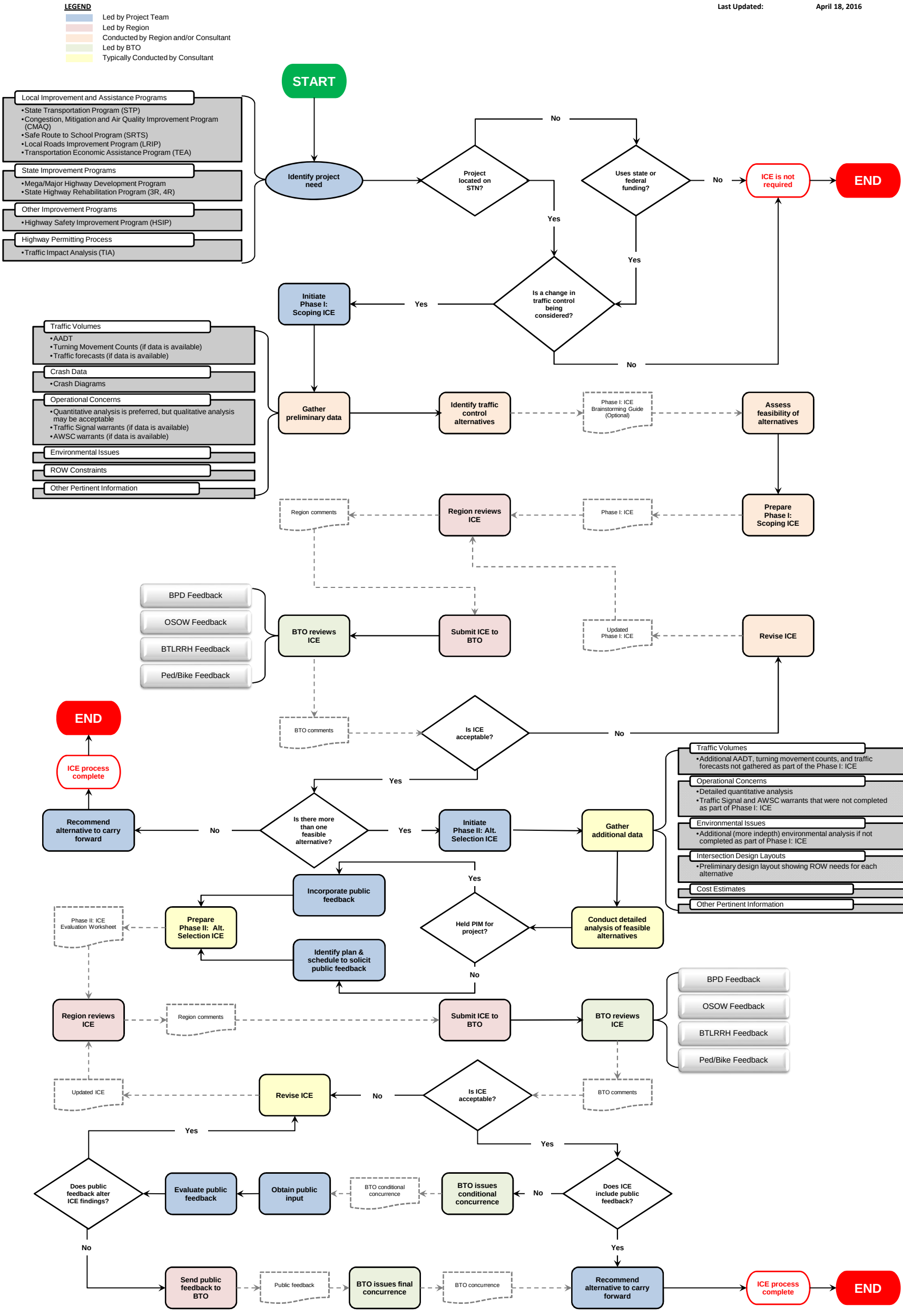
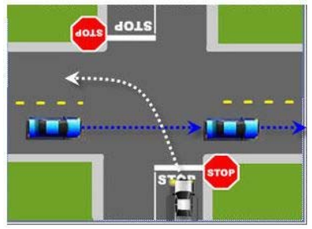
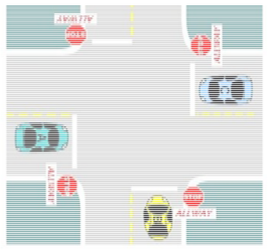
Facilities Development Process - State Highway Rehabilitation (SHR)

