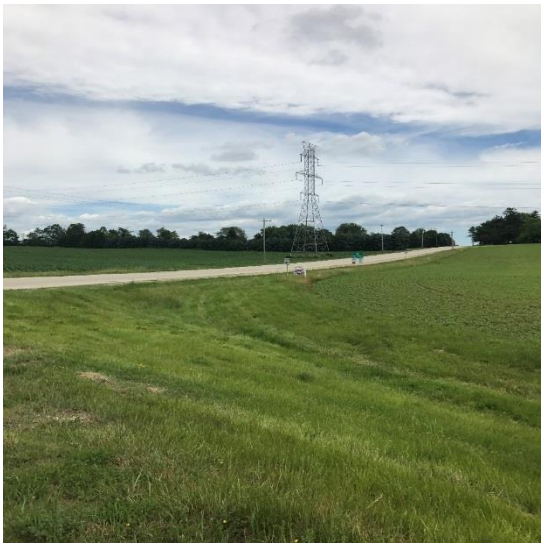

Photo 79
Looking Eastbound along National Avenue at Crowbar Drive

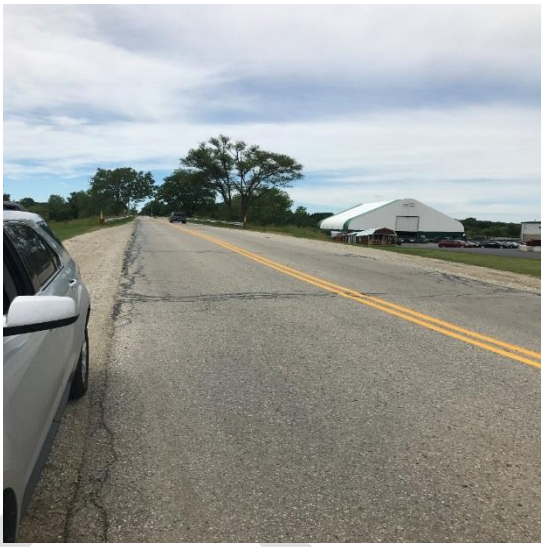

Photo 80
Looking Southbound along Crowbar Drive

Town Line Road Segment

Panel 27 in the Route Alternative Panels continues from the west end of Panel 26 at approximately 750 feet east of the intersection of Town Line Road and Guthrie Road. As shown in this panel, Town Line Road is a two-lane, two-way roadway. The land use around the route in Panel 27 is primarily rural, with agricultural and residential areas. The total length of the Common Corridor within Panel 27 is approximately 3,300 feet. See Photos 84 through 86 for visual reference.

