

Screening Matrix Guidance

Previously, the I-84 PEL Study project team presented information on conducting Fatal Flaw Analysis and Redundancy Analyses for the Concepts under consideration. This was followed by presentation of the Screening Matrix Analysis (SMA) for the Mainline Segment. In preparation for the following PAC meeting, we are providing the SMA for the East, Center, and West segments. Please carefully review the screening matrices in the attached package in preparation for discussion.

The left column presents a list of Considerations (factors that should be considered in the decision process when comparing one Concept to another with regards to meeting the PEL purpose and the level of interruption and impact to the built and natural environment). These Considerations have been broken down first into Engineering Considerations and Environmental Considerations, and then further into “Key” and “Additional” Considerations. “Key” Considerations are critical to the screening process and for decision-making, additionally they are more integral in meeting the PEL purpose and improving conditions in the PEL Study Area. “Additional” Considerations are less critical to this process; however, play a role in determining whether specific Concepts should move forward in the next screening step.

We would also like you to direct attention to the right-hand column, where there are green, yellow, and red dots assigned to each of the rating criteria for each Consideration.

General Notes:

- Most rating criteria are qualifiers, rather than quantifiers, for the following reasons:
 - As this is a PEL Study, only a preliminary layout has been completed for each of the Concepts being analyzed.
 - Without a project-level design, the location of Concept features can not be precisely located, nor can travel time be accurately modeled and estimated.
- Not all criteria may be applicable to any one segment or to any one Concept.
 - Example: Left-hand ramps may not be present in a specific Concept so addressing these ramp configurations may not apply to any Concept in this Segment.
- At this level of preliminary Concept layout, travel times improvements could only be modeled for Mainline Concepts.
 - East, Center and West Segment Concepts can only be assessed more generally as to the level of impact on current travel times (improves, worsens, or remains approximately the same), using data generated from the full Mainline model.
- Rating criteria that have a simple Yes or No response where:
 - Yes is presented as the green dot, and No is the red dot.
 - Yes (green) means it improves the Consideration in the Study Area.
 - No (red) meaning it worsens the Consideration or does not address a Consideration that the public or the Study team has deemed important to the community.
 - Yes is presented as the green dot and No is the yellow dot.
 - Yes (green) means it improves a situation in the Study Area.
 - No (yellow) means no change in the Consideration.
 - Yes can also be presented as the red dot and No as the green dot, as in the case for some Environmental Considerations.

Screening Matrix Guidance (continued)

- Yes (red) means there are impacts likely to a particular resource.
- No or None (green) means no impacts are anticipated to that environmental resource.
- The middle (yellow) criterion indicates a potential for a negative impact, which means it appears that an impact to a resource is possible but at this level of planning, it cannot be determined with any certainty.
- Please also remember that with a preliminary layout of Concepts, no mitigation was applied to any feature of the layout; no potential mitigation measures were incorporated into any Concept. Examples:
 - No retaining walls were considered to reduce the footprint of slopes
 - There was no “tightening” of design features to avoid or reduce impacts to a resource
 - The Concept layout was not shifted one way or another to avoid or reduce impacts to a priority resource.
- Full- and Partial Property Takes were only estimated
 - A Partial Take may only be 1” inside the subject property boundaries
 - A Partial Take may be within 1” of being considered as a Full-Take
 - Since the severity of the Partial Takes could not be identified, they were therefore placed in the “Additional Considerations” for the Built Environment.

Please note any points of clarification you would like to discuss during the next PAC meeting.

Thank you for taking the time to review these three SMA tables, the PAC interaction continues to be valued and vital to the I-84 PEL Study planning process.