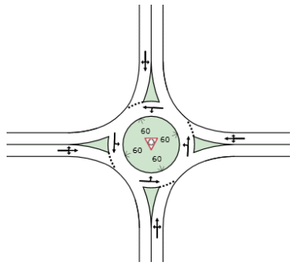
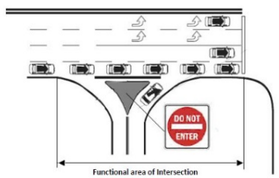
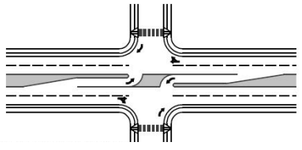
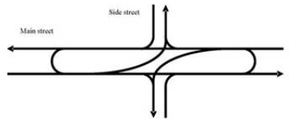
Phase Elements / Phase Names		Program Development	Project Management Plan	Project Resourcing	Preliminary Impact Review	Design Study	PS&E	Design Project Closeout		
Life Cycle (Construction ID)		00	10	11		12	15	20		40
Milestone			Project Start; Project Management Plan Approved; Begin Design		Preliminary Impact Review Complete	Design Study Report Approved	PS&E Complete	Project LET		Project Award
Timeline				6 months minimum for consultant resourcing (if required)	Begin Design date based on scope elements of project		Design Study Report Approved date based on scope elements of project and provides time to complete utility coordination and moves, real estate acquisition and railroad coordination			
Deliverables (Deliverables listed may have been started in a previous phase but must be completed prior to advancing to the next phase)	Scope	- Program Level Scope	- Project Level Scope		- Project Level Scope reviewed	- Project Level Scope verified				
	Schedule	- Reference Schedule - Program Let Schedule	- Control Schedule - Detail Schedule - Let schedule date		- Control Schedule reviewed - Detail Schedule reviewed - Let schedule date reviewed - Non-Let schedule dates	- Control Schedule reviewed - Let schedule date verified - Non-Let schedule dates verified				
	Budget	- Program Level Construction Estimate	- Design Delivery Budget - Construction Estimate		- Construction Estimate - Non-Let Estimate	- Construction Estimate - Non-Let Estimate	- Construction Estimate	- Construction Estimate		
	Phase Deliverables	- Design ID Authorization - Highway Improvement Type - Signed SMFA (design connect. hwy.)	- Purpose and Need - Scoping Level Intersection Evaluation (ICE) - Safety Screening Analysis (SSA) - Risk Assessment - Project Management Plan documentation	- Assignments for resources - Executed consultant contract (if required) - Risk Assessment	- Alternative Selection ICE - Draft Preliminary Plan - Environmental Impacts - Utility Impacts - R/W Impacts - Railroad Proj. Submittal Package - Signed SMFA & SMMA (const.) - Risk Assessment	- Preliminary Plan - Preliminary Structure Plan - Signed Environ. document - Signed DSR - Preliminary Plat - Risk Assessment	- PS&E package - PS&E exceptions - Permits - Risk Assessment	- Plan check revisions - Advertisement for bid - Addenda (if required) - Risk Assessment	- Review bids	- Design ID Closed
Phase Activities		see FDM Chapter 3 - attachment 1.2								
Change Management		Approved Project Management Plan establishes the original baseline for applying Change Management process.		Change Management process in effect						
Link to Performance Measures										

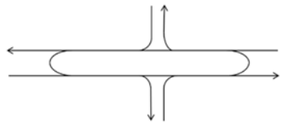
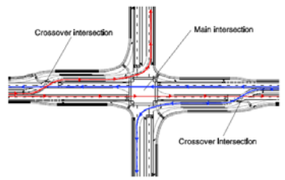
updated 11/14/2016

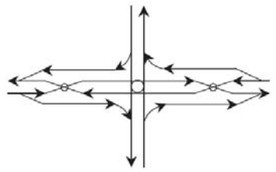
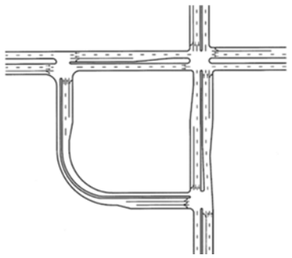
FDM 11-25 Attachment 3.2 Intersection Control Evaluation (ICE) Process Flow Chart

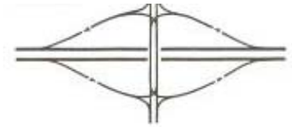
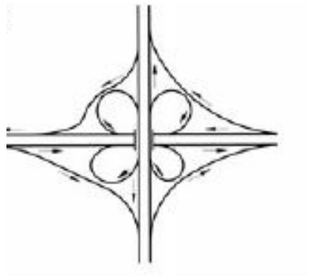


