What Is This Study About?

The Connecticut Department of Transportation (CTDOT) conducted an Alternatives Analysis (AA) for the future of the aging Hartford rail viaduct. The viaduct is an elevated track structure adjacent to Hartford's historic Union Station that serves both Amtrak intercity passenger trains and freight trains. This AA developed and evaluated options to maintain, reconstruct, or relocate the rail corridor in this area (track and station). The study results will help guide the local decision-making process toward selection of a locally preferred alternative to address the stated need.

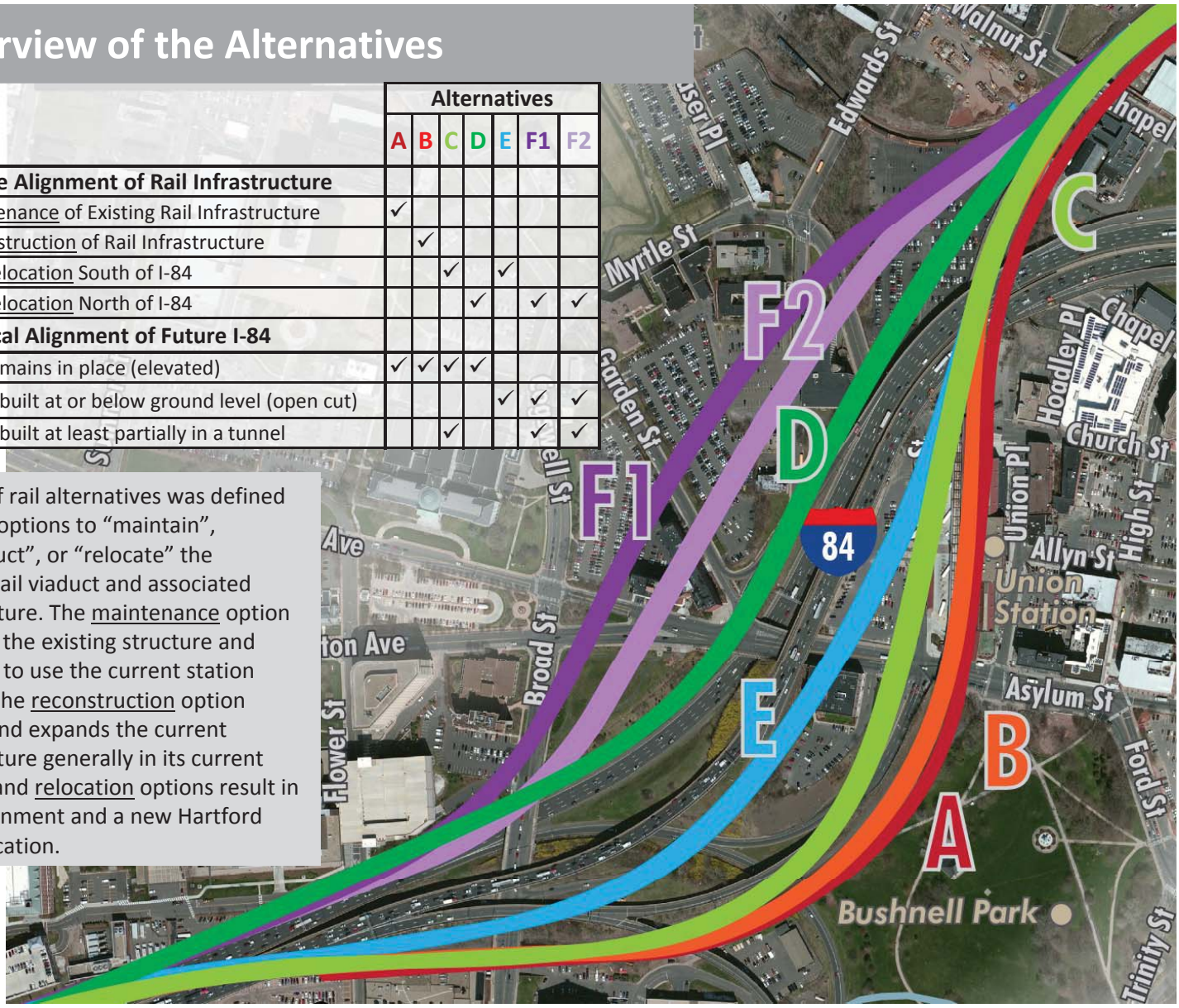
Why Is This Project Needed?

