Revise and Resubmit. HQ Traffic is willing to do a CRM if Designer believes its needed.

missing information

MassDOT ICE Stage 2: Control Strategy Assessment

Project Name	Medfield - West Street & North Meadows Road		Project File No.	612807	10013	Date	11/26/24
MassDOT District	3	City/Town	Medfield		Latitude	42.192282	
Major Street	North Meadows Road (Route 27)	Minor Street	West Street		Longitude	-71.323942	
Submitted By		Agency/Company	BETA Group, Inc.		Email		
					Link to intersection location		

List all intersection control strategies identified in Stage 1

	Was a fatal flaw identified after Stage 1?
Traffic Signal	No
Roundabout	No
Other*	

* if Other was identified on the Stage 1 Form, provide a name in the green input box. Otherwise, leave blank.

Typical fatal flaws identified after completing the ICE Stage 1 form include but are not limited to control strategies that do not meet MUTCD Warrants, right-of-way impacts with Article 97 implications, and/or municipal opposition to improvements located within municipal roadway layouts.

If a fatal flaw was identified after Stage 1, please describe it in the Justification box of the Control Strategy Evaluation section at the end of this form.

Existing Major Street Information	
Existing Control Type	Signal
Study Period #1 Traffic Volumes	Study Period #2 Traffic Volumes
Weekday AM Peak	Weekday PM Peak

Operational Analyses

Opening Year: 2031

Control Strategy	Weekday AM Peak		Weekday PM Peak	
	Delay (sec.)	All queues accommodated?	Delay (sec.)	All queues accommodated?
Traffic Signal	46.7	Both West St queues extend past business drives	40.1	West St WB approach queue extends past business drives &
Roundabout	16.6	West St EB queue extends past business drives	19.5	West St WB queue extends past Peter Kristof Way

Design Year: 2044

Control Strategy	Weekday AM Peak		Weekday PM Peak	
	Delay (sec.)	All queues accommodated?	Delay (sec.)	All queues accommodated?
Traffic Signal	63.5	Both West St queues extend past drives & side streets	53.9	West St W approach queue extends past business drives &
Roundabout	34.7	EB and NB queues extend past business drives	45.0	SB and WB queues extend past business drives

Provide any additional discussion necessary regarding the results of the operational analysis: Roundabout analysis was done using the GDOT spreadsheet. Delay for roundabout was determined by averaging the approach delays.

Safety Performance

Summarize the available crash data. Five (5) years preferred, three (3) years minimum.

Crash Severity	Year					Total
	2017	2018	2019	2020		
PDO	5	5	5	1	3	19
Injury	2	2	0	0	3	7
Fatal	0	0	0	0	0	0
Total	7	7	5	1	6	26

Apply the MassDOT Safety Alternatives Analysis Guide to model to model anticipated safety performance of each control strategy and qualitatively discuss its impact.

Control Strategy	Anticipated Impact on Safety Performance	Opening Year		Design Year	
		Total PDO Crashes	Total Fatal+Injury Crashes	Total PDO Crashes	Total Fatal+Injury Crashes
Traffic Signal	Install Left Turn Lanes (CMF = 0.656), Shared Use Path (CMF = 0.75)	2.74	1.02	3.00	1.14
Roundabout	Turbo Roundabout (CMF = 0.239), Shared Use Path (CMF = 0.75)	1.00	0.37	1.09	0.41

Costs

Provide the combined conceptual level capital costs for each control strategy and note the elements it includes: engineering (PE), right-of-way (ROW), construction, and/or contingency. Report the Net Present Value (NPV) of costs from the MassDOT ICE Tool Output tab, Analysis Summary section for the following cost categories: Operating & Maintenance, Auto Passenger plus Truck Delay, and Safety. Report the total NPV cost of all combined categories. Do not report the NPV of Improvements from the Benefit-Cost (B/C) comparison section.

Control Strategy	Capital Costs	Capital Estimate Includes	Operating & Maintenance	Auto & Truck Delay	Safety	Total NPV cost
Traffic Signal	$2,580,000	PE & Construction	$309,154	$27,891,667	$6,032,917	$36,813,738
Roundabout	$3,870,000	PE & Construction	$210,004	$14,267,342	$2,181,180	$20,528,525

Existing Multimodal Accommodations

Route # or Name:	North Meadows Road (Route 27)		Route # or Name:	West Street		Route # or Name:	N/A	
Direction	NB	SB	Direction	EB	WB	Direction	N/A	N/A
Sidewalks along	No	No	Sidewalks along	No	No	Sidewalks along	N/A	N/A
Crosswalk on Approach?	No	No	Crosswalk on Approach?	No	No	Crosswalk on Approach?	N/A	N/A
On-Street Bike Facilities?	No	No	On-Street Bike Facilities?	No	No	On-Street Bike Facilities?	N/A	N/A
Multi-Use Path?	No	No	Multi-Use Path?	No	No	Multi-Use Path?	N/A	N/A
Schedule Bus Service?	No	No	Schedule Bus Service?	No	No	Schedule Bus Service?	N/A	N/A
Bus Stop on Approach?	No	No	Bus Stop on Approach?	No	No	Bus Stop on Approach?	N/A	N/A

Note the existing level of pedestrian/bicyclist activity at the study intersection during the evaluated peak hours.	Weekday AM Peak		Weekday PM Peak	
	Major Street	Minor Street	Major Street	Minor Street
# of ped. crossings (both approaches, if app.):	1	0	1	0
# of cyclists (both approaches, if app.):	0	0	0	4

Summarize the ability of each viable control strategy to accommodate the existing/anticipated level of:

Control Strategy	Pedestrians and Bicyclists	Transit Services	Freight Needs
Traffic Signal	Concept includes crosswalks on every intersection approach and a shared use path on all legs approaching the roundabout .	None currently within project area	Footprint of proposed concept nearly matches existing conditions (and therefore existing freight needs)
Roundabout	Concept includes sidewalks and crosswalks at every intersection approach and a shared use path on all legs approaching the roundabout. RRFB on two lane approaches.	None currently within project area	WB-67 design vehicle used for roundabout concept (all movements)

Environmental, Utility, and Right-of-Way Impacts

Summarize any issues related to environmental, utility, or right-of-way (including relocation) impacts specific to each control strategy:

Traffic Signal	Similar footprint to existing intersection, a total of approximately 860 SF of temporary easements on all quadrants and 7,600 SF of permanent easements which would impact all quadrants. Additional permanent easements would be needed along the south side of West St for utility pole relocations.
Roundabout	Approx. 11,200 SF of temp. easements on all quadrants, 9,400 SF of perm easements. Would significantly reduce potential for on-site stormwater improvements. 70 ft retaining wall on SW quadrant.
	In addition, the ROW impacts related to the design, additional perm easements would be required to accommodate the UP relocations needed along the south side of West Street and east side of North Meadows Road (Route 27).

Public Input/Feedback

Summarize public input received or any stakeholder considerations regarding the control strategies.

N/A

Control Strategy Evaluation

Use the justification text box to describe for each control strategy how the benefits and drawbacks align with the purpose and need of the project. The justification to promote the control strategy or to remove it from further consideration should consider the total NPV cost, the benefits, and the drawbacks. Describe any fatal flaws that were identified after the ICE Stage 1.

Control Strategy	What are the main benefits?	What are the main drawbacks?	Justification
Traffic Signal	☐ Operations ☐ Cost ☐ Safety Performance ✓ Bicycle/Ped Accom. ☐ Transit Services ☐ Environmental ✓ Right-of-Way ☐ Public Input ☐ None	✓ Operations ✓ Cost ☐ Safety Performance ☐ Bicycle/Ped Accom. ☐ Transit Services ☐ Environmental ☐ Right-of-Way ☐ Public Input ☐ None	This alternative provides bicycle and pedestrian accommodations and intersection improvements while maintaining more of a similar footprint to that of the existing configuration, thus resulting in just under 2,000 SF less permanent ROW impacts than the roundabout alternative. The additive CMFs of adding dedicated left-turning lanes and a shared use path does not provide as significant safety improvements as the implementation of the turbo roundabout alternative but still would improve safety at the intersection. This all results in higher NPV costs than the alternative of a turbo roundabout. The cost of permanent takings is unknown at this time and was not factored into the NPV. Construction cost is less than the roundabout option.
Roundabout	✓ Operations ✓ Cost ✓ Safety Performance ✓ Bicycle/Ped Accom. ☐ Transit Services ☐ Environmental ☐ Right-of-Way ☐ Public Input ☐ None	☐ Operations ☐ Cost ☐ Safety Performance ☐ Bicycle/Ped Accom. ☐ Transit Services ☐ Environmental ✓ Right-of-Way ☐ Public Input ☐ None	This alternative provides bicycle and pedestrian accommodations, and the CMF for a turbo roundabout provides significant safety improvements to the intersection. The ROW acquisition needed to construct this roundabout alternative is over 2,000 SF greater than the traffic signal alternative. These safety improvements combined with there being less post-construction operation costs associated with the roundabout results in the overall NPV cost of the roundabout alternative being significantly less than the traffic signal alternative. Construction cost is higher than the traffic signal option. Again, this option would result in just under 2,000 SF in additional permanent takings when compared to the traffic signal option but that cost value is unknown at this time and was not factored into the NPV.
	☐ Operations ☐ Cost ☐ Safety Performance ☐ Bicycle/Ped Accom. ☐ Transit Services ☐ Environmental ☐ Right-of-Way ☐ Public Input ☐ None	☐ Operations ☐ Cost ☐ Safety Performance ☐ Bicycle/Ped Accom. ☐ Transit Services ☐ Environmental ☐ Right-of-Way ☐ Public Input ☐ None	.
	☐ Operations ☐ Cost ☐ Safety Performance ☐ Bicycle/Ped Accom. ☐ Transit Services ☐ Environmental ☐ Right-of-Way ☐ Public Input ☐ None	☐ Operations ☐ Cost ☐ Safety Performance ☐ Bicycle/Ped Accom. ☐ Transit Services ☐ Environmental ☐ Right-of-Way ☐ Public Input ☐ None	
	☐ Operations ☐ Cost ☐ Safety Performance ☐ Bicycle/Ped Accom. ☐ Transit Services ☐ Environmental ☐ Right-of-Way ☐ Public Input ☐ None	☐ Operations ☐ Cost ☐ Safety Performance ☐ Bicycle/Ped Accom. ☐ Transit Services ☐ Environmental ☐ Right-of-Way ☐ Public Input ☐ None	
	☐ Operations ☐ Cost ☐ Safety Performance ☐ Bicycle/Ped Accom. ☐ Transit Services ☐ Environmental ☐ Right-of-Way ☐ Public Input ☐ None	☐ Operations ☐ Cost ☐ Safety Performance ☐ Bicycle/Ped Accom. ☐ Transit Services ☐ Environmental ☐ Right-of-Way ☐ Public Input ☐ None	

Is a single control strategy clearly preferred?		If yes, the ICE procedure is complete. Select which control strategy is preferred.	

If a single control strategy is **not** clearly preferred, narrow the list of alternatives and continue to Stage 3.

Select which Control Strategies will advance into Stage 3

Reserved for MassDOT Comments

This section needs to be completed. As submitted, there is no conclusion, so we do not know which alternative the designer is recommending to advance or if Stage 3 is being recommended.