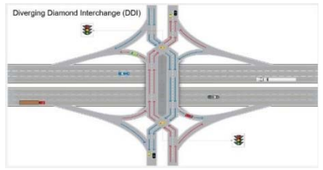
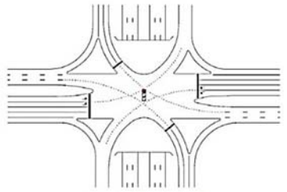
Control Type	When to Consider	Potential Benefits	Potential Concerns	Other Considerations	Additional Information
Intersection Control Types					
Minor Road Stop Control  Vehicles on the minor road stop and wait for a sufficient gap before making their desired movements, while mainline traffic does not stop.	- Major and minor road functional classification are clearly defined - Low minor road volume, especially for through and left movements - Major road mobility is the primary concern - Signal warrants not met - AWSC warrants not met	- Major road delay is nonexistent or minimal - Inexpensive to install and maintain - Clearly defines which vehicles have the right-of-way	- Higher major road volumes reduce minor road gap availability and can result in high delays - Significant sight distance can be required when the major road operates at higher speeds - Potential for high-severity angle crashes, especially with higher major road speeds	- Least restrictive form of intersection control - Often appropriate for low-volume county and/or local roads that intersect with STN routes - Wide, open medians can be used for two-stage crossings	FDM 11-25-3.1.2
All Way Stop Control  All vehicles stop before making their desired movements. Right-of-way is assigned based on arrival time.	- Balanced traffic volumes - ROW or sight distance constraints - AWSC warrants met - Signal warrants not met - Maintaining major street through movements as free flow is not the primary concern - Relatively low approach speeds	- Can be very safe - Requires minimal ROW and sight distance - Inexpensive to install and maintain	- Operationally inefficient under most conditions - Higher vehicle emissions due to required stopping	- AWSC is not preferred as a permanent solution on the STN, especially if there are other viable alternatives - AWSC may be appropriate as an interim solution - Wisconsin-specific AWSC warrants apply in addition to MUTCD AWSC warrants - May not be suitable for intersections with three or more approach lanes	FDM 11-25-3.1.2 TGM 13-26-5 MUTCD 2B.07 (http://mutcd.fhwa.dot.gov/htm/2009r1r2/part2/part2b.htm)
Traffic Signal (Signal)  Right-of-way is assigned by traffic signal indications.	- Available gaps are not adequate to complete desired movements under less restrictive control - Signal warrants met - Nearby intersections are signalized and coordination is possible	- Can be coordinated with other signals to provide desired progression - Flexibility can be achieved via timing adjustments - Adaptive control can be implemented along a signalized corridor - Pedestrians are assigned crossing times rather than having to find gaps	- Major road delay is often greater than it is under less restrictive control - Severe right-angle crashes can occur due to red light running or poor visibility of the signal heads - May require additional ROW to accommodate dedicated turn lane requirements and wider approaches - Pedestrians may face long crosswalks and conflicts with vehicles approaching from multiple direction - Can experience extensive queuing, especially with longer cycle lengths	- Preferred control when railroad or lift-bridge pre-emption is required - Access control should be implemented in the vicinity of the intersection - Accommodation of larger vehicles, including OSOW, can be challenging but may be addressed with unique design considerations	FDM 11-25-3.1.2 TSDM Chapter 2 Signal Warrants - (http://wisconsindot.gov/dtsdManuals/traffic-ops/manuals-and-standards/tsdm/02/warrant-analysis-test.xlsx)

Control Type	When to Consider	Potential Benefits	Potential Concerns	Other Considerations	Additional Information
Roundabout (RAB)  Vehicle speeds are reduced via geometry approaching the intersection. Entering vehicles yield to circulating vehicles.	- Relatively balanced traffic volumes - Signal or AWSC warrants met - Significant crash history, especially angle crashes - Unconventional geometry (5 or more legs, high skew, etc.) present	- Geometry and lower speed reduces potential for sever right-angle crashes - Lower vehicle emissions as a result of limited stopping and idling - Can reduce number of approach lanes, and therefore approach width and ROW requirements along the roadways - Can have traffic calming effects - Can accommodate closely spaced intersections better than other traffic control options - Allows for convenient U-turn movement - Pedestrians face traffic from only one direction at a time and have shorter crosswalks	- Coordination not possible - May require additional ROW at the intersection to accommodate the center island and circulating roadway - No flexibility in assigning priority - All vehicles are required to slow down from free-flow speeds - Operations may deteriorate significantly under congested conditions - Pedestrian crossings are uncontrolled	- Accommodation of larger vehicles, including OSOW, can be challenging but may be addressed with unique design considerations - Consider need for expandable design (e.g., one lane to two lanes) - Single-lane roundabouts are preferred to multi-lane roundabouts - Access control should be implemented in the vicinity of the intersection	FDM 11-25-1.1.2 FDM 11-25-3.1.2.3 FDM 11-26 FHWA RAB Guide: (http://www.fhwa.dot.gov/publications/research/safety/00068/00068.pdf)
Right-In/Right-Out (RI/RO)  Left turns into the minor road and through and left movements out of the minor road are not permitted.	- History of angle crashes involving minor street through/left and/or major street left movements - Other intersections nearby to facilitate restricted movements - Intersection encroaches on the influence area of an adjacent intersection - Signal warrants not met - AWSC warrants not met	- Crossing conflicts are eliminated so overall safety is increased - Operations at the intersection are enhanced due to elimination of minor road through and left movements and major street left movement	- Access at the intersection is severely reduced - generally not favored by businesses - Adjacent intersections may be adversely affected as vehicles will be forced to execute turning maneuvers at locations other than the restricted access intersection - Travel time may increase for drivers wanting to make minor road left/ through movements and/or major road left turn movements at this location	- Emergency vehicles looking to make a minor street through or left movement face longer, more complex routes, though traffic control delay may be reduced	
Right-In/Right-Out/Left-In (3/4 access)  Through and left movements out of the minor road are not permitted.	- History of angle crashes involving minor street through/left movements - There is not a significant history of crashes involving the major street left turn movements - Signal warrants not met - AWSC warrants not met	- Crossing conflicts are significantly reduced so overall safety is increased - Operations at the intersection are enhanced due to elimination of minor road through and left movements - Provides more access than RI/RO - All movements from the mainline are maintained - May be more palatable to businesses than RI/RO	- Access at the intersection is reduced for exiting vehicles from the minor road - Adjacent intersections may be adversely affected as vehicles will be forced to execute turning maneuvers at locations other than the restricted access intersection - Travel time may increase for drivers wanting to make minor road left turn and through movements at this location	- Emergency vehicles looking to make a minor street through or left movement face longer, more complex routes, though traffic control delay may be reduced	
J-Turn (RCUT)  Through and left movements out of the minor road are not permitted. U-turns are provided downstream in the median to facilitate these movements.	- History of angle crashes, especially far-side - Located on a high-speed, divided facility - Located in a relatively rural area with significant intersection spacing - Signal warrants not met (for unsignalized rural expressway applications) - AWSC warrants not met	- Crossing conflicts are significantly reduced, so overall safety is increased - Vehicles only have to focus on finding a gap in one direction of traffic at a time - Operations at the intersection are enhanced due to elimination of minor road through and left movements - U-turns are handled within the intersection and will not affect adjacent intersections - May be more palatable to businesses than RI/RO	- Minor street through and left movements are more indirect than at a traditional intersection; travel distance is increased - Direct access to the major road in between the intersection and the U-turns is typically removed - Clearly signing the intersection to instruct unfamiliar drivers how to navigate it can be difficult	- Larger vehicles may have to be accommodated with a “loon” at the U-turn - The weave from the minor road to the U-turn is critical and may be a controlling factor - This may not be feasible on some curves - Analysis methods are currently in development - Bicycle and pedestrian crossings can be maintained through the center of the J-Turn - Emergency vehicles looking to make a minor street through or left movement face longer, more complex routes, though traffic control delay may be reduced - It is possible to have a corridor of signalized J-Turns/RCUTs	FDM 11-25-1.3.2 FHWA RCUT Informational Guide (http://safety.fhwa.dot.gov/intersection/alter_design/pdf/fhwasa14070_rcut_infoguide.pdf)

