US 41/441 Operational Analysis — US 41 and CTH S (Freedom Rd)

Mainline Route	Crossroad
US 41	CTH S
Region	**Location**
Northeast	Town of Lawrence
Interchange Type	**Crossroad Function**
Diamond	Minor Arterial
Ramp Terminal	**Bridge Sufficiency**
Stop Controlled	B-05-0162 = 99.0
Bridge Hits	**Bridge Service Life**
	B-05-0162 built 1993

No-Build Conditions Operations

		NB Diverge	NB Merge	SB Diverge	SB Merge	NB Ramp	SB Ramp	FWY South (NB)	FWY North (NB)	FWY North (SB)	FWY South (SB)	Total	Notes
LOS	2035	C (C)	D (C)	C (D)	C (D)	F (F)	F (F)	C (E)	E (D)	C (D)	D (D)		AM Peak (PM Peak)
	2020	C (C)	C (C)	C (C)	C (C)	D (C)	D (D)	C (C)	D (C)	C (C)	D (C)		
	Existing	C (B)	C (B)	B (C)	B (B)	B (B)	B (B)	C (B)	B (C)	C (B)	B (B)		
Queue	2035					218 (294)	209 (442)						Max Length of Queue AM (PM) Distance from Terminal to Gore: NB = 1150' SB = 1200'
	2020					129 (196)	138 (180)						
	Existing					68 (63)	111 (116)						
Crashes	2002-2009	21	20	23	25	1	2	25	38	30	23	208	
	Severity	.52	.35	.43	.48	.18	.35	.36	.42	.43	.43		(INJ+FAT) / Total Crash
	Rate	37	35	37	45	0	.50	41	66	52	37		Merge & Diverge = HMVMT Intersection = MEV

Improved Alternative Summary

Title	Description
Alternative 1	Ramp terminals: lengthen off ramp right turn storage based on 2020 analysis
Alternative 2	Ramp terminals: Signalize based on 2035 analysis
Alternative 3	2020 and 2035 RAB. Unrelated to signal design.

Improved Conditions Operations

		NB Diverge	NB Merge	SB Diverge	SB Merge	NB Ramp	SB Ramp	FWY East (NB)	FWY East (SB)	FWY West (NB)	FWY West (SB)	Total	Notes
LOS	Alt. 1	C (C)	C (C)	C (C)	C (C)	D (C)	D (D)	C (C)	D (C)	C (C)	D (C)		AM Peak (PM Peak)
	Alt. 2	C (C)	D (C)	C (D)	C (D)	D (C)	D (C)	C (E)	E (D)	C (D)	D (D)		
	Alt. 3	C (C)	C (C)	C (C)	C (C)	A (A)	A (A)	C (C)	D (C)	C (C)	D (C)		
Queue	Alt. 1					118 (258)	101 (175)						Max Length of Queue AM (PM) Distance from Terminal to Gore: NB = 1150' SB = 1200'
	Alt. 2					272 (313)	236 (296)						
	Alt. 3					25 (25)	25 (25)						

Improved Conditions Operations

		NB Diverge	NB Merge	SB Diverge	SB Merge	NB Ramp	SB Ramp	FWY East (NB)	FWY East (SB)	FWY West (NB)	FWY West (SB)	Total	Notes
Crash Benefit	Alt. 1											0	Crash Benefits calculated by: Reduction in PD Crashes *7,000 + Reduction in INJ Crashes *35,000 + Reduction in FAT Crashes *70,000 (Benefits expressed in thousands over an eight year period)
	Alt. 2						1					1	
	Alt. 3						3					3	

Alternative Construction Costs

	Total Cost	Structure Costs	ROW Costs
Alternative 1	$100,000	$0	$0
Alternative 2	$665,000	$0	$0
Alternative 3	$5,183,000	$961,000	$266,000