The purpose of this project is to address the ongoing **serviceability** of the aging rail viaduct infrastructure, increase regional rail **mobility**, improve local **connectivity**, and create a gateway that spurs **economic development**. These are wide-ranging themes that go beyond simply building a piece of transportation infrastructure to also address large community goals.

Overview of the Alternatives

		Alternatives						
		A	B	C	D	E	F1	F2
Key Characteristics	**Future Alignment of Rail Infrastructure**							
	Maintenance of Existing Rail Infrastructure	✓						
	Reconstruction of Rail Infrastructure		✓					
	Rail Relocation South of I-84			✓		✓		
	Rail Relocation North of I-84				✓		✓	✓
	Vertical Alignment of Future I-84							
	I-84 remains in place (elevated)	✓	✓	✓	✓			
	I-84 rebuilt at or below ground level (open cut)					✓	✓	✓
	I-84 rebuilt at least partially in a tunnel			✓			✓	✓

A series of rail alternatives was defined based on options to "maintain", "reconstruct", or "relocate" the Hartford rail viaduct and associated infrastructure. The maintenance option preserves the existing structure and continues to use the current station location; the reconstruction option rebuilds and expands the current infrastructure generally in its current location, and relocation options result in a new alignment and a new Hartford station location.



Primary Conclusions

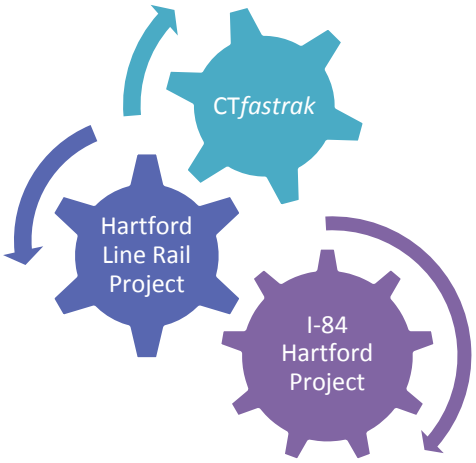
Alternative	Benefits (Opportunities) LOW — MEDIUM — HIGH	Costs (Impacts) LOW — MEDIUM — HIGH	Conclusions
A			Alternative A does not achieve the project goals to increase mobility, improve connectivity, or spur economic development. Although the financial cost is comparatively low, completing the work at the station while maintaining active rail operations would be extremely challenging.
B			Alternative B introduces operational benefits from the provision of two tracks, as well as additional parking capacity. However, it does little to enhance urban design, and although this option is relatively inexpensive, it potentially impacts Bushnell Park.
C			Alternative C offers modest additional benefits as compared to Alternative B, primarily because of the much easier station construction. However, the capital cost is higher than that of Alternative B, and the potential impact to Bushnell Park is a significant concern.
D			Alternative D offers the most benefits to the multimodal transportation program and TOD capacity when compared to Alternatives A-C (i.e. those that assume I-84 remains in its current location). The capital cost is projected to be less than that of Alternative C, and the potential adverse environmental impacts are not as severe.
E			Alternative E provides significant urban design benefits, but the cost is much higher than that of any other option. In addition, Alternative E is impossible to construct while maintaining continuous and active rail service.
F1			Alternative F1 generates the most vehicular connectivity-related benefits, and also fares well in enhancing urban design. The capital costs, while higher than most options, are half of that of Alternative E. However, there are notable potential property impacts.
F2			Alternative F2 offers significant benefits like Alternative F1, but is distinguished through the development of an optimal station area plan enhancing urban design and local connectivity. The capital cost is lower than that of Alternative F1 and is in the middle of all options. There are slightly more potential property impacts, but constructability fares better than Alternative F1.