Control Type	When to Consider	Potential Benefits	Potential Concerns	Other Considerations	Additional Information
Median U-Turn/Modified J-Turn  Left turns into the minor road and through and left movements out of the minor road are not permitted. U-turns are provided downstream in the median to facilitate these movements.	- History of angle crashes, especially far-side - Located on a high-speed, divided facility - Located in a relatively rural area with significant intersection spacing - Major street left turn volumes are low - There is a history of crashes involving the major street left turn movements - Signal warrants not met (for unsignalized rural expressway applications) - AWSC warrants not met	- Crossing conflicts are eliminated, so overall safety is increased - Vehicles only have to focus on finding a gap in one direction of traffic at a time - Operations at the intersection are enhanced due to elimination of minor road through and left movements and major street left movement - U-turns are provided within the intersection and will not affect adjacent intersections	- Minor street through and left movements and major street left movement are more indirect than at a traditional intersection; travel distance is increased - Direct access to the major road in between the intersection and the U-turns is typically removed - Both mainline and side road movements have to be accommodated at the U-turn locations - Clearly signing the intersection to instruct unfamiliar drivers how to navigate it can be difficult	- Larger vehicles may have to be accommodated with a “loon” at the U-turn - The weave from the minor road to the U-turn is critical and may be a controlling factor - This may not be feasible on some curves - Analysis methods are currently in development - Emergency vehicles looking to make a major street left movement or minor street through or left movement face longer, more complex routes, though traffic control delay may be reduced	FDM 11-25-1.3.2 FHWA RCUT Informational Guide (http://safety.fhwa.dot.gov/intersection/alter_design/pdf/fhwasa14070_rcut_infoguide.pdf)
Displaced Left Turn (DLT)/Continuous Flow Intersection  Major street left turns cross over to the other side of the roadway upstream of a signalized intersection. They can then complete their movement while the opposing through vehicles are also moving.	- High volume of traffic - Signal warrants are met - Urban or suburban setting - Intersection expected to reach capacity for a traditional signalized intersection - Heavy left turn volumes	- Since the left turn is relocated, the left turn phase is eliminated and this green time can be distributed to other movements - Throughput can be increased 10-30%, based on flow balance and whether the DLT is partial or full. Delay can be reduced by 30-80% - Fewer conflict points can result in a safer intersection	- More ROW is required to accommodate the crossovers - This intersection type can be unfamiliar or uncomfortable for drivers - Design standards are not fully developed - Coordination with other signals could be impacted - Access must be restricted within the vicinity of the intersection - Additional signals are needed - Increased efficiency of intersection might result in increased traffic demand at downstream intersections - Bicycle and pedestrian accommodations can be more complicated - Some potential for wrong-way entry from side road right-turns	- It is possible to have a corridor of DLT intersections	FDM 11-25-3.1.2 FHWA DLT Informational Guide (http://safety.fhwa.dot.gov/intersection/alter_design/pdf/fhwasa14068_dlt_infoguide.pdf)
Continuous Green-T  Right-of-way is assigned by traffic signal indications, with one of the major street approaches always having a green light as minor street left turns merge from the left.	- Intersection has three legs, typically two major street approaches and one minor street approach - Signal warrants are met	- One of the major street movements will be free-flow, reducing potential delay - Safety can be improved	- The minor street left movement joins major street through traffic from the left with a merge maneuver, which is contrary to driver expectations	- Analysis of operations can be difficult given software limitations	FHWA Continuous Green T Case Study (http://safety.fhwa.dot.gov/intersection/innovative/others/casestudies/fhwasa09016/)

