

APPENDIX T

Project Management

I-41 Traffic and Engineering Study: Decision Log

Updated for 9/12/2019 (DRAFT)

Category	#	Question or Topic	Decision	Notes / Reasoning	Decision made through	Decision Date
Project Management	1	What data is required from NER to begin analysis?	Email to NER requesting available as-builts, crash data, traffic data. Brief plan of attack given for first 2-3 weeks of the contract.	Data request to NER to help start efforts as soon as NTP given.	Email (Bryan L, Joe U)	1/29/2019
	2	Weekly Meeting Minutes / Decision log	- WisDOT = Meeting minutes - Strand = Decision log for IHSDM analysis	Help group track weekly progress and identify best practices.	Calls/Email	3/7/2019
	3	Confirm project limits for forecasting, simulation and safety analysis	Northern limits to be placed north of CTH S	Northern limit of simulation and safety to be set north of CTH S and south of potential new access point. Forecasts to include impacts of potential new access point, but forecasts will not be completed for the new access point.	Weekly meeting / Email	3/11/2019
Schedule	1	Perform 6-lane analysis?	Yes, traffic and safety analysis should each include 6-lane alternative	From meeting discussion: Work to identify aux lane opportunities and evaluate intersections on a case-by-case basis.	Weekly meeting	3/14/2019
	2	Partial Submittals of Base IHSDM Model	- First submittal of base model to WisDOT will not include traffic volumes. - Anticipated delivery around 3/18. <i>Update: Submitted 3/20 to NER, 3/21 to BTO.</i>	Traffic data is being collected by ECWRPC and WisDOT in early March. Traffic analysis team will balance data and provide to Strand, anticipated week of 3/18. <i>Purpose of partial submittal is to help streamline overall review.</i>	Conference call	3/7/2019
	3	Peer review of future VISSIM models	Include review schedule for early June	Future baseline models submitted end of May with scenario modeling to start in July	Email (Bryan L, Jerry S, Joe U)	3/14/2019
	4	Modify schedule based on project limits, change in forecasting	Schedule updated with forecast development changes and BTO/TFS reviews	Delays due to confirming project limits and forecasting assumptions impacting schedule by 2 weeks. - Project limits confirmed for operations modeling (do not include potential Southern Arterial near CTH F) - HNTB developing peak hour and daily forecasts, TFS and others reviewing	Email (Bryan L, Jerry S, Joe U) & Meeting	4/4/2019 & 5/2/2019
Geometry Data	1	Southern Analysis Limit	Between CTH BB and US 10/STH 441	- Allows analysis to include CTH BB NB exit and SB entrance ramps. - Limit is north of recent improvements at the US 10/WIS 441 interchange	Email (Bryan L, Scott N, Joe U)	2/21/2019
	2	Northern Analysis Limit	4-lane to 6-lane expansion point (North of Orange Lane, South of CTH F)	The ~1,600' extension of limits to capture the rest of the 4-lane section in Brown County and account for potential analysis of 6-lane expansion alternative in the future. Follow-up on potential extension to CTH F covered in 3/25/2019 email between NER, BTO, and Strand (limits will remain the same as 2/14 decision).	Initial = Conference Call Follow-up = Email	2/14/2019 & 3/25/2019
	3	Aerial Imagery	Most recent aerials used for analysis: - Winnebago = 2015 (WisDOT) - Outagamie = 2018 (public) - Brown = 2017 (public)	- WisDOT provided Winnebago aerials to Strand. - Strand compiled aerials in CAD using Outagamie Co. coordinate system. - Strand forwarded CAD files/aerials to traffic analysis team.	Email (Bryan L, Joe U)	2/14/2019
	4	Should gapped rumble strip patterns have the gaps coded?	Code gapped rumble strips similar to continuous rumble strips	Each type of rumble strip would operate similarly when driving at 70 mph. The gapped rumble strips are an older design.	Conference call	2/28/2019
	5	Clear Zone	Code 30' width for entire corridor	The clear zone has no effect on crash calculations when outside barrier is present. Where no barrier was present, the clear zone appeared to be 30' or more at the locations Strand reviewed along I-41. The assumption of 30' cancels out the clear zone calculation and fits with the goals of the interim analysis, where right-of-way is not expected to be taken. Revisit with 6-lane option at a later point, if needed.	Email (Scott N, Joe U)	3/25/2019