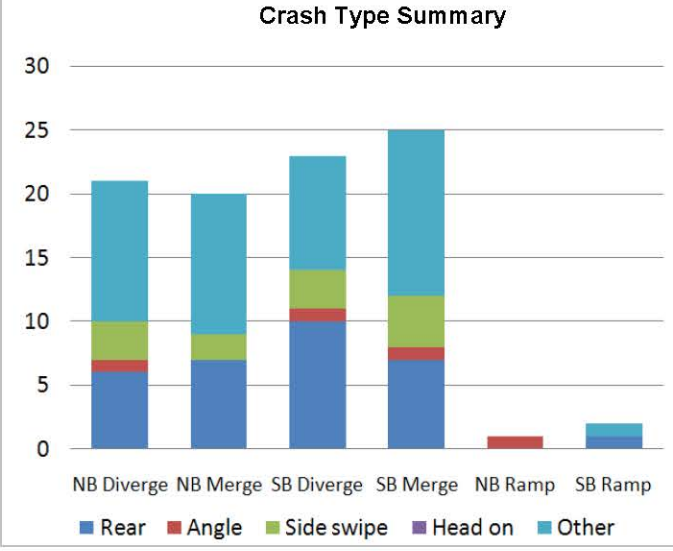
Preliminary Environmental Screening

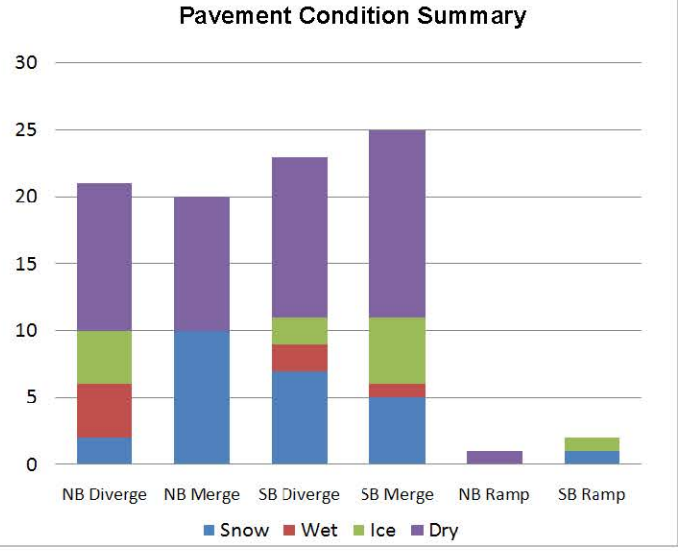
- DNR designated wetlands are located on the west and northeast sides of the interchange along Ashwaubenon Creek.
- An unknown prehistoric campsite/village has been identified southwest of the interchange along US 41.

Existing Geometric Deficiencies Rating

Freeway/Ramps	Score	Comments
Ramp Design Speed & Horizontal Alignment	Acceptable	
Ramps Merge / Diverge	Poor	NB and SB ramps have high crash severity
Ramp Stopping Sight Distance	Acceptable	
Bridges		
Bridge Width	Acceptable	
Crossroad		
Intersection Skew / Intersection Sight Distance	Acceptable	
Geometric Deficiency Score	Roadway Geometric Score = 8 / 10	Bridge Geometric Score = 4 / 5

Detailed Crash Analysis





US 41 & CTH S (FREEDOM ROAD) INTERCHANGE

Alternatives Considered

The goal of the short term alternatives for the US 41 & CTH S (Freedom Road) interchange is to address the needs and deficiencies identified in the US 41-WIS 441 Operation Needs Assessment Summary report dated March 2011. The following is a summary of the needs and deficiencies at the CTH S Interchange:

- Bridge vertical clearance that is less than desired.
- Access control between ramps and adjacent intersections being less than desired.
- High crash rates or severity at the southbound off ramp, southbound ramp terminal, and the northbound on ramp.

Although the bridge is vertically deficient, it is only by 0.05' therefore does not warrant an improvement. The high crash rate is due to three injury crashes out of five over the course of eight years rather than a large number of crashes. The high severity rate is the same issue where almost half of the crashes were injuries, but there was an average of about 3 crashes a year at both ramp locations.

The primary need at the CTH S (Freedom Road) interchange is to improve the safety and operations at the ramp terminal intersections.

The following alternatives have been developed based on an order of importance with regard to safety and operations, and should be considered cumulative with each other. The alternative analyses (LOS, queue lengths, etc) reflect this method. For example, Alternative 2 should only be considered in addition to Alternative 1.

Alternative 1

This alternative addresses the operational and safety problems at the interchange by making the following changes:

- Extend off ramp right turn storage by 75 feet (Southbound off ramp) and 150 feet (Northbound off ramp)
- Provide a continuous westbound right turn lane approaching Mid Valley Drive

Alternative 1 lengthens right turn storage on both off ramps. During 2020, off ramp left turning traffic is expected to experience an increase in delay due to an increase in conflicting traffic. Both off ramp approaches are expected to operate at LOS D. During 2035, LOS is expected to operate at LOS F.

Alternative 2

This alternative addresses the operational and safety problems at the interchange by making the following changes:

- All changes made in Alternative 1.
- Signalize northbound and southbound ramp terminals
- Provide left turn storage at Mid Valley Drive on the eastbound, westbound and southbound approaches.

The signalization improvement in Alternative 2 develops vehicle platoons and gaps in traffic. With these gaps, adjacent intersection cross streets (French and Mid Valley) have the opportunity to conduct turning movements. The HCM method (calculation) of determining levels of service (LOS) does not consider gaps that are created by signalization. Therefore, LOS F on the northbound approach of French Road is conservative and better operations are expected.

During 2035, ramp terminal traffic warrants the use of traffic signals. Under signal control, the ramp terminals during both peak hours are expected to operate at overall LOS B or better. All way stop control is proposed at French Road. All way stop provides north/south traffic with the opportunity to traverse the intersection. Eastbound traffic may have a tendency to queue to the northbound off ramp during the PM peak hour.

At the time of this report, these are the best alternatives. However, if US 41 mainline is deemed to be expanded to a six lane highway, the bridge may need to be constructed. If the bridge needs to be reconstructed, the interchange may function better as a SPUI.

Alternative 2 Local

An alternative for local improvements has been detailed below. This alternative addresses operational problems at Mid Valley Dr by making the following change:

- Provide left turn storage at Mid Valley Drive on the eastbound, westbound and southbound approaches

This alternative will improve operations at the adjacent intersections only.

Alternative 3

The Year 2020 and 2035 roundabout alternative maintains a two-lane facility and provides one-lane roundabouts along the corridor. All movements are expected to operate at LOS A and experience acceptable queues and delays. Substantial surplus capacity[1] is expected beyond the forecasted Year 2035 traffic conditions. A system of roundabouts at this location will allow for the use of right-in/right-outs at future driveway locations as U-Turns are accommodated within the roundabouts.

Comparison of Alternatives

The interchange alternatives were compared based on safety, traffic operations, cost and other factors:

Safety

The crash severity has been high in the past due to a number of injury crashes, but there is not a large sum of crashes. Therefore, there has not been a safety issue at this interchange nor there will be one in the future.