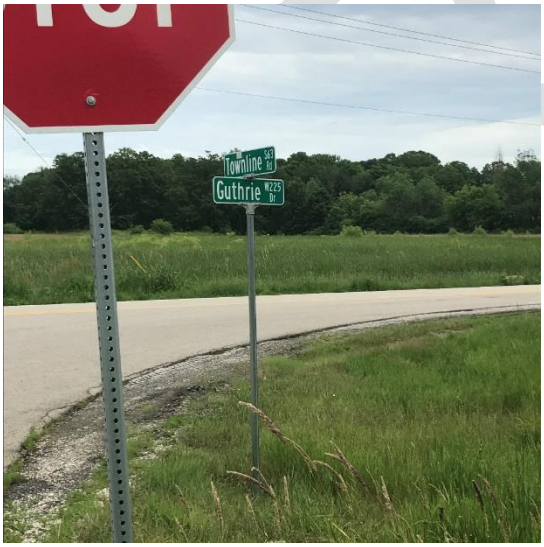

Photo 84

Looking Southbound along Guthrie Road at Town Line Road

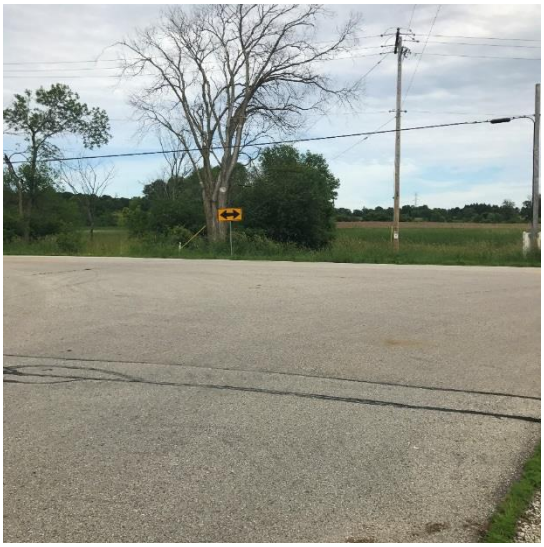

Photo 85

Looking Eastbound along Town Line Road at Guthrie Road

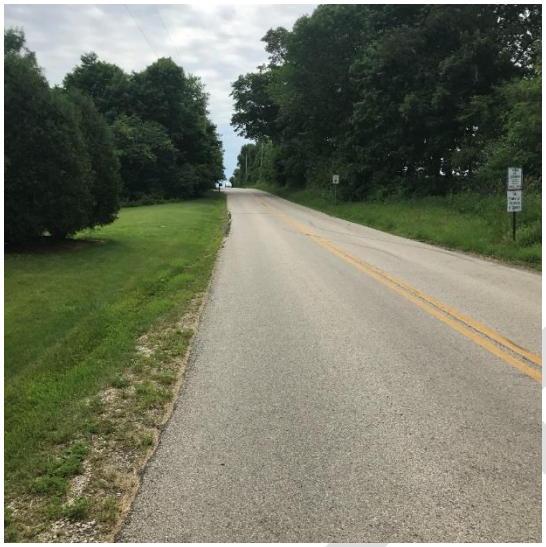

Photo 86
Looking Westbound along Town Line Road at Guthrie Road

Panel 28 in the Route Alternative Panels continues from the west end of Panel 27 at approximately 795 feet west of the intersection of Town Line Road and Garrett Drive. As shown in this panel, Town Line Road is a two-lane, two-way roadway. The land use around the route in Panel 28 is rural, with agricultural and residential areas. The total length of the Common Corridor within Panel 28 is approximately 3,300 feet. See Photos 92 and 93 for visual reference.

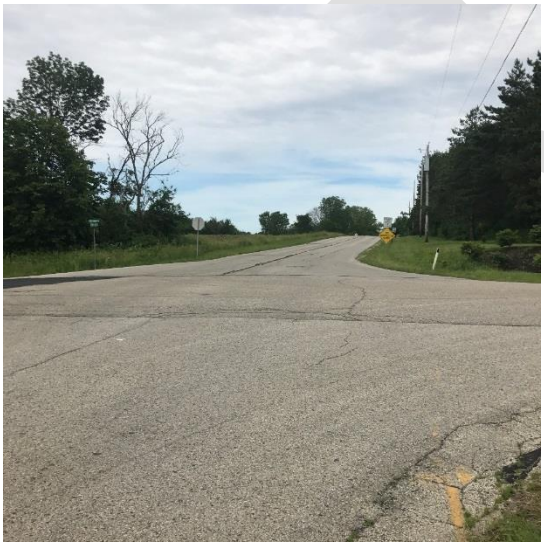

Photo 92

Looking Eastbound along Town Line Road at Big Bend Road

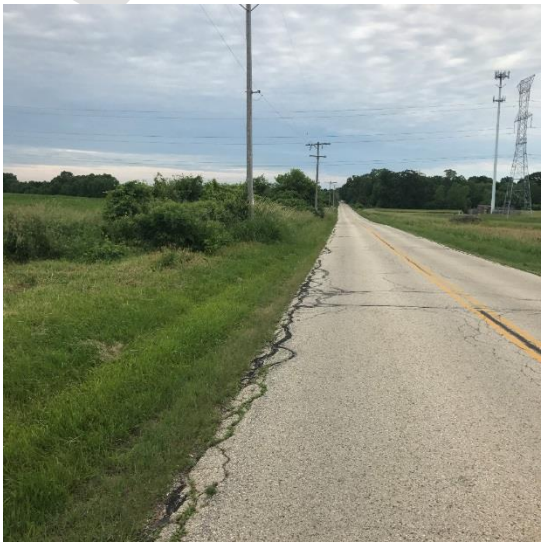

Photo 93

Looking Westbound along Town Line Road at Big Bend Road

Route 164 Segment

Panel 29 in the Route Alternative Panels continues from the west end of Panel 28 at approximately 2,680 feet east of the intersection of Town Line Road and Route 164. As shown in this panel, Town Line Road is a two-lane, two-way roadway and Route 164 is a four-lane, divided two-way roadway. The land use around the route in Panel 29 is rural, with agricultural and residential areas. At the intersection of Town Line Road and Route 164, a jack and bore method is being considered to install 150 linear feet of pipe casing. This construction method is being considered to minimize traffic disruption at the intersection of Town Line Road and Route 164. The total length of the Common Corridor within Panel 29 is approximately 4,400 feet. See Photos 94 and 95 for visual reference.