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Geometry Data	6	Interim Alts	Initial Plan: see 5/23 email and document for potential improvements identified from previous phase. Current Plan: ties current operations analysis to previous recommendations.	Interim Alternative to be modeled includes the following: - Mainline merge extensions at 5 locations. - Interchange/Intersection improvements at STH 96, STH 15, and CTH E. - <i>Test of SB aux lane from STH 47 to STH 15 in IHSDM is TBD (7/11 weekly mtg)</i>	Alternatives Workshop Meeting, Weekly meeting	6/27/2019 7/11/2019
	7	Long-Term Alt	Initial Plan: see 5/23 email and document for potential improvements identified from previous phase. Current Plan: ties current operations analysis to previous recommendations.	Interim Alternative to be modeled includes the following: - Mainline merge extensions at 5 locations. - Interchange/Intersection improvements at STH 96, STH 15, and CTH E. - <i>Test of SB aux lane from STH 47 to STH 15 in IHSDM is TBD (7/11 weekly mtg)</i>	Alternatives Workshop Meeting, Weekly meeting	6/27/2019 7/11/2019
Traffic Data	1	Base year of traffic analysis?	Base Year = 2018	Consistent with DTIM forecast and concurrent operations analysis	Conference call	2/28/2019
	2	Is weigh station traffic data available?	Yes, provided for 2018 and 2017 through DSP on 3/13/2019	- Estimated average use from counts = 150 trucks per day (when open). - NER checked with DSP on committed improvements to help determine if weigh station could be more often if improvements are made. DSP indicated no plans to upgrade at this time (3/19/2019 email with Sergeant Diedrich).	Weekly meeting & Call with Scott N	3/14/2019 4/3/2019
	3	Type of ATR data to use estimate weekend trends?	Annual average data from 2018	- Consistent with traffic analysis base year. - Annual used for Beltline analysis where possible.	Weekly meeting	3/7/2019
	4	Limits to apply weekend trends	As shown in 3/7/2019 slideshow	Outagamie generally split by state highway. Brown has 2 ATRs, both long stretches with CTH interchanges.	Weekly meeting	3/7/2019
	5	Need for counts at various ramp terminals	ECWRPC to collect data	Access to Miovision and Walt wants to get the data	All locations provided aside from CTH U at SB I-41	3/21/2019
	6	Seasonal factors	Utilize the 2017 data	2018 data not yet available	Email from Chris C	3/8/2019
	7	Annual factors	Use geographic-specific factors from mainline ATR's to bring all counts to 2018	Some locations built out with correspondingly lower growth rates	Weekly meeting	3/14/2019
	8	K factor comparison	Based on 2017 ATR data		Email from Chris C	3/6/2019
	9	OD data	Utilize for validation of VISSIM routes	Not available for initial seeding of VISSIM	Weekly meeting	2/28/2019
	10	Estimate data for SB 41 at CTH U	HNTB to estimate 2018 counts at SB 41 and CTH U using provided ramp count data and historic (2007) turning movement data	ECWRPC collected ramp data not turning movement data, so expediting process by estimating data rather than waiting to get location recounted.	Phone discuss with Bryan Lipke	3/14/2019
	11	Approval of Balanced Base Counts	Draft comments received 3/27, addressed and resubmitted 3/29	HNTB addressed comments and resubmitted balanced counts, support documents and diagrams on 3/29	Traffic count phone/Skype meeting	3/29/2019