Mainline Segment

Engineering Considerations	Concept 1		Concept 9		Concept 22		<div><div></div><div></div><div></div></div> <div>Rating Criteria</div>		
	Add Lane		Rt 7 Express Median		I-84 Express Median				
	metric	rating	metric	rating	metric	rating			
Key Engineering Considerations									
Congestion and Mobility									
I-84 (PM) reduction in travel time (minutes)							≥ 50*	10-49	< 10**
Rt. 7 (AM) reduction in travel time (minutes)							≥ 40*	8-39	< 8**
Rt. 7 (PM) reduction in travel time (minutes)							≥ 55*	11-54	< 11**
Corrections of weaving							Completely	Partially	None
Additional Engineering Considerations									
Schedule and Budget									
Construction Complexity and Staging							Low	Medium	High
Construction cost (billions)							≤\$1 B	>\$1-2 B	>\$2 B

*compared to no-build












**20% of no-build

Other Factors Considered
<i>Engineering Considerations with NO differentiators</i>
● I-84 (AM) reduction in travel time (minutes)
● Addresses left-hand ramps on I-84 (Yes)
● Addresses lane continuity on I-84 (Yes)
NA Able to meet Ramp Design Standards (NA)
NA Number of changes to local movements (NA)
● Consistent design speed (Yes, I-84 curve - Intchg 3, eastbound)
● Consistent design speed (Yes, I-84 curve - Intchg 7, westbound)
NA Scope of improvements to local network (NA)
NA Improves connection to Danbury Hospital (NA)
NA Improves connection to downtown (NA)
NA Addresses pedestrian, bicycle, and transit for local streets (NA)
● Vertical geometry improvements (Yes)
NA Horizontal curve and sight distance (NA)
NA Meets driver expectancy (NA)
● Acceleration/deceleration lane lengths improved at all interchanges (Yes)
● Stopping sight distance improved (Yes, Intchg 3 (eastbound) & Intchg 7 (westbound))
● Maintain I-84 traffic during construction (Yes)

Environmental Considerations	Concept 1		Concept 9		Concept 22		<div><div></div><div></div><div></div></div> <div>Rating Criteria</div>		
	Add Lane		Rt 7 Express Median		I-84 Express Median				
	metric	rating	metric	rating	metric	rating			
Key Environmental Considerations									
Built Considerations									
Full property takes (numbers)							<15	15-25	>25
EJ and sensitive neighborhood impacts							None/Minimal	Moderate	Strong
Natural Considerations - No Differentialtors									
Additional Environmental Considerations									
Built Considerations									
Partial property takes (numbers)							<40	40-80	>80
Community facility impacts							None	Potential	Yes
Natural Considerations - No Differentialtors									


Other Factors Considered
<i>Environmental Considerations with NO differentiators</i>
● Dead-end streets-community cohesion (No)
● Cemetary property impacts (Yes)
● Wetland impacts (IP)
● Stream impacts (Permit)
● Potential for floodplain impacts (Some)
● Listed species impacts: northern long-eared bat (None)
● Listed species impacts: bog turtle (None)
● Section 4(f) property impacts (None)
● Historic property impacts (None)
● Detailed noise analysis (Yes)
● Visual/aesthetic impacts (Yes)
● Impact to NGPL (Potential)
● Critical environmental area impacts (None)
● Impacts to habitat for state-listed plant species (Within)

East Segment

Engineering Considerations	Concept 14		Concept 15		Rating Criteria		
	CD Road Eastbound		CD Road				
	metric	rating	metric	rating			
Key Engineering Considerations							
Congestion and Mobility							
I-84 (PM) reduction in travel time (minutes)*					Better	Neutral	Worse
Corrections of weaving					Completely	Partially	None
Additional Engineering Considerations							
Distance between adjacent ramp					Exceeds requirement	Meets requirement	Fails to meet requirement
Number of changes to local movements (I-84 and Route 7)					0	1-2	>2
Geometry - No Differentiators							
Schedule and Budget - No Differentiators							








