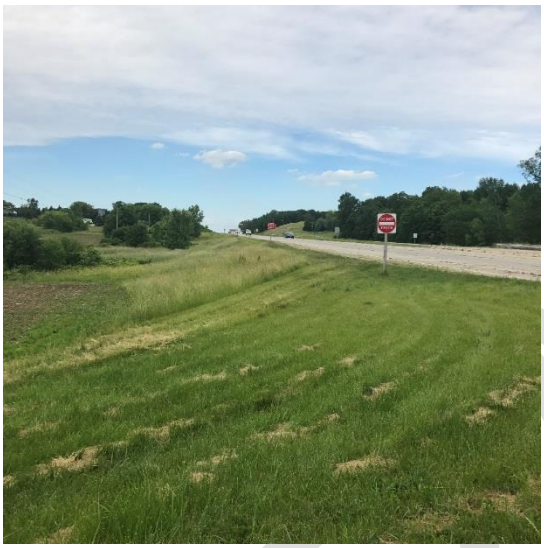

Photo 94

Looking Northbound along Route 164 at Town Line Road

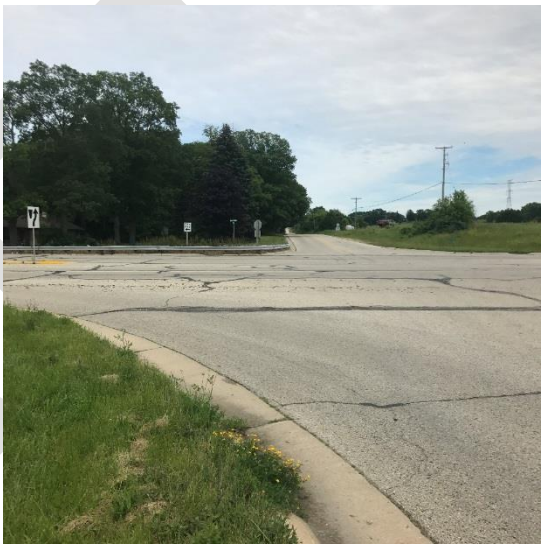

Photo 95

Looking Eastbound along Town Line Road at Route 164

Panel 30 in the Route Alternative Panels continues from the north end of Panel 29. As shown in this panel, Route 164 is a four-lane, divided two-way roadway. The land use around the route in Panel 30 is rural, with agricultural and residential areas. The total length of the Common Corridor within Panel 30 is approximately 2,300 feet.

Panel 31 in the Route Alternative Panels continues from the north end of Panel 30. As shown in this panel, Route 164 is a four-lane, divided two-way roadway. The land use around the route in Panel 31 is rural, with agricultural and residential areas. The total length of the Common Corridor within Panel 31 is approximately 2,300 feet.

Panel 32 in the Route Alternative Panels continues from the north end of Panel 31. As shown in this panel, Route 164 is a four-lane, divided two-way roadway. The land use around the route in Panel 32 is rural, with agricultural, commercial, and residential areas. The total length of the Common Corridor within Panel 32 is approximately 2,300 feet.

Panel 33 in the Route Alternative Panels continues from the north end of Panel 32. As shown in this panel, Route 164 is a four-lane, divided two-way roadway. The land use around the route in Panel 33 is rural, with agricultural, commercial, and residential areas. Approximately 1,350 feet south from the intersection of Route 164 and Lawnsdale

Road, a trenchless construction method of HDD is being considered to install approximately 350 linear feet of pipeline. This construction method is used to minimize impact to the creek. The total length of the Common Corridor within Panel 33 is approximately 2,300 feet. See Photos 125 and 126 for visual reference.

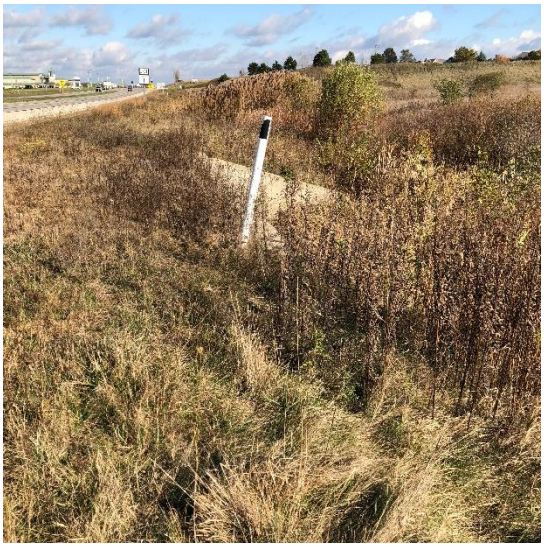

Photo 125

Looking Northbound along Route 164

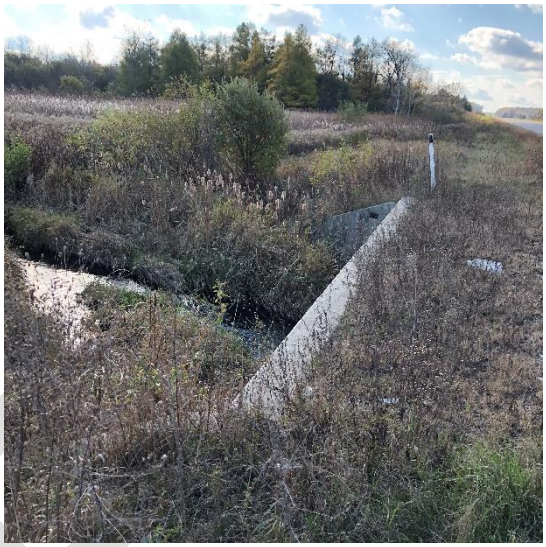

Photo 126

Looking Southbound along Route 164

Panel 34 in the Route Alternative Panels continues from the north end of Panel 33. As shown in this panel, Route 164 is a four-lane, divided two-way roadway. The land use around the route in Panel 34 is rural, with agricultural, commercial, and residential areas. The total length of the Common Corridor within Panel 34 is approximately 2,300 feet.

Panel 35 in the Route Alternative Panels continues from the north end of Panel 34. As shown in this panel, Route 164 is a four-lane, divided two-way roadway. The land use around the route in Panel 35 is rural, with agricultural, commercial, and residential areas. Approximately 3,160 feet south from the intersection of Route 164 and Route 59, a trenchless construction method of HDD is being considered to install approximately 360 linear feet of pipeline. This construction method is being considered to minimize impact to the creek. The total length of the Common Corridor within Panel 35 is approximately 2,300 feet. See Photos 127 and 128 for visual reference.