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Crash Data	1	Obtain crash data beyond DTIM Limits and at intersections	NER to provide available crash data and diagrams	NER provided data beyond DTIM limits, which were STH 96 to Orange Ln, and ramp terminal intersections.	Email (Bryan L, Scott N, Joe U)	2/14/2019
	2	Analysis approach	- Focus on mainline for Empirical-Bayes (EB) analysis to start with. - Ramps and intersections may come later. <u>Initial Interim Alt:</u> Anticipated to use EB analysis for intersections and predictive method for potential STH 125 NB offramp improvement (single to dual) <u>Current Interim Alt:</u> Use EB analysis, where applicable, for intersections at STH 96, STH 15, and CTH E. <u>Long-Term Alt:</u> Use predictive method for analysis of I-41 capacity expansion. Focus on relative differences.	- First priority = mainline. - Ramp terminals and the areas along ramps will be evaluated case-by-case at a later time depending on the study's proposed improvements.	- Kickoff meeting - Weekly meeting (Initial Interim Alt) - Alternatives Workshop Meeting	- 2/21/2019 - 5/30/2019 - 6/27/2019
	3	Crash data location: stationing	Round to nearest 10' mark	Crash locations in police reports are approximate, entering location data into IHSDM to nearest 10' mark is appropriate.	Conference call	2/28/2019
	4	Exclude crashes from EB analysis where there have been recent improvements?	Do not exclude crashes	Review of crash reports complete focusing on recent improvements near WIS 55 (SB on, NB off) and weigh station (NB side) found no significant trends that would result in excluding crashes from EB analysis. Strand to document the analysis.	Weekly meeting	3/28/2019
	5	Have I-41 crash rates been compared to the Beltline?	No, are not planned to be compared at this time.	Walt offered to provide I-41 crash rate information that ECWRPC has calculated.	Weekly meeting	3/7/2019
	6	Include deer/animal crashes?	Analyze mainline using EB <u>with and without</u> deer/animal crashes.	- HSM SPFs include animal crashes. - Traditionally, WisDOT has excluded animal crashes. - WisDOT interested in comparing results (consider as a sensitivity check). - Scott Nelson provided deer listing. - <u>3/28 update:</u> Review found that some locations from spreadsheet (RP coded) differed vs. actual report (police reported). Recommendation during 3/28 weekly meeting was to stick with the data provided (mostly spreadsheet-based from NER) and document the assumption. <i>Strand sent crash data to NER for review 3/29 and discussed further 4/3. Total crashes w/out animal = 1,667, total w/ animal = 1850 (183 total animal crashes)</i>	Weekly meetings	3/7/2019 & 3/28/2019
	7	Crash severity input options for IHSDM	Use FI and PDO	Options available in IHSDM include FI, KAB, or PDO. The FI and PDO categories align with SPFs for Freeways and Speed-change lanes.	Weekly meeting	3/7/2019
IHSDM Coding	1	Initial Peer Review results of base conditions	Initial submittal: Geometry only (no traffic or crash data) completed 3/20.	Review comments provided by NER and BTO on 3/26 for 3/20 geometric submittal.	Email	3/26/2019
		Peer Review results of base conditions (full submittal)	Full submittal (all inputs, geometry comments addressed): Provided to NER 4/15. Review comments rec'd 4/29.	- Full base model submitted 4/15, including evaluations of the corridor with all crashes and with vehicle-only crashes. - "Read-me" file provided with evaluation info and traffic inputs.	Email (BTO, NER, Strand)	Complete 4/29/2019
	2	Urban vs. Suburban vs. Rural	- Urban from South limit to CTH JJ - Rural from CTH JJ to Orange Lane - Urban from Orange Lane to north limit	The CTH JJ border for Urban/Rural is based on WisDOT's urbanized area map for Appleton. North of CTH JJ, WisDOT's urbanized area map identifies CTH JJ to CTH S as rural. Through follow-up with NER, rural portion north of CTH JJ was extended.	Email (Scott N, Joe U)	3/26/2019
	3	Crossroad / Ramp Terminal Coding Test	- Start with CTH E - 2nd in line = STH 15	Coding test to add in a crossroad, connect the service ramps, and create a ramp terminal intersection. Purpose is to trouble-shoot any issues that may occur. CTH E was selected as it's a good candidate for future improvements based on previous short-term improvements analysis. NER concurred with CTH E to start with.	Email (Scott N, Joe U)	3/26/2019