*compared to no-build, adjusted for segment length

Other Factors Considered
<i>Engineering Considerations with NO differentiators</i>
<ul style="list-style-type: none"> I-84 (AM) reduction in travel time (Better) Rt. 7 (AM) reduction in travel time (Better) Rt. 7 (PM) reduction in travel time (Neutral) Addresses lane continuity on I-84 (Yes) Addresses left-hand ramps on I-84 (Yes) Able to meet Ramp Design Standards (Yes) Exit 6 remains a partial interchange (Yes) Consistent design speed within segment (No) Scope of improvements on local network (Medium) Improve connection to Danbury Hospital (No) Improve connection to downtown (No) Addresses pedestrian, bicycle, and transit for local streets (Partially) Vertical geometry improvements (Yes) Horizontal curve and sight distance (Improved, I-84 W at Intchg 7) Meets driver expectancy (Yes) Construction complexity and staging (Low) Maintains I-84 traffic during construction (Yes) Construction cost (Low)

Environmental Considerations	Concept 14		Concept 15		Rating Criteria		
	CD Road Eastbound		CD Road				
	metric	rating	metric	rating			
Key Environmental Considerations - No Differentiators							
Additional Environmental Considerations - No Differentiators							

Other Factors Considered
<i>Environmental Considerations with NO differentiators</i>
<ul style="list-style-type: none"> Full property takes (Minimal) Dead-end streets-community cohesion (No) Cemetery property impacts (None) EJ and sensitive neighborhood impacts (Moderate) Wetland impacts (IP) Stream impacts (Permit) Potential for floodplain impacts (Some) Listed species impacts: northern long-eared bat (None) Listed species impacts: bog turtle (None) Partial property takes (High) Section 4(f) impacts (None) Historic property impacts (None) Detailed noise analysis (Yes) Visual/aesthetic impacts (Potential) Impact to NGPL (Yes) Community facility impacts (None) Critical environmental area impacts (None) Impacts to habitat for state-listed plant species (Adjacent)

Center Segment

Engineering Considerations	Concept 3		Concept 13		Concept 16		Concept 26		Rating Criteria		
	Tamarack Ave		Great Plains Road		Interchange 6 - CD Road		Intchg 6 North St Full Access				
	metric	rating	metric	rating	metric	rating	metric	rating			
Key Engineering Considerations											
Congestion and Mobility											
Rt. 7 (AM) reduction in travel time (minutes)*									Better	Neutral	Worse
Rt. 7 (PM) reduction in travel time (minutes)*									Better	Neutral	Worse
I-84 (AM) reduction in travel time (minutes)*									Better	Neutral	Worse
Additional Engineering Considerations											
Maintains direct access to businesses on North Street									Full	Partial	None
Scope of improvements on local network									Low	Medium	High
Geometry											
Distance between adjacent ramps (miles)									Exceeds requirement	Meets requirement	Fails to meet requirement
Meets driver expectation (full interchange)									Yes	Partially	No
Schedule and Budget											
Construction Complexity and Staging									Low	Medium	High
Construction cost (Millions)									<\$100 M	\$100-300 M	>\$300 M

*compared to no-build, adjusted for segment length

Other Factors Considered
<i>Engineering Considerations with NO differentiators</i>
<ul style="list-style-type: none"> I-84 (PM) reduction in travel time (Neutral)* Addresses lane continuity on I-84 (Does not) Addresses left-hand ramps I-84 (Does not) Able to meet Ramp Design Standards (Yes) NA Corrections of weaving (NA) NA Number of changes to local movements (NA) NA Consistent design speed within segment (NA) Improves connection to Danbury Hospital (Yes) Improves connection to downtown (Yes) Addresses pedestrian, bicycle, and transit for local streets (Yes) NA Vertical geometry improvements (NA) NA Horizontal curve and sight distance (NA) Maintains I-84 Traffic during construction (Yes)