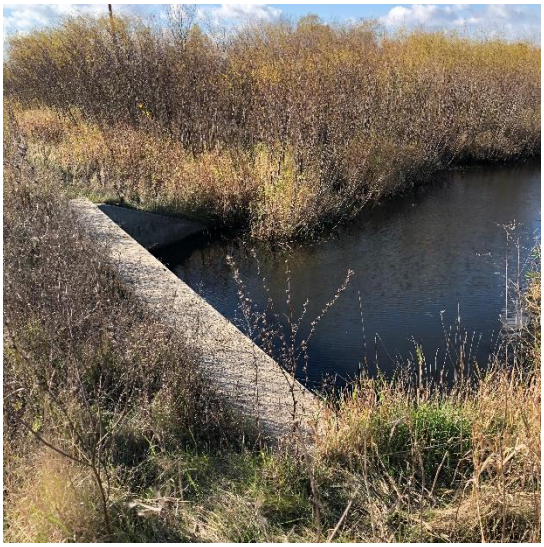

Photo 127

Looking Northbound along Route 164

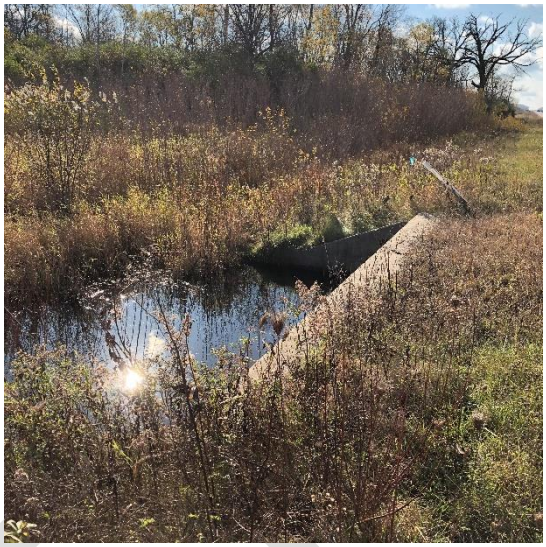

Photo 128

Looking Southbound along Route 164

Panel 36 in the Route Alternative Panels continues from the north end of Panel 35. As shown in this panel, Route 164 is a four-lane, divided two-way roadway. The land use around the route in Panel 36 is rural, with agricultural, commercial, and residential areas. The total length of the Common Corridor within Panel 36 is approximately 2,300 feet.

Panel 37 in the Route Alternative Panels continues from the north end of Panel 36 at the intersection of Route 164 and Route 59. As shown in this panel, both Route 164 (East Avenue) and Route 59 (Les Paul Parkway) are four-lane, divided two-way roadways. The land use around the route in Panel 37 is rural, with industrial and residential areas. This panel shows the convergence point of the separate Water Supply and Return Flow Pipeline alignments into the single Common Corridor alignment. At the intersection of Route 164 and Route 59, the Water Supply Pipeline diverges from the Common Corridor by turning to the east. At the southwest corner of the intersection of Route 164 and Route 59, a jack and bore method is being considered to install approximately 220 linear feet of pipe casing. This construction method is being considered to minimize traffic disruption crossing Route 59. At the northwest corner of the intersection of Route 164 and Route 59, a jack and bore method is being considered to install approximately 220 linear feet of pipe casing. This construction method is being considered to minimize traffic disruption crossing East Avenue. The total length of the Water Supply Pipeline within Panel 37 is approximately 3,700 feet. Refer to Panel 40 in Route Alternative 2 for visual reference.

Route 59 Segment

Panel 38 in the Route Alternative Panels, refer to Panel 40 in Route Alternative 2 for description. Note in Route Alternative 2 the pipeline is the Return Flow Pipeline and in Route Alternative 4 the pipeline is the Water Supply Pipeline.

Panel 39 in the Route Alternative Panels continues from the north end of Panel 38 at approximately 150 feet south of the intersection of Route 59 and Sunset Drive. As shown in this panel, Route 59 is a four-lane, divided two-way roadway. The land use around the route in this panel is urban, with residential areas. At the southwest corner of the intersection of Route 59 and Sunset Drive, a jack and bore method is being considered to install approximately 170

linear feet of pipe casing. This construction method is being considered to minimize traffic disruption along Sunset Drive. The total length of the Water Supply Pipeline within Panel 39 is approximately 2,600 feet. See Photos 90 and 91 for visual reference.