[1] Determined by applying an equal percentage increase to all volumes at an intersection under the 50th CL until a leg failed; the lowest percent increase among the intersections was reported. Therefore, the remaining intersections at each interchange will have higher surplus capacity values.

Traffic Operations

Both alternatives reduce congestion for the respective projected traffic. In 2035, the ramps fail without any adjustments, but they are LOS D or better with minor adjustments.

All operations are under the assumption that the traffic signal phasing utilizes single ring TTI (Texas Transportation Institute) phasing. Different signal phasing would require additional analysis to determine altered LOS and queue distances.

Environmental Factors

DNR designated wetlands are located on the west and northeast sides of the interchange along Ashwaubenon Creek. An unknown prehistoric campsite/village has been identified southwest of the interchange along US 41.

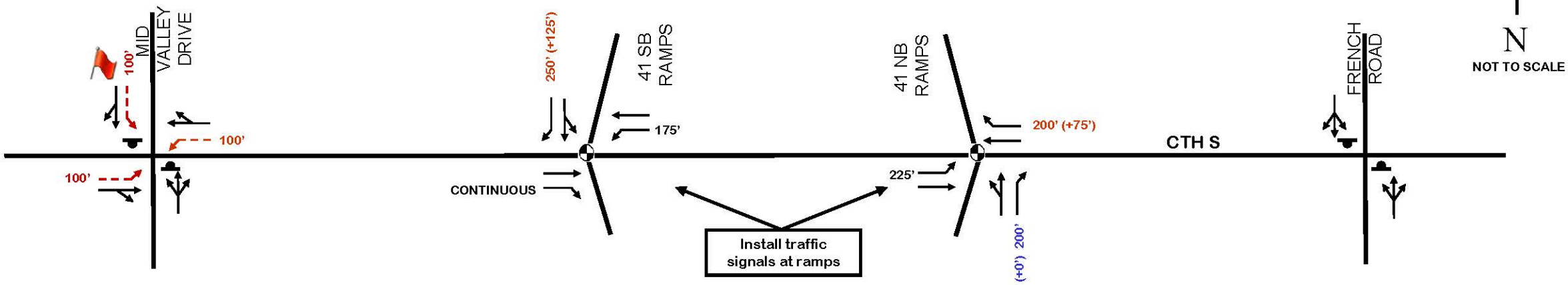
Complete Streets

The CTH S Interchange is located just outside the Green Bay Metropolitan Planning Area. Future growth in the Green Bay area may require communication with the Green Bay Metropolitan Planning Organization (MPO) to determine proper bike/pedestrian accommodations. The overpass itself contains a very wide outside lane to accommodate bike and pedestrian traffic. Initial additions should include wider shoulders on CTH S to accommodate an anticipated increase in bicycle traffic. WisDOT also has a Park and Ride in the Southwest quadrant that may be getting extended and resurfaced as part of WisDOT project 1130-44-00.

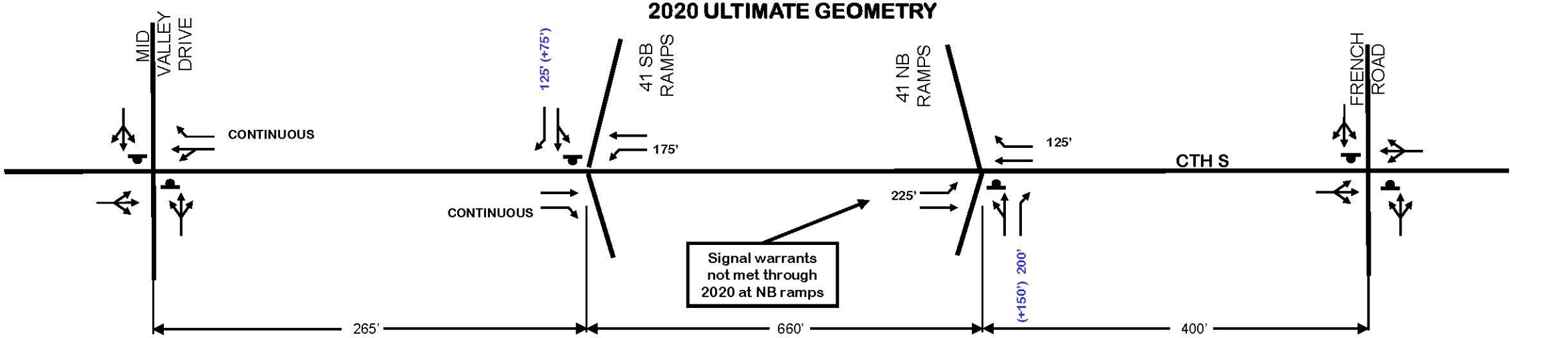
US 41 / CTH S

PREPARED 3-31-11

2035 ULTIMATE GEOMETRY



2020 ULTIMATE GEOMETRY



XX' BASE GEOMETRICS PLANNED TURN BAY LENGTH	BASE GEOMETRICS	TRAFFIC SIGNAL
(+XX') ADDITIONAL TURN BAY LENGTH RECOMMENDED	ADDITIONAL IMPROVEMENT RECOMMENDED	STOP SIGN
(+XX') ADDITIONAL TURN BAY LENGTH REQUIRED FOR 2035 VOLUMES	ADDITIONAL IMPROVEMENT REQUIRED FOR 2035 VOLUMES	OPERATIONAL PROBLEMS REMAIN

