



RTD FasTracks Northwest Rail Project Technology Review

Pro/Con Comparison Diesel Multiple Unit (DMU) and Electric Multiple Unit (EMU)

EMU Electric Multiple Unit (EMU)

Pros

- Overall net benefit to regional air quality due to decrease in vehicle miles traveled and corresponding emissions reductions
- Less noise at lower speeds
- Less vibration
- Fewer air emissions generated from train within the corridor
- Less expensive to operate and maintain
- More initial public support to date

Cons

- Air emissions generated from continually shifting network of coal, gas or nuclear power plants
- Front Range vistas affected by required overhead electrical system
- No payback on initial investment within 30 years
- Reconstruction of at least 9 bridges to meet bridge height clearance requirements results in schedule delays and substantial traffic delays
- Cost to electrify corridor approximately \$4.3 million/mile
- Additional capital cost of \$405-\$565 million to satisfy BNSF requirements for overhead wire system

DMU Diesel Multiple Unit (DMU)

Pros

- Overall net benefit to regional air quality due to decrease in vehicle miles traveled and corresponding emissions reductions
- Less expensive up-front costs
- Lower life-cycle costs
- Less construction complexity
- Allows FasTracks to stay on budget and on schedule
- No visual impacts

Cons

- Higher noise levels at lower speeds (without mitigation)
- More vibration (without mitigation)
- More air emissions generated from train within the corridor
- Less Initial public support to date



Summary Table of Evaluation Criteria

Criteria	EMU	DMU
Noise	Fewer impacts than DMU	More impacts than EMU (without mitigation)
Vibration	Fewer impacts than DMU	More impacts than EMU (without mitigation)
Air Quality (Local)	Minimal local impacts	Minimal local impacts
Air Quality (Regional)	Net benefit/decrease in emissions	Net benefit/decrease in emissions
Visual Impacts	More impacts than DMU	Fewer impacts than EMU
Cost	Not affordable within FasTracks corridor budget	Affordable
Complexity	Extreme complexity related to bridge reconstructions	Simple to construct
Community Input	Strong support for EMU	Moderate support for DMU

Preliminary Project Team Recommendation

The Project Team recognizes that DMU would generate more noise and vibration impacts than EMU, and would generate minor localized air impacts. However, given the ability to implement effective mitigation measures, combined with the substantial up-front capital cost and the complexity of construction related to the required bridge replacements, the Project Team recommends initiating service in the Northwest Rail Corridor with DMU.

Conclusion

This analysis took into consideration a variety of factors – public input and comment, environmental and operational analysis, and cost. The most significant disparate factor between the two technologies is cost and affordability – electrification of this 41-mile corridor is not feasible within the constraints of the FasTracks budget.

As noted earlier, a majority of the comments the Project Team received favored EMU technology. As the Northwest Rail study continues, RTD will work to address specific concerns related to the impacts associated with DMU. These will include following all federal standards to mitigate for noise and vibration and meeting federal standards regulating diesel emissions. Additionally, the Project Team will explore the viability of utilizing alternative fuel for the DMU vehicle.