Control Type	When to Consider	Potential Benefits	Potential Concerns	Other Considerations	Additional Information
Double Crossover Intersection (DXI)  Major street vehicles going through or left cross over to the other side of the road at a signalized intersection upstream of the main intersection. Left turns are then unopposed. Remaining vehicles cross back over at a downstream signal.	- High volume of traffic - Signal warrants are met - The setting is urban or suburban - The intersection is expected to reach capacity for a traditional signalized intersection - There are heavy left turn volumes - The intersection is not part of a coordinated corridor	- Reduced-signal phasing (2 phases total) - Left turns are free-flow – conflict removed - Potential for right angle crashes reduced - Capacity can be increased over a traditional signal	- Can be disorienting to drivers who may not know where to look for conflicting traffic, and may realize they are on the “wrong” side of the road - Increased potential for wrong-way driving - Unusual pedestrian crossing patterns - Difficult to coordinate with adjacent intersections - At least one additional signal is added to the intersection	- Newer type of intersection – drivers and public may be unfamiliar or cautious - Vehicles are unable to exit and reenter mainline (Emergency, OSOW, unfamiliar drivers, etc.)	Double Crossover Intersection TRB Article (http://trrjournalonline.trb.org/doi/pdf/10.3141/1912-04)
Quadrant Roadway Intersection/Jughandle  For one approach, left turns are completed upstream of the main intersection via a right turn onto a secondary roadway followed by a left turn onto the desired roadway.	- The intersection has a high volume of through movements and left turns	- By removing turning movements, the main intersection of the two major roadways can function more efficiently - Reduced-signal phasing (2 phases total) at the main intersection - May provide safer pedestrian crossing opportunities vs. high speed interchange ramps	- A large amount of ROW is required, especially if used in more than one quadrant - Additional intersections are created and turning movements become more complex - The intersection area can be difficult to sign and confusing and/or unexpected for unfamiliar drivers (drivers need to turn right to go left)	- The crossing roadways can be grade-separated, the loop maintains access even with the overpass - The jughandle version of this intersection implies a tighter loop that may be unidirectional and be free-flow rather than creating an additional intersection	FHWA Quadrant Roadway Intersection Technical Summary (http://www.fhwa.dot.gov/publications/research/safety/09058/09058.pdf)

Control Type	When to Consider	Potential Benefits	Potential Concerns	Other Considerations	Additional Information
Interchange Control Types					
Diamond  Vehicles enter and exit the highway via ramps that start or end at the intersecting roadway. These intersections can be controlled by stop signs, roundabouts, or traffic signals.	- Traffic volumes, especially on the ramps, are not high enough to need another interchange type - The major street (freeway) has a much higher functional class than the minor street	- Less ROW is required for this interchange type than for others - There are no weaving or crossing movements between the ramp and freeway traffic - The appropriate intersection control can be chosen for the ramp terminals, allowing flexibility	- The minor street cannot be another freeway so diamonds are only appropriate for service interchanges		FDM 11-30-1.3.1
Free-Flow Interchanges  Vehicles enter and exit the highway via free-flow ramps.	- High volumes experienced for multiple movements - Significant ROW is available in the immediate vicinity of the interchange	- Ramp movements are free-flow - Reduces left turn conflicts	- A large amount of ROW is required - One-sided weaving between traffic getting on and traffic getting off occurs and is often a limiting factor - Speeds can be low on tight ramp curves - Trucks can have difficulty negotiating tight ramp curves - Generally not compatible with pedestrians and bicycles		FDM 11-30-1.3.3
Partial Cloverleaf (Par-clo)/Loop Ramps  Some vehicles enter and exit the highway via free-flow ramps while others use ramps with intersections.	- Constrained ROW in one or more (but not all) quadrants - Several high-volume movements	- Movements can be turned into free flow - Converts some left-turn movements into right-turn movements	- Speeds can be low on tight ramp curves - Trucks can have difficulty negotiating tight ramp curves - Free-flow movements are not pedestrian friendly - Increased potential for wrong-way driving	- Free-flow movements can require more length for acceleration / deceleration / merging - Not as conducive to ramp-off / ramp-on movements	FDM 11-30-1.3.3

Control Type	When to Consider	Potential Benefits	Potential Concerns	Other Considerations	Additional Information
Diverging Diamond Interchange (DDI)  Vehicles enter and exit the highway via ramps that begin or end at the intersecting roadway. These intersections are controlled by traffic signals. Intersecting roadway traffic crosses over to the opposite side of the roadway, allowing unopposed left turn movements to the highway. Remaining traffic then crosses back over.	- Volumes for left turns to or from the minor street are dominant - Volume for through movements on the arterial are relatively low	- Reduced-signal phasing (2 phases total) - Left turns are free-flow – conflict removed - Potential for right angle crashes reduced - Capacity can be increased over a traditional signal	- Potential issue for right-turners from exit ramp, who may not know where to look for conflicting traffic - Potential driver expectancy issue with driving on the "wrong" side of the road - Increased potential for wrong-way driving - Unusual pedestrian crossing patterns - Difficult to coordinate with adjacent intersections	- Newer type of interchange – drivers and public may be unfamiliar or cautious - Driver acceptance appears to be good - Not as conducive to ramp-off / ramp-on movements - The region shall facilitate an independent peer review of the design for a DDI prior to making any commitments towards construction	FDM 11-25-1.1.2 FDM 11-25-3.1.2 FHWA DDI Informational Guide (http://www.safety.fhwa.dot.gov/intersection/alter_design/pdf/fhwasa14067_ddi_infoguide.pdf)
Single Point Interchange (SPI)  Vehicles enter and exit the highway via ramps that begin or end at a single intersection with the other roadway	- ROW availability is limited - Left turns are a dominant movement	- Opposing left turns can move simultaneously - One signal controls the interchange so no coordination is required - ROW requirements are reduced	- Structure costs can be significant due to intersection size - Signal phasing can require longer yellow and all-red periods due to intersection size - The design is not conducive to bicycle or pedestrian traffic - If the arterial intersects below the freeway, there may be concerns over lighting and signal head placement	- Effects on interchange safety seem to vary - The region shall facilitate an independent peer review of the design for a DDI prior to making any commitments towards construction	FDM 11-25.1.1.2 FHWA Alternative Interchange Report (http://www.fhwa.dot.gov/publications/research/safety/09060/009.cfm)
Echelon  One approach of the intersecting roadway is elevated via a structure. Two separate intersections are created. Turning movements that require moving from one intersection to another can be accomplished via ramps.	- A large intersection is operating at or near capacity - The intersection is part of a high-volume, signalized urban street system	- Capacity is higher than at-grade intersections - ROW impacts can be limited since grade separation is introduced	- Structures are involved, which dramatically increases the cost of the intersection - Access is reduced - Some movements may require left-hand merges	- The region shall facilitate an independent peer review of the design for a DDI prior to making any commitments towards construction	FHWA Alternative Interchange Report (http://www.fhwa.dot.gov/publications/research/safety/09060/009.cfm)