USH 41/WIS 441 Short-Term Improvement Cost Estimate
CTH S

	Roadway	Structure	Construction	R/W Cost	CM & Eng	Incremental Total	Total
Alternative 1	$ 60,000	$ -	$ 36,000	$ -	$ 4,000	$ 100,000	$ 100,000
Alternative 2	$ 338,000	$ -	$ 206,000	$ -	$ 21,000	$ 565,000	$ 665,000
Alternative 2 local*	$ 108,000	$ -	$ 66,000	$ -	$ 7,000		$ 181,000
Alternative 3	$ 2,362,000	$ 961,000	$ 1,449,000	$ 266,000	$ 145,000	$ 5,183,000	$ 5,183,000
Alternative 3 local*	$ 1,200,000	$ -	$ 725,000	$ 170,000	$ 73,000		$ 2,168,000

*Local cost estimates take into account only costs that would affect local traffic

Item	Item Description	Unit	Unit Price	
1	New Concrete Pavement[1]	SY	$65	Concrete, Base Aggregate, Crushed
2	New HMA Pavement[2]	SY	$50	HMA, Base Aggregate, Crushed
3	Sidewalk	SY	$35	
4	Curb and Gutter	LF	$20	
5	Earthwork	CY	$20	Cut or fill, based on observed topography, including ditches
6	Signal Pole Relocation	EA	$15,000	
7	Signal System	EA	$165,000	
8	Ramp Meter	EA	$75,000	
9	Ramp Meter- remove and reinstall	EA	$35,000	
10	Sign Bridge	EA	$100,000	
11	Drainage - Inlets/Manholes	EA	$700	
12	Drainage - Pipes/Culverts	LF	$50	
13	Drainage - Pipes/Culverts - extensions	LF	$100	
14	Concrete Barrier - 42"	LF	$70	
15	Retaining wall - non-structural (<5')	SF	$25	
16	Beam Guard	LF	$20	
17	Beam Guard End Absorbing Terminal	EA	$2,500	
18	Unique Items		$0	Add Items unique to these locations,
19				that are too large to be covered in 'Road Incidentals'.
20				
	Subtotal			
	Road Incidentals[3]	LS	20%	removals, finishing, erosion, removals, lighting, etc
	Planning Level Contingency[2]	LS	20%	
	Signing & Pavement Marking[3]	LS	5%	
	Traffic Control - urban mainline[3,4]	LS	12%	assumed 100% unless other TC is entered
	Traffic Control - rural mainline[3,4]	LS	10%	enter percent of project on rural mainline
	Traffic Control - ramps[3,4]	LS	8%	enter percent of project on ramps
	Traffic Control - local roads[3,4]	LS	5%	enter percent on local roads
	Bridges - new and widening with substructure	SF	$ 140.00	Area of Bridge Deck
	Bridges - widening using existing substructure	SF	$ 100.00	Area of Bridge Deck
	Bridges - redecking	SF	$ 70.00	Area of Bridge Deck
	Retaining walls - structural	SF	$ 35.00	area of exposed wall face
	Mobilization[5]	LS	6%	
	CM & Engineering[6]	LS	10%	
	Right of Way			Site Specific
	Commercial Real Estate	SF	$ 17.00	
	Residential Real Estate	SF	$ 9.00	
	Commercial Relocation Cost	SF		
	Residential Relocation Cost	SF		
	Lighting	LS		

NOTES:

1. New Concrete Pavement consists of: Concrete Pavement 10", $50/SY; Base Aggregate, 6", $16/ton; Select Crushed, 12", $14/ton.
2. New HMA Pavement consists of: HMA, 5", $70/ton; Oil, $600/ton; Base Aggregate, 12", $16/ton; Select Crushed, 12", $14/ton
3. Lump Sum items are computed as a percentage of the roadway item costs. These do not include structural component costs.
4. Traffic Control is a lump sum, between 5% - 12%, weighted by the estimated construction cost on each roadway type.
5. Mobilization is computed as a percentage of the all item costs, including structural components.
6. Construction Management and Engineering are computed as a percentage of the total construction cost.

Preliminary Cost Estimate: USH 41 at CTH S
Alternative 1

Item	Item Description	Unit	Unit Price	Quantity	Total	Comments
1	New Concrete Pavement[1]	SY	$65	800	$52,000	
2	New HMA Pavement[2]	SY	$50		$0	
3	Sidewalk	SY	$35		$0	
4	Curb and Gutter	LF	$20		$0	
5	Earthwork	CY	$20	200	$4,000	
6	Signal Pole Relocation	EA	$15,000		$0	
7	Signal System	EA	$165,000		$0	
8	Ramp Meter	EA	$75,000		$0	
9	Ramp Meter- remove and reinstall	EA	$35,000		$0	
10	Sign Bridge	EA	$100,000		$0	
11	Drainage - Inlets/Manholes	EA	$700		$0	
12	Drainage - Pipes/Culverts	LF	$50		$0	
13	Drainage - Pipes/Culverts - extensions	LF	$100		$0	
14	Concrete Barrier - 42"	LF	$70		$0	
15	Retaining wall - non-structural (<5')	SF	$25		$0	
16	Beam Guard	LF	$20	75	$1,500	
17	Beam Guard End Absorbing Terminal	EA	$2,500	1	$2,500	
18	Lighting	LS				
19	Unique Items					
20						
	Roadway Total			**$60,000**		
	Road Incidentals	LS	20%		$12,000	
	Planning Level Contingency	LS	20%		$12,000	
	Signing & Pavement Marking	LS	5%		$3,000	
	Traffic Control - urban mainline	LS	12%	100%	$7,000	
	Traffic Control - rural mainline	LS	10%	0%	$0	
	Traffic Control - ramps	LS	8%	0%	$0	
	Traffic Control - local roads	LS	5%	0%	$0	
	Bridges - new and widening with substructure	SF	$ 140.00		$0	
	Bridges - widening using existing substructure	SF	$ 100.00		$0	
	Bridges - redecking	SF	$ 70.00		$0	
	Retaining walls - structural	SF	$ 35.00		$0	
	Structure Total			**$0**		
	Mobilization	LS	6%		$2,040	
	Construction Total			**$36,000**		
	Const. Mngmt & Engineering Total	LS	10%	**$4,000**		
	Commercial Real Estate	SF	0%		$0	
	Residential Real Estate	SF	0%		$0	
	Commercial Relocation Cost	LS	0%		$0	
	Residential Relocation Cost	LS	0%		$0	
	R/W Total			**$0**		
	TOTAL COST			**$100,000**		