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IHSDM Coding	4	Median Type Coding	Traversable vs. Non-Traversable Median	Kevin found that selecting either “Traversable Median” or “Non-Traversable Median” for the Nominal Median Type does not impact the results. IHSDM uses this field to help pre-populate the highway viewer, but as the model is changed within the editor those values get used. The team will not need to run the model twice to see the difference between the two.	Email (Kevin S, NER, Strand)	3/26/2019
	5	Offset to Median Barrier	Model as-is with V14.0	- IHSDM incorrectly calculating inside shldr-to-barrier values larger than 17 ft. - I-41: few sections over 17' - Comparison between alternatives still useful, as long as we aren’t changing the distance to the median barriers. Document and monitor for expansion alts. - Kevin contacted IHSDM support team, error appears to be fixed in v14.1 (we are using v14.0). Project team will update version as needed.	Initial = Email (Kevin S, NER, Strand) Follow-up = Weekly meeting	3/26/2019 & 3/28/2019
	6	Sensitivity Testing with Base Model	- Animal Crashes - Weigh Station Traffic	- I-41 mainline will be evaluated with and without animal crashes. See Crash Data Item #6. Both evaluations will be compared against one-another and to existing crash data that was entered into the model. Differences in hot spots will be noted. - I-41 mainline will be evaluated with and without Weigh station traffic data to be analyzed with and without truck volumes. The differences in output will be documented and shared with the team. If differences are negligible, likely will stick with one volume analysis method for the rest of the project.	Weekly meeting Phone Call (Scott N, Joe U)	3/7/2019 & 4/3/2019
	7	IHSDM Version	Use V14.0	V14.1 released prior to full base conditions submittal. I-41 base model full base model submittal was in V14.1 to include latest software updates / fixes. Per 4/22 email with NER, project will go back to V14.0 to be consistent with the version WisDOT is using. Differences in output were insignificant.	Email	4/22/2019
	8	Base Model Evaluations	Final Results Submitted 4/25: 1) Crash Frequency Tables 2) Crash Frequency Charts 3) Top 20 Crash Rates (i.e. crash frequency/mile) and Travel Crash Rates 4) IHSDM-generated output 5) Constrained Areas (Gillett St, Railroad)	Items 1-3 are post-processed data created by Strand. The Crash Frequency output is set up to summarize the corridor from interchange to interchange, but is customizable shorter/longer limits. Item 4 is generated from IHSDM and includes segment-by-segment output along with a corridor graph. <u>Additional output to consider:</u> - Consider refined limits for crash frequency tables (e.g. 0.1 mile lengths) - Post-processing of IHSDM-generated graph - Defining direction for speed change lane segments Per 4/22 email coordination, output updated to V14.0. Results re-sent 4/25. <u>BTO and NER:</u> No further comments (4/29). Strand reply given 4/30 & 5/2.	Email	4/29/2019
	9	Base Sensitivity Results: Modeling Methodology for Future Conditions	- Use both crash data sets (Vehicle+Animal, Vehicle-Only) - Include Weigh Station Traffic	- <u>Crash Data Set:</u> Carry forward both crash data sets (Vehicle+Animal and Vehicle-only) for now. Per 9/9/2019 email with NER, use vehicle+animal crashes for Safety Certification efforts. - <u>Weigh Station Traffic:</u> Carry forward "Weigh Station Open" volumes for all future conditions modeling. Differences were negligible with and without weigh station traffic in base conditions. The weigh station is open more often than closed.	Weekly meeting Email with Scott N	5/2/2019 9/9/2019