Phase I: ICE Memorandum Worksheet

(Form available on Traffic Operation Manual website under Intersection Control Evaluations (ICE) at http://wisconsindot.gov/Pages/doing-bus/local-gov/traffic-ops/manuals-and-standards/manuals.aspx)

PHASE I: ICE MEMORANDUM

BUREAU OF TRAFFIC OPERATIONS

To: → DOT ICE Review

From: → ICE Submitter

Date: → Click here to enter a date.

RE: → Project ID #

Intersection Name

→ City/Town/Village, County

→ Choose an item.

Project Description:

Include the need for project, scope of project, and existing conditions.

Alternatives:

If the Phase I: ICE Brainstorming Guide is not used, please list ALL alternatives considered with a brief description. Reference the Phase I: ICE Brainstorming Guide as appropriate.

Safety Considerations:

Include a crash diagram or other method to demonstrate safety concerns.

Operational Analysis:

Summarize operational concerns and/or evaluate warrants and conduct capacity analysis using the latest HCM edition.

Other Considerations:

Include any other factors or information that affected the decisions resulting from the scoping analysis.

Feasibility of Alternatives:

If the Phase I: ICE Brainstorming Guide is not used, please discuss the feasibility of each of the altnernatives identified. Reference the Phase I: ICE Brainstorming Guide as appropriate.

Conclusion:

Summarize which alternatives are moving forward to the Phase II: Alternative Selection ICE.

Attachments:

Please provide all attachments as outlined in FDM 11-25-3 Attachment 3.4

Phase I: ICE Brainstorming Guide Worksheet

(Form available on Traffic Operation Manual website under Intersection Control Evaluations (ICE) at http://wisconsindot.gov/Pages/doing-bus/local-gov/traffic-ops/manuals-and-standards/manuals.aspx)

Phase I: ICE Brainstorming Guide

Date: _____ **Intersection:** _____
Project ID: _____ **Reason for ICE:** _____
Control: _____
Major Road AADT: _____
Minor Road AADT: _____

List of Alternatives:

Alt. #	Control Type	Viable Alternative ?	Addresses reason for ICE?	Performance measures acceptable?	ROW impacts acceptabl	Meets Warrants? (If Applicable)	Manually Exclude?	Manually Accept?	Explaination/Comments
1	Minor Road Stop Control	-							
2	All-Way Stop Control	-							
3	Traffic Signal	-							
4	Roundabout	-							
5	Right-In/Right-Out	-							
6	Right-In/Right-Out/Left-In	-							
7	J-turn	-							
8	Median U-Turn	-							
9	Displaced left Turn	-							
10	Continuous Green-T	-							
11	Echelon	-							
12	Diamond	-							
13	Cloverleaf/ Partrial Cloverleaf	-							
14	Diverging Diamond	-							
15	Single Point	-							
16	[Add more as needed]	-							

Phase II: ICE Worksheets

(Form available on Traffic Operation Manual website under Intersection Control Evaluations (ICE) at http://wisconsindot.gov/Pages/doing-bus/local-gov/traffic-ops/manuals-and-standards/manuals.aspx)

Phase II: ICE Worksheet

BUREAU OF TRAFFIC OPERATIONS

Project and Analyst Information:

Project ID:
Type of Project: Choose an item.
Location:

Name of Analyst:
Agency:
Date of Analysis:

Background Information:

Need for Project: Ex: Operations, Safety, etc.
Other Information: Please describe the scope of the project, the existing conditions, any constraints, and if previous work has been done.

All Alternatives:

Existing Crash Information:

Please fill out the following table with the intersection crash data and include the crash diagram as an attachment.

Crash Type	Severity					TOTAL
	K	A	B	C	PD	
Right Angle						0
Left Turn						0
Rear End						0
Sideswipe - Opposite						0
Sideswipe - Same						0
Merging						0
Head On						0
Hit Object						0
Run Off Road						0
Pedestrian/Bicycle						0
Overturn						0
TOTAL	0	0	0	0	0	0

Analysis Years: Ex. 2010 - 2014
Crash Rate: # crashes/MEV
Crash Trends:

Additional Modes of Transportation:

Please fill out the following table, adding rows as needed for each additional mode of transportation.

Mode	Need? Yes/No	Nearby Generator?		Existing Facilities?		Volume	
		Yes/No	Type	Yes/No	Type	#	Unit
PED/BIKE							
OSOW							

Other Information: Identify any concerns or limitations the additional modes of transportation have.

Summary Table:

Please fill out the following table (delete any unused alternative rows).