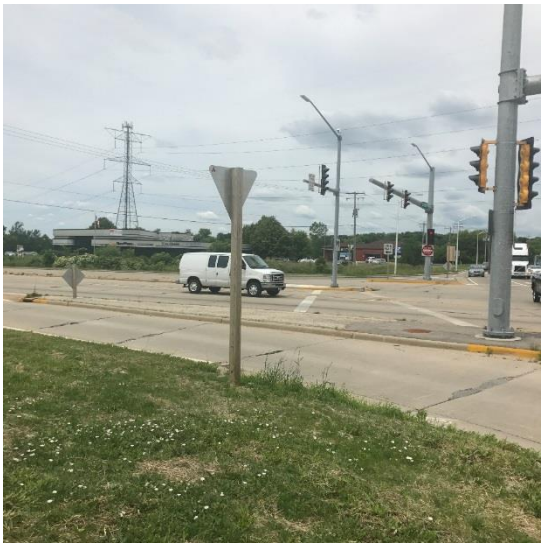

Photo 90

Looking Southbound along Route 59 at East Sunset Drive

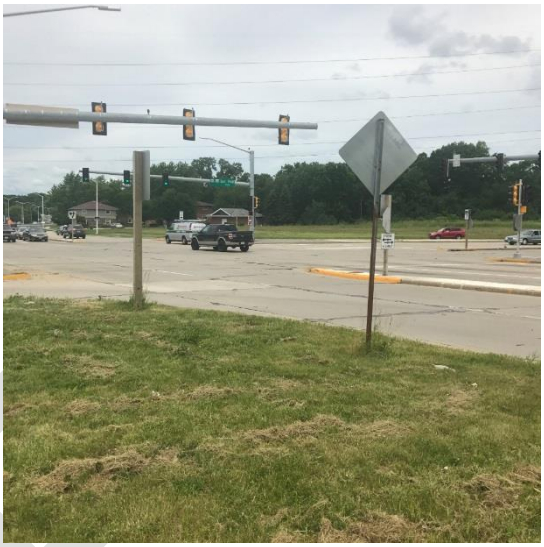

Photo 91

Looking Westbound along East Sunset Drive at Route 59

Panel 40 in the Route Alternative Panels continues from the north end of Panel 39 at approximately 2,200 feet to the northwest of the intersection of Route 59 and Sunset Drive. As shown in this panel, Route 59 is a four-lane, divided two-way roadway. The land use around the route in this panel is urban, with residential areas. The total length of the Water Supply Pipeline within Panel 40 is approximately 2,200 feet. See Photos 87 through 89 for visual reference.

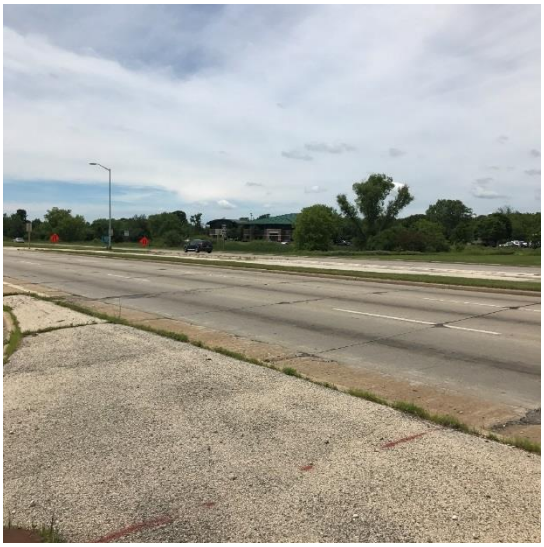

Photo 87

Looking Southbound along Route 59 at Racine Avenue

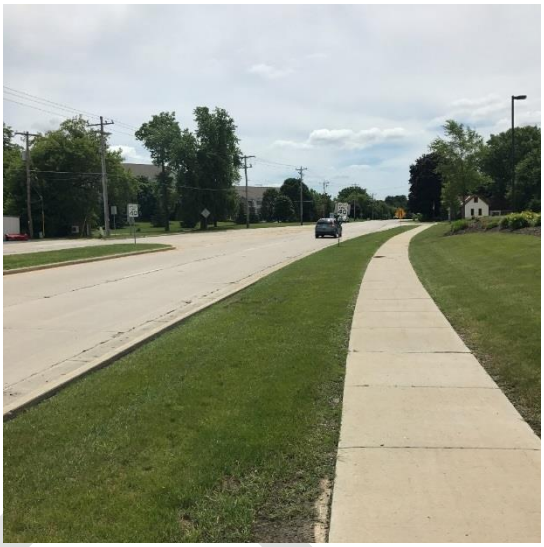

Photo 88

Looking Southbound along Racine Avenue at Route 59

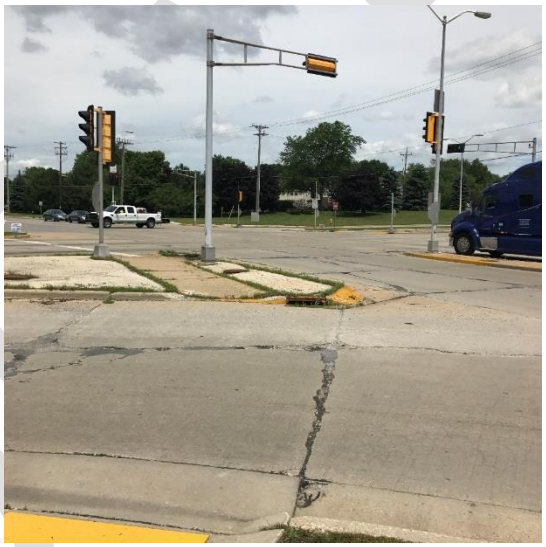

Photo 89

Looking Northbound along Racine Avenue at Route 59

Return Flow Pipeline Route Description (Route Alternative 4)

Sentry Drive Segment

Panel 41 in the Route Alternative Panels, refer to Panel 34 in Route Alternative 2 for description.

Panel 42 in the Route Alternative Panels, refer to Panel 35 in Route Alternative 2 for description.

Sunset Drive Segment

Panel 43 in the Route Alternative Panels, refer to Panel 36 in Route Alternative 2 for description.

Panel 44 in the Route Alternative Panels, refer to Panel 37 in Route Alternative 2 for description.