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IHSDM Coding	10	Analysis Timeframe(s) for Future conditions	- No-Build (2028 to 2037 to compare with Interim) - Interim Alts (2028 to 2037). Confirmed on 5/30 based on upcoming project with May 2023 PS&E. - Long-term Alt (2028 to 2037). Confirmed with 7/30 email based on information submitted to TPC.	Draft study forecasts: - Existing = 2018, - Interim = 2028 (No-Build = Build, <i>see Traffic Forecasting item #3</i>) - Horizon year = 2048 (No-Build & Build) <i>Discussion from 5/9:</i> 2028 and 2048 No-Build inputs to be developed first for IHSDM. Build (+1) and other potential interim improvements (additional aux lanes, etc.) to be discussed at a later date. Programming of improvements could be as early as 2026. Use 2028 as anticipated interim improvement year for consistency with forecasts.	Weekly meeting Email (Long-Term)	5/9/2019 & 5/30/2019 7/30/2019
	11	Peer Review results of No-Build conditions	NER and BOT Review complete as of 6/6/2019	No-Build model and supporting materials (traffic inputs, draft results) submitted 5/28 to NER.	Weekly meeting	6/6/2019
	12	Future No-Build Sensitivity Testing: Peak Spreading	Documentation exercise only. Explain potential inputs with peak spreading included and analysis limitations.	Originated from 5/30 weekly meeting discussion. The operations analysis is handling peak spreading as a "what-if" exercise. Group discussed limitations with peak spreading in relation to IHSDM analysis. Strand to explain further in memo.	Weekly meeting	6/20/2019
	13	Peer Review results of Interim Alternative	- <i>Initial results presented at 6/27 meeting. Revisions based on meeting decisions and internal QC complete, IHSDM models and results submitted to NER 7/19.</i> - <i>Updated one-pager results and sensitivity test submitted 7/30.</i>	Submittal includes test of varying high-volume hours at merge locations, reduced cross section along STH 15, and Empirical-Bayes analysis at intersections (where applicable). Preliminary results are shown with detailed summary tables and as one-pager w/ map.	Weekly meeting	8/12/2019
	14	Peer Review Results of Long-term Alternative	IHSDM Model and supporting materials/results submitted 8-7-2019 to NER after call to discuss preliminary results. - Sensitivity test results related to existing conditions median barrier submitted 8-8 (No-Build model, geometric inputs, draft results, etc.)	- Include westbound C-D road from STH 441 to CTH E based on HCS operations analysis per discussion at 7/11/meeting. - IHSDM input development was based on the previous phase of the study and any additional changes due to updated traffic operations. - BTO/NER confirmed review of the model was complete 9/5.	Weekly meeting	8/12/2019 & 9/5/2019
Travel Demand Modeling	1	SE Input files	Coordinated with ECWRPC and WisDOT forecasting for current versions of TDM input files	Various files provided with no timestamps	Shared mapping, addressed comments during weekly meetings	3/15/2019
	2	Committed roadway improvements	Incorporate all modeled committed and planned projects except WIS 96 expansion	WIS 96 expansion is not currently anticipated	Weekly meeting	3/14/2019
	3	Scenario for forecasting	Add one lane each direction	Decision made to model future build scenario to include 8 lanes from southern limit to WIS 15, and 6 lanes from WIS 15 to northern limit. Includes new interchange between CTH S and CTH F in Brown County related to new southern river crossing.	Weekly meeting	3/28/2019
	4	No interim year forecasting	Model only 2010 and 2045	No accurate socio-economic datasets exist for interim years	Weekly meeting	3/7/2019
	5	Submit DT1601	HNTB to submit to Matt Halada	HNTB to submit with demand modeling input and output files along with balanced counts, count factors and raw traffic count data used during project	Weekly meeting	3/29/2019
	6	Develop peak hour forecasts	TFS does not provide peak hour forecasts	HNTB and TFS discussed methodology to develop peak hour traffic forecasts for use within VISSIM. HNTB to conduct forecasting analysis.	Meeting on 4/8/2019	4/8/2019