Preliminary Cost Estimate: USH 41 at CTH S
Alternative 2

Item	Item Description	Unit	Unit Price	Quantity	Total	Comments
1	New Concrete Pavement[1]	SY	$65	2,225	$144,625	
2	New HMA Pavement[2]	SY	$50		$0	
3	Sidewalk	SY	$35		$0	
4	Curb and Gutter	LF	$20		$0	
5	Earthwork	CY	$20	500	$10,000	
6	Signal Pole Relocation	EA	$15,000		$0	
7	Signal System	EA	$165,000	1	$165,000	
8	Ramp Meter	EA	$75,000		$0	
9	Ramp Meter- remove and reinstall	EA	$35,000		$0	
10	Sign Bridge	EA	$100,000		$0	
11	Drainage - Inlets/Manholes	EA	$700		$0	
12	Drainage - Pipes/Culverts	LF	$50		$0	
13	Drainage - Pipes/Culverts - extensions	LF	$100		$0	
14	Concrete Barrier - 42"	LF	$70		$0	
15	Retaining wall - non-structural (<5')	SF	$25		$0	
16	Beam Guard	LF	$20	663	$13,260	
17	Beam Guard End Absorbing Terminal	EA	$2,500	2	$5,000	
18	Lighting	LS				
19	Unique Items					
20						
	Roadway Total			**$338,000**		
	Road Incidentals	LS	20%		$68,000	
	Planning Level Contingency	LS	20%		$68,000	
	Signing & Pavement Marking	LS	5%		$17,000	
	Traffic Control - urban mainline	LS	12%	100%	$41,000	
	Traffic Control - rural mainline	LS	10%	0%	$0	
	Traffic Control - ramps	LS	8%	0%	$0	
	Traffic Control - local roads	LS	5%	0%	$0	
	Bridges - new and widening with substructure	SF	$ 140.00		$0	
	Bridges - widening using existing substructure	SF	$ 100.00		$0	
	Bridges - redecking	SF	$ 70.00		$0	
	Retaining walls - structural	SF	$ 35.00		$0	
	Structure Total			**$0**		
	Mobilization	LS	6%		$11,640	
	Construction Total			**$206,000**		
	Const. Mngmt & Engineering Total	LS	10%	**$21,000**		
	Commercial Real Estate	SF	0%		$0	
	Residential Real Estate	SF	0%		$0	
	Commercial Relocation Cost	LS	0%		$0	
	Residential Relocation Cost	LS	0%		$0	
	R/W Total			**$0**		
	TOTAL COST			**$565,000**		

Preliminary Cost Estimate: USH 41 at CTH S
Alternative 2 local*
*Local cost estimates take into account only costs that would affect local traffic

Item	Item Description	Unit	Unit Price	Quantity	Total	Comments
1	New Concrete Pavement[1]	SY	$65	1,225	$79,625	
2	New HMA Pavement[2]	SY	$50		$0	
3	Sidewalk	SY	$35		$0	
4	Curb and Gutter	LF	$20		$0	
5	Earthwork	CY	$20	500	$10,000	
6	Signal Pole Relocation	EA	$15,000		$0	
7	Signal System	EA	$165,000		$0	
8	Ramp Meter	EA	$75,000		$0	
9	Ramp Meter- remove and reinstall	EA	$35,000		$0	
10	Sign Bridge	EA	$100,000		$0	
11	Drainage - Inlets/Manholes	EA	$700		$0	
12	Drainage - Pipes/Culverts	LF	$50		$0	
13	Drainage - Pipes/Culverts - extensions	LF	$100		$0	
14	Concrete Barrier - 42"	LF	$70		$0	
15	Retaining wall - non-structural (<5')	SF	$25		$0	
16	Beam Guard	LF	$20	663	$13,260	
17	Beam Guard End Absorbing Terminal	EA	$2,500	2	$5,000	
18	Lighting	LS				
19	Unique Items					
20						
	Roadway Total			**$108,000**		
	Road Incidentals	LS	20%		$22,000	
	Planning Level Contingency	LS	20%		$22,000	
	Signing & Pavement Marking	LS	5%		$5,000	
	Traffic Control - urban mainline	LS	12%	100%	$13,000	
	Traffic Control - rural mainline	LS	10%	0%	$0	
	Traffic Control - ramps	LS	8%	0%	$0	
	Traffic Control - local roads	LS	5%	0%	$0	
	Bridges - new and widening with substructure	SF	$ 140.00		$0	
	Bridges - widening using existing substructure	SF	$ 100.00		$0	
	Bridges - redecking	SF	$ 70.00		$0	
	Retaining walls - structural	SF	$ 35.00		$0	
	Structure Total			**$0**		
	Mobilization	LS	6%		$3,720	
	Construction Total			**$66,000**		
	Const. Mngmt & Engineering Total	LS	10%	**$7,000**		
	Commercial Real Estate	SF	0%		$0	
	Residential Real Estate	SF	0%		$0	
	Commercial Relocation Cost	LS	0%		$0	
	Residential Relocation Cost	LS	0%		$0	
	R/W Total			**$0**		
	TOTAL COST			**$181,000**		