- Alternatives **A** and **B** are relatively inexpensive from a capital cost perspective, but the construction impacts of maintaining service during station renovation are severe. From a constructability perspective, these alternatives would be more attractive with a full shutdown of rail services during the construction period.
- Very few benefits can be gained by moving the rail alignment closer to I-84 while remaining on the south side of the highway (Alternative **C**). This option would be somewhat more attractive with a modified track alignment to minimize impacts to Bushnell Park, but such a change would force the existing tight curvature in the station area to remain.
- Of the options that assume I-84 remains in its current location, Alternative **D** offers notable benefits with relatively modest potential adverse impacts. The capital costs compare favorably to reconstruction in place.
- Alternative **E** is effectively fatally flawed if active rail service must be maintained during construction. Even if service could be shut down for an extended period during construction, the cost is much higher than that of other options.
- Alternatives **F1** and **F2** have very similar overall characteristics. Alternative **F1** does better in improving vehicular connectivity, whereas **F2** offers better urban design features and pedestrian improvements. Alternative **F1** is slightly more difficult to construct, whereas Alternative **F2** has slightly more potential adverse environmental impacts. Alternative **F2** requires less tunneling, contributing to its lower capital cost than Alternative **F1**.
- When viewed holistically in their current configurations, only Alternatives **D**, **F1**, and **F2** have perceived benefits greater than the costs. All of these are the options in which the rail line would be moved north of I-84, resulting in benefits such as 2-3 minutes of travel time savings and decreased track maintenance. However, all of these options have strong interactions with the I-84 mainline and interchanges, requiring a fully-integrated design effort for the highway and rail components of the overall corridor program.

Based on the results of this evaluation, and setting the stage for further coordination with the I-84 Hartford Project, the focus moving forward should be on options that relocate the rail alignment north of I-84.

Integration with I-84 Hartford Project

The alternatives for the Hartford Rail Alternatives Analysis must be closely coordinated with the I-84 Hartford Project, which is the parallel planning program to rebuild and possibly realign I-84 through the city of Hartford. Currently, the rail line crosses I-84 at two locations in close proximity to the existing station. Thus, any realignment of either the rail line or the highway necessarily impacts the other, and coordination and integration of the two projects is essential. Additionally, impacts on the CT*fastrak* alignment must also be considered.



As technical work has been advancing on both the highway and rail projects, it has become increasingly apparent that neither the highway nor the rail program can be "solved" without the other. These two projects require a single and integrated approach that yields the best possible results for these two high-priority and visionary projects.

It is impossible for this rail AA to develop a rail "answer" without a highway "answer", and the reverse is also true for the highway study. Therefore, the approach taken for the rail AA is to present a range of rail options that reflects the spectrum of possible highway solutions.

Clearly, some of the I-84 design options have a bigger impact on rail alternatives than others, and some I-84 design options render certain rail alternatives difficult if not impossible to implement. For example, reconstructing the existing rail alignment in place would be impossible with a ground level I-84, because the rail alignment would be at the same elevation as I-84 where they cross. The interaction between the mainline alignments is certainly the starting point for assessing overall compatibility; however, many other design attributes, such as rail station location and highway interchange locations and configurations, also must be considered to define the highway and rail elements in such a way that compatibility can be fully assessed.

Based on this assessment, none of the rail reconstruction or relocation options can be constructed in such a way to be fully completed and "out of the way" of the highway project without causing significant impacts to the highway as well as the local street network during the course of construction. Likewise, highway options, and associated local street changes, are unlikely to be constructable without significant impacts on the rail corridor. The projects must be coordinated in such a way to advance together while seeking to minimize the impacts on both facilities during construction.

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Next Steps

The findings and conclusions establish the case for focusing on a smaller set of options as the planning process moves forward. The focus of the next phase of study, including environmental review, should be on the options that relocate the rail alignment north of I-84. This subset of rail options should be more fully detailed as part of an integrated approach that also includes highway options being considered as part of the I-84 Hartford Project.

It is clear that all of the most likely alternatives for implementation of a rail project will have significant interaction with I-84, whether in its current alignment or in a potential relocated alignment through the study area. This situation provides the opportunity for CTDOT to create a true transportation solution, rather than a modal solution. Addressing this critical corridor in such a creative way is a forward-looking approach consistent with the principles of the recently-published Let's Go CT! statewide transportation plan – a "transformative strategy to provide the transportation foundation for the future of Connecticut's economy".

For this reason, the best opportunity to generate a holistic result that is in Connecticut's best interest is by creating a truly integrated NEPA process that combines both rail and highway modes to produce a single corridor answer, rather than separate rail and highway answers.