West Avenue Segment

Panel 45 in the Route Alternative Panels, refer to Panel 38 in Route Alternative 2 for description.

Route 59 Segment

Panel 46 in the Route Alternative Panels, refer to Panel 39 in Route Alternative 2 for description.

For the Common Corridor pipeline alignments between the convergence points on Panel 37 at the intersection of Route 59 and East Avenue, and on Panel 4 at the intersection Ryan Road and 60th Street, see the respective panel descriptions in the **Water Supply Pipeline Route Description** section.

60th Street Segment

Panel 4 in the Route Alternative Panels, refer to Panel 4 in Route Alternative 2 for description.

Panel 47 in the Route Alternative Panels, refer to Panel 43 in Route Alternative 2 for description.

Panel 48 in the Route Alternative Panels, refer to Panel 44 in Route Alternative 2 for description.

Alternate Supply Route Description

The narrative for the preliminary Water Supply Pipeline alignment of the Alternate Supply Route is presented below following the flow path from Milwaukee to Waukesha. The description provides the rationale for the preliminary horizontal alignment. The Alternate Supply Route is part of a separate assessment from Route Alternatives 2, 3, and 4. The Alternate Supply Route did not include descriptions and assessments for the Return Flow Pipeline.

60th Street Segment (in City of Milwaukee)

The Water Supply Pipeline for the Alternate Supply Route starts at the intersection of Howard Avenue and 60th Street. Going south on 60th Street, the route will pass through a predominately residential area with some commercial properties. Additional piping will be constructed to connect with the Water Supply Pumping Station in proximity to this location. Approximately 250 feet south of Plainfield Avenue, a trenchless installation means of HDD is being considered to install approximately 350 feet of pipeline. This construction method is being considered to avoid repairing the existing concrete box culverts drainage canal. The existing drainage canal runs northwest under 60th Street on a diagonal between Plainfield Avenue and Honey Creek Drive. The total length of the Water Supply Pipeline alternative along 60th Street is approximately 2,900 feet.

Cold Spring Road Segment

The Water Supply Pipeline will depart 60th Street and proceed west on Cold Spring Road. Cold Spring Road starts out as a two-lane, two-way road with parking lanes on either side. The road runs predominantly through residential areas with some commercial properties. West of the intersection of Cold Spring Road and 92nd Street, Cold Spring Road reduces to a two-lane, two-way road with no parking lanes. By aligning the Water Supply Pipeline down Cold Spring Road, crossing Interstate 41 is anticipated to be open cut construction in lieu of a trenchless method. It is anticipated that utility lines will need to be relocated near the underpass.

Continuing west of Interstate 41 on Cold Spring Road, the Water Supply Pipeline is being considered to be aligned just south of the two-lane, two-way road within the grass area until it passes 104th Street. Near 104th Street, a trenchless construction method of HDD is being considered to install approximately 850 linear feet of pipeline. This trenchless construction method is being considered to install the pipeline underneath the Root River that passes beneath Cold Spring Road.

As the Water Supply Pipeline approaches 108th Street, a minimum of 350 linear feet of HDD is be considered to cross the street and drainage canal made of concrete box culverts. The Water Supply Pipeline will continue along Cold Spring Road until 118th Street where a trenchless construction method of HDD is being considered to install a minimum of 350 linear feet of HDD. This construction method is being considered to pass under concrete box culverts.

Trenchless crossings along Cold Spring Road are being considered at the intersections of 68th Street, Forest Home Avenue, 76th Street, and 84th Street. Trenchless crossings are anticipated to be accomplished by the jack and bore method at major intersections to help mitigate disrupting traffic. HDD is being considered for crossing under creeks, rivers, and drainage canals. The total length of the Water Supply Pipeline along Cold Spring Road is approximately 20,100 feet.

Beloit Road Segment

The Water Supply Pipeline will depart Cold Spring Road and head southwest down Beloit Road. The route passes through predominantly residential areas as well as commercial and industrial properties. Continuing on Beloit Road about 300 feet east of the intersection of Beloit Road and Sunny Slope Road, a jack and bore method is being considered to avoid disrupting the intersection. It is anticipated that relocation of utilities will be required when excavating beneath the underpass to cross Interstate 43.

After passing under Interstate 43, the road transitions from a two-lane, two-way road to a two-lane, two-way road with turning lanes approaching the intersection with Moorland Road where multiple commercial properties are located.

At the intersection of Beloit Road and Moorland Road a trenchless crossing, using the jack and bore method, is being considered to avoid disrupting the intersection. Continuing down Beloit Road for approximately 500 linear feet, a trenchless crossing of HDD is being considered to install approximately 350 linear feet of pipeline. This construction method is being considered to pass under one of two entrances to the New Berlin Clinic and a creek, which crosses under Beloit Road through concrete box culverts

A trenchless construction method of HDD is being considered to install at least 350 linear feet of pipeline. This construction method is being considered to cross the creek. The creek crossing is located several hundred feet east of the location where the Water Supply Pipeline converges with the Return Flow Pipeline at the intersection of Beloit Road and Calhoun Road (reference Photo 133). The total length of the Water Supply Pipeline along Beloit Road is approximately 19,200 feet.