Preliminary Cost Estimate: USH 41 at Alternative 3

USH 41 & CTH S (2020)

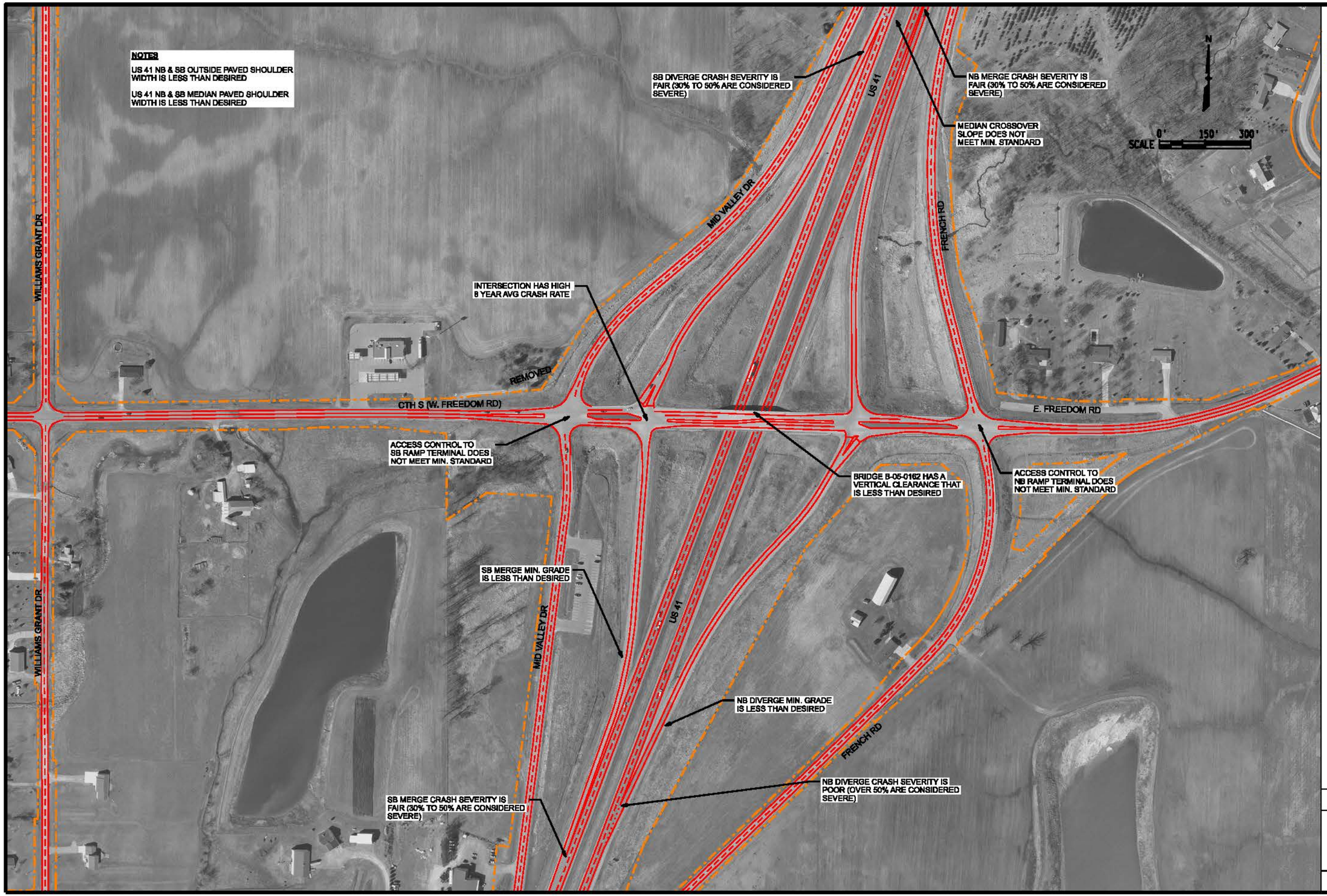
Item	Item Description	Unit	Unit Price	Quantity	Total	Comments
1	New Concrete Pavement[1]	SY	$65	22,900	$1,488,500	
2	New HMA Pavement[2]	SY	$50	0	$0	
3	Sidewalk	SY	$35	2,500	$87,500	
4	Curb and Gutter	LF	$20	12,350	$247,000	
5	Earthwork	CY	$20	19,250	$385,000	
6	Signal Pole Relocation	EA	$15,000	0	$0	
7	Signal System	EA	$165,000	0	$0	
8	Ramp Meter	EA	$75,000	0	$0	
9	Ramp Meter- remove and reinstall	EA	$35,000	0	$0	
10	Sign Bridge	EA	$100,000	0	$0	
11	Drainage - Inlets/Manholes	EA	$700	40	$28,000	
12	Drainage - Pipes/Culverts	LF	$50	2,518	$125,900	
13	Drainage - Pipes/Culverts - extensions	LF	$100	0	$0	
14	Concrete Barrier - 42"	LF	$70	0	$0	
15	Retaining wall - non-structural (<5')	SF	$25	0	$0	
16	Lighting	LS		0		
17	Unique Items					
18						
19						
20						
	Roadway Total			**$2,362,000**		
	Road Incidentals	LS	20%		$472,000	
	Planning Level Contingency	LS	20%		$472,000	
	Signing & Pavement Marking	LS	5%		$118,000	
	Traffic Control - urban mainline	LS	12%	55%	$156,000	
	Traffic Control - rural mainline	LS	10%	0%	$0	
	Traffic Control - ramps	LS	8%	30%	$57,000	
	Traffic Control - local roads	LS	5%	15%	$18,000	
	Bridges - new and widening with substructure	SF	$ 140.00		$0	
	Bridges - widening using existing substructure	SF	$ 100.00		$0	
	Bridges - redecking	SF	$ 70.00	13,725	$960,750	
	Retaining walls - structural	SF	$ 35.00		$0	
	Structure Total			**$961,000**		
	Mobilization	LS	6%		$135,225	
	Construction Total			**$1,449,000**		
	Const. Mngmt & Engineering Total	LS	10%	**$145,000**		
	Commercial Real Estate	SF	$17.00		$0	
	Residential Real Estate	SF	$9.00		$0	
	Commercial Relocation Cost	LS	0		$0	
	Residential Relocation Cost	LS	0		$0	
	R/W Total			**$266,000**		
	TOTAL COST			**$5,183,000**		