Environmental Considerations	Concept 3		Concept 13		Concept 16		Concept 26		<div><div></div><div></div><div></div></div> <div>Rating Criteria</div>		
	Tamarack Ave		Great Plains Road		Interchange 6 - CD Road		Intchg 6 North St Full Access				
	metric	rating	metric	rating	metric	rating	metric	rating			
Key Environmental Considerations											
Built Considerations											
Full property takes (numbers)									<10	10-24	≥25
Dead-end streets-community cohesion									No		Yes
Cemetery property impacts									No		Yes
EJ and sensitive neighborhood impacts									None/Minimal	Moderate	Strong
Natural Considerations											
Wetland impacts									Self-Verify	PCN*	IP**
Potential for floodplain impacts									None/Minimal	Some	Not Permissible
Additional Environmental Considerations											
Built Considerations											
Partial property takes (numbers)									<20	20-49	≥50
Section 4(f) property impacts									None	Potential	Yes
Visual/aesthetic impacts									None	Potential	Yes
Impact to NGPL									None	Potential	Yes
Community facility impacts									None	Potential	Yes
Natural Considerations											
Impacts to habitat for state-listed plant species									None	Adjacent	Within

* Pre-Construction Notification

** Individual or General Permit

Other Factors Considered
<i>Environmental Considerations with NO differentiators</i>
<ul style="list-style-type: none"> Stream impacts (No permit) Listed species impacts: northern long-eared bat (None) Listed species impacts: bog turtle (None) Historic property impacts (None) Detailed noise analysis (Yes) Critical environmental area impacts (None)

West Segment

Engineering Considerations	Concept 6 Interchanges 3 & 4 - Segar St Ramp		Concept 12 Interchanges 3 & 4 - CD Road		Rating Criteria		
	metric	rating	metric	rating			
<i>Key Engineering Considerations</i>							
<i>Congestion and Mobility</i>							
Corrections of weaving					Completely	Partially	None
<i>Additional Engineering Considerations</i>							
<i>Congestion and Mobility</i>							
Number of changes to local movements (only Interchange 4)					0	1-2	>2

Other Factors Considered
<i>Engineering Considerations with NO differentiators</i>
NA I-84 (AM) reduction in travel time (NA)
I-84 (PM) reduction in travel time (Better)
NA Rt. 7 (AM) reduction in travel time (NA)
Rt. 7 (PM) reduction in travel time (Better)
Addresses lane continuity on I-84 (No)
Addresses left-hand ramps on I-84 (No)
Able to meet Ramp Design Standards (Yes)
Improvements to Interchange 4 (Positive)
Consistent design speed within segment (No)
Scope of improvements on local network (Low)
Improves connection to downtown (No)
Improves connection to Danbury Hospital (No)
Addresses pedestrian, bicycle, and transit for local streets (Partially)
NA Distance between adjacent ramps (NA)
Vertical geometry improvements (Yes)
NA Horizontal curve and sight distance (NA)
Meets driver expectancy (Partially, Intchg 6)
Construction complexity and staging (Low)
Maintains I-84 traffic during construction (Yes)
Construction costs (Low)

Environmental Considerations	Concept 6 Interchanges 3 & 4 - Segar St Ramp		Concept 12 Interchanges 3 & 4 - CD Road		Rating Criteria		
	metric	rating	metric	rating			
<i>Key Environmental Considerations</i>							
<i>Built Considerations - No differentiators</i>							
<i>Natural Considerations</i>							
Wetland Impacts					Self-Verify	PCN*	IP**
Stream impacts					No permit		Permit
<i>Additional Environmental Considerations</i>							
<i>Built Considerations</i>							
Community facility impacts					None	Potential	Yes
<i>Natural Considerations - No Differentiators</i>							

* Pre-Construction Notification

** Individual or General Permit

Other Factors Considered
<i>Environmental Considerations with NO differentiators</i>
Full property takes (Minimal)
Dead-end streets-community cohesion (No)
Cemetery property impacts (None)
EJ and sensitive neighborhood impacts (Minimal)
Potential for floodplain impacts (Minimal)
Listed species impacts: northern long-eared bat (None)
Listed species impacts: bog turtle (None)
Partial property takes (Minimal)
Section 4(f) property impacts (None)
Historic property impacts (None)
Detailed noise analysis (Yes)
Visual/aesthetic impacts (None)
Impact to NGPL (None)
Critical environmental area impacts (None)
Impacts to habitat for state-listed plant species (Adjacent)