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Travel Demand Modeling	7	Confirm Future Year Scenarios	Include Southern Arterial in future baseline	Include Southern Arterial bridge, interchange and associated improvements shown as planned in the NERTDM for future baseline and subsequent scenarios	Email from Chris C 4/11/2019	4/11/2019
Vissim Modeling	1	Version	V10	WisDOT not using V11 currently	Email (Ben R, Jason K)	3/15/2019
	2	Peer Review Results (round 1)	Base network	HNTB addressing comments, will resend networks to BTO 4/12	Weekly meeting	4/19/2019
	3	Analysis intervals	Times to be modeled in VISSIM	BTO requested VISSIM models to include one hour warm up, one hour analysis and one hour cool-down. Develop traffic demands at the 15 minute level.	Weekly meeting	3/28/2019
	4	Calibrated Base Vissim Review	HNTB to submit calibrated base VISSIM models	HNTB to send calibrated base VISSIM models to BTO 4/19 (AM and PM with network updates and volume and speed calibration)	Weekly meeting	4/19/2019
	5	Optimizing Signals	No-Build scenarios will include optimizing traffic signals	HNTB to report intersections with undesired operations with both existing signal timings and optimized signal timings.	Email confirmation	5/23/2019
	6	MOE's for scenario development	Level of service (LOS), with LOS D as acceptable for mainline and a LOS of mid-E for cross streets.	Consistent with FDM for desired LOS by roadway hierarchy.	Weekly meeting	6/6/2019
	7	Scenario development process	HNTB to use Synchro, VISSIM and HCS collectively to develop operational improvements	t	Weekly meeting	6/6/2019
	8	NoBuild peer review comments responded to	NoBuild Analysis files resubmitted 6/28/2019	Updated analysis to include HCM6 results and HCS7 results for roundabouts	Email / FTP	7/22/2019
	9	Short Term Models Submitted for Peer Review	Short Term Analysis files submitted 6/28/2019	Short term alternative was presented during the workshop (6/27/2019). Formal Results submitted for Peer Review.	Email / FTP	7/22/2019
	10	Long Term Models	HNTB to analyze the previous 2008 Recommendations	HNTB analyzed 2008 recommendations, then updated where deficiencies remained. Notable items include WIS 47 and N system interchange area.	Weekly Updates	7/25/2019
	11	Long Term Improvements	Include Long Term improvements South of EIS project limits?	Keep mainline of I-41 as 6 lanes south of WIS 15 and upgrade the existing CTH BB interchange with traditional signalized improvements in lieu of full conversion to roundabouts for VISSIM modeling purposes.	Weekly meeting	7/25/2019
	12	2048 Short Term Models Submitted for Peer Review	2048 Short Term Analysis files submitted 7/30/2019	All items accepted.	Email confirmation	8/12/2019
	13	2048 Long Term Models Submitted for Peer Review	2048 Long Term Analysis files submitted 8/2/2019	HNTB resubmitted all VISSIM and Synchro models to address original comments on 8/30/2019.	Pending Approval	

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Traffic Forecasting	1	Peak Spreading	To be included in the 2048 NoBuild Peak Forecasts	HNTB to consider peak spreading. Will be an iterative process to determine a reasonable amount of spreading	Weekly meeting	4/8/2019
	2	Negative Growth Rates	Per WisDOT Policy, HNTB to use 0% minimum growth	1 Site observed in the demand model (SB Entrance ramp from WIS125)	Phone Call (Chris & Jason)	4/29/2019
	3	2028 Build Daily Forecasts required	HNTB to assume 2028 NoBuild and 2028 Build forecasts are equal.	In lieu of an Interim year demand model and only ~18% volume difference between 2045 NoBuild and Build TDM assignments, the difference between 2028 no build and build is anticipated to be negligible. Further discussions on the need for separate no build and build forecasts were had with Joe U for the IHSDM (he indicated IHSDM will interpolate between 2018 and 2045 Build or No Build, so no 2028 forecasts required) and with Ben R (indicated the 2028 build VISSIM would not be a critical assessment but rather the 2028 no build and the 2048 build to assess congestion levels at the design year). Decision was made to produce 2028 forecast that represented the no build condition.	Phone calls with TFS, Joe U and Ben R on May 3, 2019.	5/3/2019
	4	2048 NoBuild Peak Spreading	Use a demand threshold value that moves demands up to 30 minutes only	Documentation and final recommendation approved	Email (Chris C)	6/5/2019
	5	2048 Build AM/PM Volumes	Update 2048 Build Volumes to include C-D Alternative recommended in the 2008 ops study.		Email	7/3/2019
	6	2048 Build Daily Volumes	Updated 2048 Build Daily Volumes	Submitted updated Build Daily Volumes with CD System alternative	Email	7/11/2019
Design and Cost Estimates	1	Reconstruct STH 47 Interchange	NER inquired about rebuilding the STH 47 structure over I-41 in lieu of widening existing structure	HNTB modifying design and cost estimates to incorporate a new structure carrying STH 47 over I-41. Additional pavement work to be included to modify recently rebuilt ramp terminals, but maintaining majority of infrastructure.	Pending Approval	
	2	Cost Estimate Software and Format	NER to determine which cost estimation format to use.	NER determining which cost estimation tool should be used, as Majors and Backbone have separate tools currently.	Pending Approval	
	3	Concrete Barrier inclusion	Comment to include "Optional Concrete Barrier" in cost estimate	HNTB adding a line item to the cost estimate to detail the approximate cost of adding concrete barrier wall between the mainline and frontage roads south of DePere.	Pending Approval	