Preliminary Cost Estimate: USH 41 at Alternative 3 local*

USH 41 & CTH S (2020)

*Local cost estimates take into account only costs that would affect local traffic

Item	Item Description	Unit	Unit Price	Quantity	Total	Comments
1	New Concrete Pavement[1]	SY	$65	12,230	$794,950	
2	New HMA Pavement[2]	SY	$50		$0	
3	Sidewalk	SY	$35	960	$33,600	
4	Curb and Gutter	LF	$20	5,200	$104,000	
5	Earthwork	CY	$20	9,850	$197,000	
6	Signal Pole Relocation	EA	$15,000		$0	
7	Signal System	EA	$165,000		$0	
8	Ramp Meter	EA	$75,000		$0	
9	Ramp Meter- remove and reinstall	EA	$35,000		$0	
10	Sign Bridge	EA	$100,000		$0	
11	Drainage - Inlets/Manholes	EA	$700	20	$14,000	
12	Drainage - Pipes/Culverts	LF	$50	1,122	$56,100	
13	Drainage - Pipes/Culverts - extensions	LF	$100		$0	
14	Concrete Barrier - 42"	LF	$70		$0	
15	Retaining wall - non-structural (<5')	SF	$25		$0	
16	Lighting	LS				
17	Unique Items					
18						
19						
20						
	Roadway Total			**$1,200,000**		
	Road Incidentals	LS	20%		$240,000	
	Planning Level Contingency	LS	20%		$240,000	
	Signing & Pavement Marking	LS	5%		$60,000	
	Traffic Control - urban mainline	LS	12%	100%	$144,000	
	Traffic Control - rural mainline	LS	10%	0%	$0	
	Traffic Control - ramps	LS	8%	0%	$0	
	Traffic Control - local roads	LS	5%	0%	$0	
	Bridges - new and widening with substructure	SF	$ 140.00		$0	
	Bridges - widening using existing substructure	SF	$ 100.00		$0	
	Bridges - redecking	SF	$ 70.00		$0	
	Retaining walls - structural	SF	$ 35.00		$0	
	Structure Total			**$0**		
	Mobilization	LS	6%		$41,040	
	Construction Total			**$725,000**		
	Const. Mngmt & Engineering Total	LS	10%	**$73,000**		
	Commercial Real Estate	SF	$17.00		$0	
	Residential Real Estate	SF	$9.00	18,860	$169,740	
	Commercial Relocation Cost	LS	0		$0	
	Residential Relocation Cost	LS	0		$0	
	R/W Total			**$170,000**		
	TOTAL COST			**$2,168,000**		



WISCONSIN DEPARTMENT OF TRANSPORTATION

JUNE 2011

US 41 - CTH S INTERCHANGE

GEOMETRIC AND SAFETY DEFICIENCY MAP

HNTB

Exhibit

US 41/CTH S
BROWN
COUNTY

WILLIAMS GRANT DR

MID VALLEY DR

US 41

FRENCH RD

EXTEND EXISTING RIGHT TURN LANE FROM 50' TO 125'

REMOVED

CTH S (W. FREEDOM RD)

E. FREEDOM RD

EXTEND EXISTING RIGHT TURN LANE FROM 50' TO 200

MID VALLEY DR

US 41

FRENCH RD

LEGEND

- EXISTING RIGHT OF WAY
- PROPOSED IMPROVEMENTS
- PROPOSED SIDEWALK/PATH
- PROPOSED STRUCTURES
- RIGHT OF WAY ACQUISITION

N

SCALE 0' 150' 300'