Alternative and Traffic Control Type[1]	Geometric Changes	Construction Cost	Real Estate			Environmental	
			Bldgs.	Acre	Cost	Type	Acre
Enter Existing Conditions							
Enter Alternative 1 Conditions							
Enter Alternative 2 Conditions							
Enter Alternative 3 Conditions							
Enter Alternative 4 Conditions							
Enter Alternative 5 Conditions							
Enter Alternative 6 Conditions							
Enter Alternative 7 Conditions							

Recommendation:

Recommended Alternative:
Concerns or Considerations:

[1] If the project is an interchange, please list each intersection separately. Ex: Alt. 1, Int. 1: Traffic Signal & Alt. 1, Int. 2: RAB – Single Lane

Enter Existing Conditions and Enter Alternative 1 Conditions:

Practical Feasibility:

Enter Existing Conditions:

Public Opinion:	
Business Impacts:	
ROW Impacts:	
Utility Impacts:	
Cost Estimate:	
Additional Info:	

Enter Alternative 1 Conditions:

Public Opinion:	
Business Impacts:	
ROW Impacts:	
Utility Impacts:	
Cost Estimate:	
Additional Info:	

Operational Analysis:

Enter Existing Conditions:

Warrant Analysis:	
Queue Impacts:	
Additional Capacity:	
Railroad or Lift Bridge Influence:	
Additional Info:	

Enter Alternative 1 Conditions:

Warrant Analysis:	
Queue Impacts:	
Additional Capacity:	
Railroad or Lift Bridge Influence:	
Additional Info:	

Operational Analysis:

Enter Existing Conditions:

Year:												
AM Peak	SB			WB			NB			EB		
	-	-	-	-	-	-	-	-	-	-	-	-
# Lanes												
LOS												
Delay (s)												
v/c												
Queue (ft.)												
Storage (ft.)												
Int. LOS												
PM Peak	SB			WB			NB			EB		
	-	-	-	-	-	-	-	-	-	-	-	-
# Lanes												
LOS												
Delay (s)												
v/c												
Queue (ft.)												
Storage (ft.)												
Int. LOS												

Additional Information:

Enter Alternative 1 Conditions:

Year:												
AM Peak	SB			WB			NB			EB		
	-	-	-	-	-	-	-	-	-	-	-	-
# Lanes												
LOS												
Delay (s)												
v/c												
Queue (ft.)												
Storage (ft.)												
Int. LOS												
PM Peak	SB			WB			NB			EB		
	-	-	-	-	-	-	-	-	-	-	-	-
# Lanes												
LOS												
Delay (s)												
v/c												
Queue (ft.)												
Storage (ft.)												
Int. LOS												

Additional Information:

Operational Analysis:

Enter Existing Conditions:

Year:												
AM Peak	SB			WB			NB			EB		
	-	-	-	-	-	-	-	-	-	-	-	-
# Lanes												
LOS												
Delay (s)												
v/c												
Queue (ft.)												
Storage (ft.)												
Int. LOS												
PM Peak	SB			WB			NB			EB		
	-	-	-	-	-	-	-	-	-	-	-	-
# Lanes												
LOS												
Delay (s)												
v/c												
Queue (ft.)												
Storage (ft.)												
Int. LOS												

Additional Information:

Enter Alternative 1 Conditions:

Year:												
AM Peak	SB			WB			NB			EB		
	-	-	-	-	-	-	-	-	-	-	-	-
# Lanes												
LOS												
Delay (s)												
v/c												
Queue (ft.)												
Storage (ft.)												
Int. LOS												
PM Peak	SB			WB			NB			EB		
	-	-	-	-	-	-	-	-	-	-	-	-
# Lanes												
LOS												
Delay (s)												
v/c												
Queue (ft.)												
Storage (ft.)												
Int. LOS												

Additional Information:

Safety:

Enter Existing Conditions:

CMF Name:
CMF Source:
CMF Justification[2]:
Additional Info[3]:

CMF by Crash Type		CMF by Severity					Totals:		
Crash Type		Severity					Historic	Targeted	CMF Adjusted
		K	A	B	C	PD			
Right Angle							0	0	0.0
Left Turn							0	0	0.0
Rear End							0	0	0.0
Sideswipe - Opposite							0	0	0.0
Sideswipe - Same							0	0	0.0
Merging							0	0	0.0
Head On							0	0	0.0
Hit Object							0	0	0.0
Run Off Road							0	0	0.0
Pedestrian/Bicycle							0	0	0.0
Overturn							0	0	0.0
TOTALS:	Historic Data	0	0	0	0	0	0	0	0.0
	Targeted Crashes	0	0	0	0	0	0	0.0	
	CMF Adjusted	0.0	0.0	0.0	0.0	0.0	0.0		

Safety Information:

Enter Alternative 1 Conditions:

CMF Name:
CMF Source:
CMF Justification:
Additional Info:

CMF by Crash Type		CMF by Severity					Totals:		
Crash Type		Severity					Historic	Targeted	CMF Adjusted
		K	A	B	C	PD			
Right Angle							0	0	0.0
Left Turn							0	0	0.0
Rear End							0	0	0.0
Sideswipe - Opposite							0	0	0.0
Sideswipe - Same							0	0	0.0
Merging							0	0	0.0
Head On							0	0	0.0
Hit Object							0	0	0.0
Run Off Road							0	0	0.0
Pedestrian/Bicycle							0	0	0.0
Overturn							0	0	0.0
TOTALS:	Historic Data	0	0	0	0	0	0	0	0.0
	Targeted Crashes	0	0	0	0	0	0	0.0	
	CMF Adjusted	0.0	0.0	0.0	0.0	0.0	0.0		