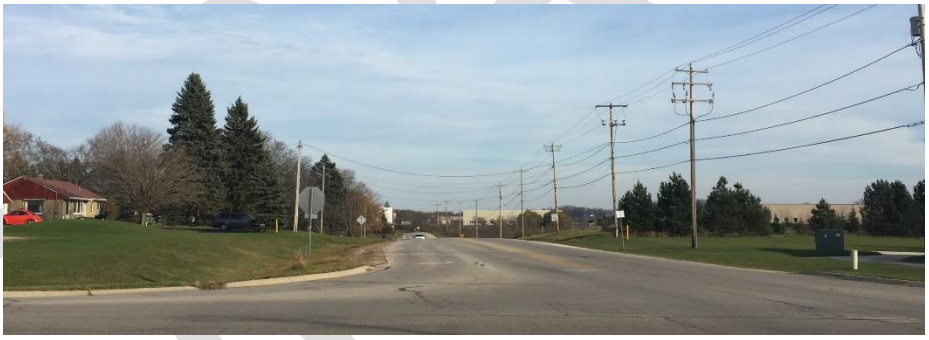

Photo 133 - Intersection of Beloit Road and Calhoun Road Looking East

Calhoun Road Segment (North of Beloit Road)

Departing Beloit Road, the Water Supply Pipeline will converge with the Return Flow Pipeline within a common trench in the Common Corridor. The Common Corridor containing both the Water Supply and Return Flow Pipelines will head north on Calhoun Road, which is a two-way, two-lane road predominantly surrounded by rural agricultural area and some residential properties. The total length of the Water Supply Pipeline along Calhoun Road is approximately 2,600 feet.

Parcels NBC 1236993 and NBC 1236995 Segment

From Calhoun Road, the Common Corridor will head west and then north across Parcel NBC 1236993 following the south and west property lines. The Common Corridor will cross parcel NBC 1236995 to avoid an existing structure on Parcel NBC 1236993 before crossing over National Avenue to the northwest side of the road. A 50-foot wide

permanent easement along with a 15-foot wide temporary construction easement has been recommended for installing the Water Supply and Return Flow Pipelines through these parcels. The center of the combined trench is anticipated to be aligned approximately 17 feet from the property line to allow space for construction access. A portion of the pipelines fall within a designated wetland along the south property line of parcel NBC 1236993. The total length of the Water Supply Pipeline along Parcels NBC 1236993 and NBC 1236995 is approximately 1,900 feet.

National Avenue Segment

Departing Parcel NBC 1236995, the Common Corridor pipelines in this alternative would turn west-southwest on National Avenue aligned within the northwest shoulder and drainage ditch. National Avenue is a two-way, two-lane road predominantly located within rural agricultural area. The total length of the Water Supply Pipeline along National Avenue is approximately 1,700 feet.

Lawnsdale Road Segment

The Common Corridor will depart National Avenue and proceed west along Lawnsdale Road, which is a two-way, two-lane road predominantly located within a rural agricultural area with some residential properties. There are overhead electrical lines approximately 25 feet from the edge of pavement providing sufficient space for installing the Water Supply and Return Flow Pipelines, while leaving a 10-foot buffer between the trench and overhead electrical lines. The total length of the Water Supply Pipeline along Lawnsdale Road is approximately 5,200 feet.

Racine Avenue Segment

From Lawnsdale Road, the Common Corridor pipelines will proceed north along Racine Avenue, which is a two-way, two-lane road that predominantly runs through rural agricultural area with some residential properties. Both pipelines will cross over Racine Avenue. The Water Supply and Return Flow Pipelines diverge at the southwest corner of Racine Avenue and Sunset Drive.

Continuing northwest on Racine Avenue passing Sunset Drive, the Water Supply Pipeline diverges from the Common Corridor. The Water Supply Pipeline will continue until the intersection of Racine Avenue and Route 59, where the Water Supply Pipeline is anticipated to be connected to Waukesha's existing distribution system. The total length of the Water Supply Pipeline along Racine Avenue is approximately 19,200 feet.

Alternate Supply Route Sub-Alternative Description

The narrative for the preliminary Water Supply Pipeline alignment of the Alternate Supply Route Sub-Alternative is presented below following the flow path from Milwaukee to Waukesha. The description provides the rationale for the preliminary horizontal alignment. The Alternate Supply Route Sub-Alternative is part of a separate assessment from Route Alternatives 2, 3, and 4. The Alternate Supply Route Sub-Alternative did not include descriptions and assessments for the Return Flow Pipeline.

This Water Supply Pipeline route alternative starts at the intersection of Howard Avenue and 60th Street. Going south on 60th Street, the route passes through predominately residential areas. Additional piping will be constructed to connect with the Water Supply Pumping Station in proximity to this location.

Approximately 150 feet north of West Plainfield Avenue, the Water Supply Pipeline will turn ninety degrees to the west within an electrical transmission utility corridor (reference **Photo 134**). The total length of the Water Supply Pipeline along 60th Street is approximately 1,700 feet.