WISCONSIN DEPARTMENT OF TRANSPORTATION

JUNE 2011

US 41 - CTH S INTERCHANGE

IMPROVEMENT ALTERNATIVE 1

HNTB

Exhibit

US 41/CTH S
BROWN
COUNTY

Sheet 2 of 4

WILLIAMS GRANT DR

MID VALLEY DR

US 41

FRENCH RD

EXTEND EXISTING RIGHT TURN LANE FROM 125' TO 250'

RE-STRIPE 100' LEFT TURN LANE

ADD 100' LEFT TURN LANE

REMOVED

CTH S (W. FREEDOM RD)

EXTEND EXISTING RIGHT TURN LANE FROM 125' TO 200'

E. FREEDOM RD

ADD 100' LEFT TURN LANE

INSTALL TRAFFIC SIGNALS AT RAMPS

MID VALLEY DR

US 41

FRENCH RD

LEGEND

- EXISTING RIGHT OF WAY
- PROPOSED IMPROVEMENTS
- PROPOSED SIDEWALK/PATH
- PROPOSED STRUCTURES
- RIGHT OF WAY ACQUISITION

N

SCALE 0' 150' 300'

WISCONSIN DEPARTMENT OF TRANSPORTATION

JUNE 2011

US 41 - CTH S INTERCHANGE

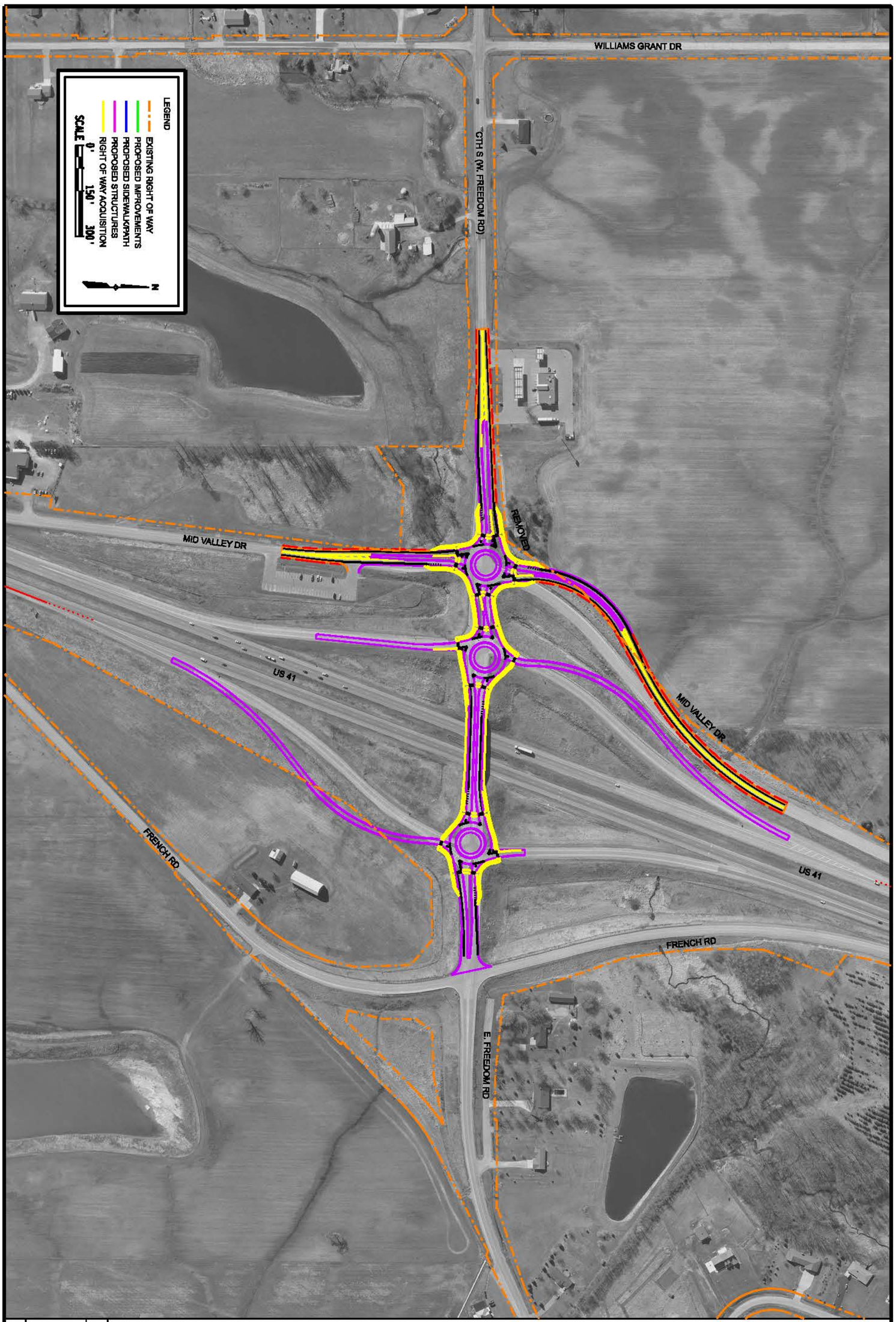
IMPROVEMENT ALTERNATIVE 2

HNTB

Exhibit

US 41/CTH S
BROWN
COUNTY

Sheet 3 of 4



US 41 - CTH S INTERCHANGE

IMPROVEMENT ALTERNATIVE RAB 2020 & 2035

JUNE 2011

HNTB

Exhibit

US 41/CTH S
BROWN COUNTY

Sheet 4 of 4

WISCONSIN DEPARTMENT OF TRANSPORTATION