Safety Information:

[2] Justification is needed for any CMF not listed in the WisDOT CMF Table
[3]To update, click on filename here: (FILENAME) and press F9

ICE Submittal Checklist

(Form available on Traffic Operation Manual website under Intersection Control Evaluations (ICE) at http://wisconsindot.gov/Pages/doing-bus/local-gov/traffic-ops/manuals-and-standards/manuals.aspx)

ICE SUBMITTAL CHECKLIST						
Level of ICE (Check Applicable Box): ☐ Phase I: Scoping ICE ☐ Phase II: Alternative Selection ICE						
Documentation	Submittal Requirements		Submittal to Region		Submittal to BTO	
	Phase I ICE	Phase II ICE	Included	N/A	Included	N/A
Report						
▪ Phase I: ICE Memorandum	Required	N/A	☐	☐	☐	☐
Project Description						
▪ Project Location Map	Required	Required	☐	☐	☐	☐
▪ Aerial Photo of Intersection	Optional	Optional	☐	☐	☐	☐
Description of Alternatives Considered						
▪ Phase I: ICE Brainstorming Guide	Optional [a]	N/A	☐	☐	☐	☐
▪ Phase II: ICE Worksheet	N/A	Required	☐	☐	☐	☐
Traffic Volume Data						
▪ Turning Movement Counts (field count data)	Optional	Required	☐	☐	☐	☐
▪ Segment Traffic Forecasts	Optional	Required	☐	☐	☐	☐
▪ Intersection Traffic Forecasts	Optional	Required	☐	☐	☐	☐
Safety Considerations						
▪ Crash Diagrams with summary of crashes per year and crash rates	Optional	Required	☐	☐	☐	☐
Additional Modes of Transportation						
▪ Wisconsin Bike Map (bike rating)	Optional	Optional	☐	☐	☐	☐
▪ 5-Year Summary of OSOW and Long Truck Routes	Optional	Optional	☐	☐	☐	☐
Operational Analysis (as applicable)						
▪ AWSC Warrants	Optional	Required	☐	☐	☐	☐
▪ Traffic Signal Warrants	Optional	Required	☐	☐	☐	☐
▪ Electronic Files for HCS, Sidra, & Synchro	Optional	Required	☐	☐	Not Applicable	

ICE SUBMITTAL CHECKLIST						
Level of ICE (Check Applicable Box): ☐ **Phase I: Scoping ICE** ☐ **Phase II: Alternative Selection ICE**						
Documentation	**Submittal Requirements**		**Submittal to Region**		**Submittal to BTO**	
	Phase I ICE	**Phase II ICE**	**Included**	**N/A**	**Included**	**N/A**
▪ HCS Worksheets						
~ *HCS 2010 Formatted Summary Report (AWSC, TWSC, Roundabouts)*	Optional	Required	☐	☐	☐	☐
~ *HCS 2010 Full Formatted Report (Signals)*	Optional	Required	☐	☐	☐	☐
▪ Sidra Worksheets (Roundabouts only)						
~ *Site Layout*	Optional	Required	☐	☐	☐	☐
~ *Input Volumes*	Optional	Required	☐	☐	☐	☐
~ *Input Comparison ("with Standard Model Defaults")*	Optional	Required	☐	☐	☐	☐
~ *Movement Summary (HCM 2010)*	Optional	Required	☐	☐	☐	☐
~ *Lane Summary (HCM 2010)*	Optional	Required	☐	☐	☐	☐
▪ Synchro Worksheets						
~ *Signalized Intersection Report (with following data: Lane Inputs, Volume Inputs, Timing Inputs, Actuated Inputs, Queues)*	Optional	Required	☐	☐	☐	☐
~ *HCM 2010 Signalized "Summary" report (with 95th percentile queue)*	Optional	Required	☐	☐	☐	☐
~ *Unsignalized Intersection Report (with following data: Lane Inputs, Volume Inputs)*	Optional	Required	☐	☐	☐	☐
~ *HCM 2010 AWSC or TWSC*	Optional	Required	☐	☐	☐	☐
▪ SimTraffic Outputs for each run	Optional	Required	☐	☐	☐	☐
Traffic Model Peer Review (as applicable)						
▪ DT 1887 for all HCM-based Analyses	Optional	Required	Not Applicable		☐	☐
▪ DT 2291 for Microsimulation Analyses (specifically SimTraffic) [b]	Optional	Required	Not Applicable		☐	☐
Region Comments						
▪ Region Comments on Phase I: ICE	Optional	Optional	Not Applicable		☐	☐
Other Reference Material (as applicable)						
▪ TIA (relevant pages)	Optional	Optional	☐	☐	☐	☐

(a) Completion of the Phase I: ICE Brainstorming Guide is optional, but highly recommended. If this guide is completed, the region shall submit it to BTO for review along with the Phase I: ICE memorandum.

(b) Submit all Paramics or Vissim models to BTO for review as a separate process outside of the ICE process. BTO does not generally review the SimTraffic analyses, thus the DT 2291 form for SimTraffic models should be submitted along with the ICE report to ensure that all SimTraffic analyses referenced in the ICE report has gone through the Traffic Model Peer Review Process