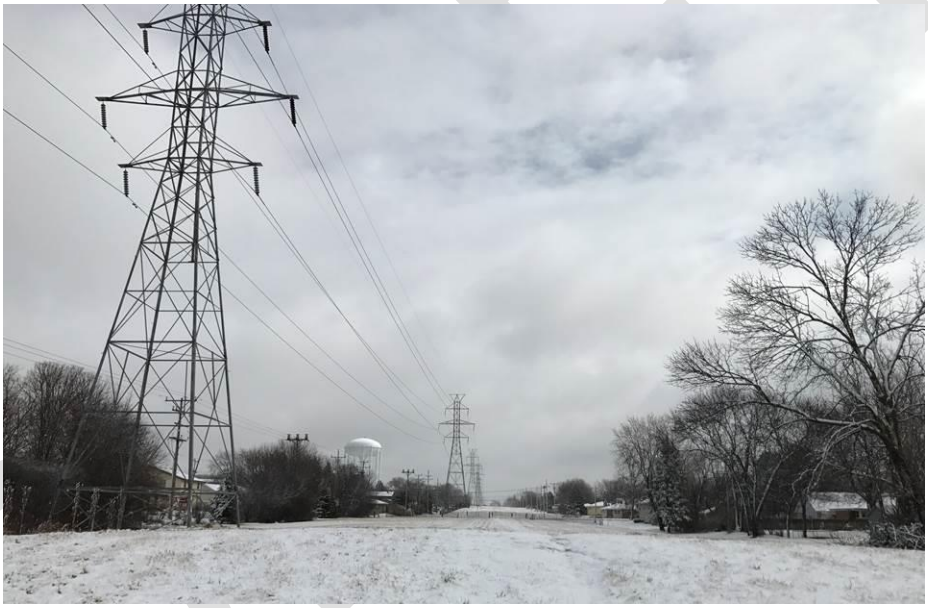

Photo 134 – Electrical Transmission Utility Corridor at 92nd Street Looking East

Within the electrical transmission utility corridor, the Water Supply Pipeline alignment will be dependent on the existing and future electrical transmission facilities within the electrical transmission corridor. An option is to align the pipeline along the boundary of the corridor where sufficient space is provided for dissipation of the magnetic field from the power lines. This arrangement can minimize impact to the corridor use from the pipeline.

There are several anticipated trenchless crossings within the electrical transmission utility corridor via the jack and bore method when crossing busy intersections, and HDD when crossing a concrete lined drainage canal. Approximate 300 feet west from where the Water Supply Pipeline turns ninety degrees off 60th Street, 350 linear feet of HDD is being considered to install the pipeline under the existing drainage canal. At 68th Street, West Forest Home Avenue, and 76th Street the jack and bore method is being considered to be used to avoid disrupting traffic. The total length of the Water Supply Pipeline along the electrical transmission utility corridor is approximately 11,200 feet.

The Water Supply Pipeline exits the electrical transmission utility corridor at 92nd Street where the Water Supply Pipeline will then turn south. 92nd Street is a two-lane, two-way road, which runs predominantly through a residential area. 92nd Street is anticipated to be temporarily closed from the electrical transmission utility corridor to Cold Spring Road. The total length of the Water Supply Pipeline along the 92nd Street is approximately 1,100 feet.

At Cold Spring Road, the Water Supply Pipeline will turn ninety-degrees and proceed west. From the intersection of 92nd Street and Cold Spring Road, the Water Supply Pipeline, Common Corridor, and Return Flow Pipeline will be the same as for the Alternate Supply Route, as is discussed for the Alternate Supply Route downstream of Cold Spring Road. The total length of the Water Supply Pipeline along Cold Spring Road is approximately 8,800 feet.

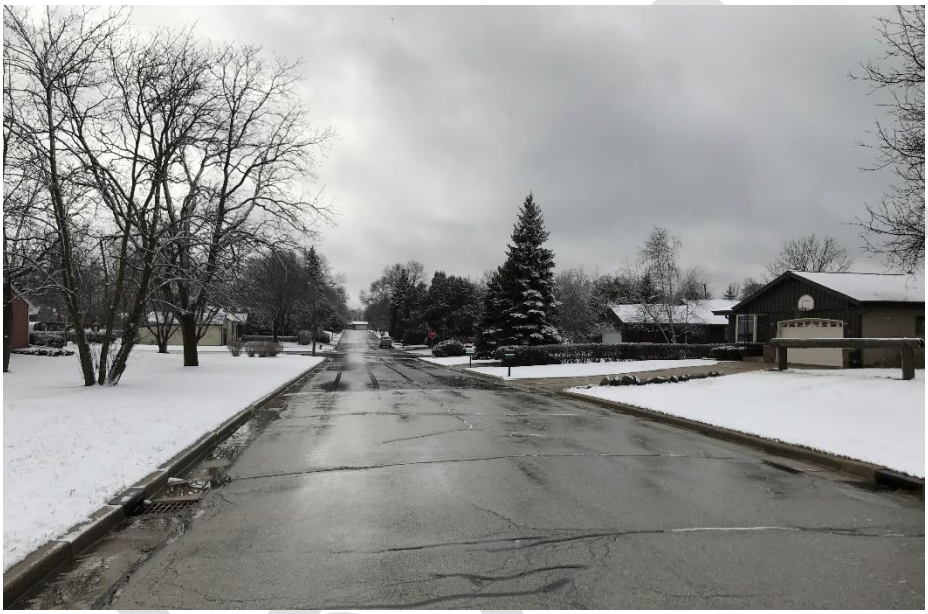

Photo 135 – 92nd Street at the Electrical Transmission Utility Corridor Looking South