

Diesel Multiple Unit (DMU) Technical Feasibility Analysis

**Planning & Programming Committee
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Metro

Diesel Multiple Unit (DMU)

- DMUs for application on existing Metrolink corridors must be Federal Railroad Administration (FRA)-compliant (Colorado Railcar Manufacturing vehicle shown)
- Non-compliant DMUs have been in use in Europe and the U.S. for several years. Examples include North County Transit District's Sprinter and New Jersey Transit's River Line (shown)

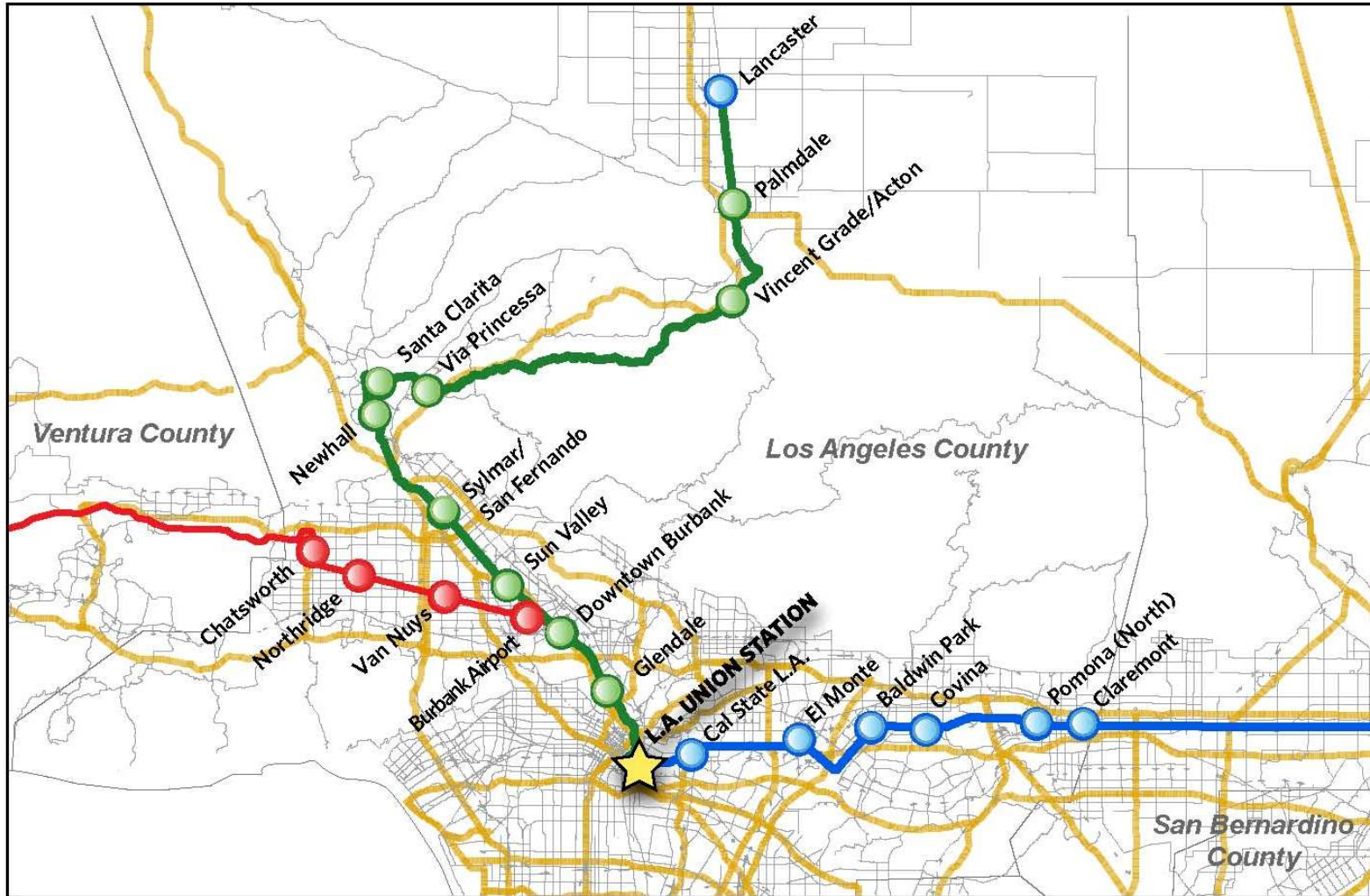


Background

DMU technology considered for our portions of Metrolink-operated lines: Ventura County, Antelope Valley and San Bernardino. Issues examined included:

- **DMU technology and market availability**
- **Fuel options, including clean fuel alternatives**
- **Vehicle performance, including fuel efficiency and emissions profile**
- **Operational capacity**
- **Potential infrastructure improvements**
- **Fleet maintenance options**
- **Community impacts**
- **Potential non-traditional funding sources**
- **Costs**

Three Candidate Corridors



Ventura County Line
Antelope Valley Line
San Bernardino Line
Major Highways

Analysis Assumptions

- **DMU service must be a true overlay service – it must not negatively impact any existing rail operations**
- **Service to be at least hourly off-peak**
- **Service to be considered during peak hours only if no impact to existing commuter operations**

General Conclusions

- **Not cost effective to implement DMU service on three Metrolink corridors at this time:**
 - 12 axle rule requires use of 3-car consist, but only one-car train needed to meet demand
 - 30 cars needed for ten 3-car consists likely requires new maintenance facility
 - No FRA-compliant DMU vehicles on market
- **Future implementation of Positive Train Control and improved grade crossing technologies may eliminate need for 12 axles, could provide future opportunity for development of DMU service on Metrolink corridors**
- **DMU trains preferable for overlay service to locomotive-haul trains from operations cost, fuel economy and emissions perspectives**

Findings

- 1) With the proposed infrastructure improvements, it would be possible to provide hourly off-peak commuter service on all three corridors
- 2) 46 weekday DMU runs could be accommodated on the three corridors with no impact to any existing service
- 3) Estimated 60 riders per three-car train; average weekday ridership of 2,800 passengers
- 4) “Clean Diesel” (Ultra Low Sulfur Diesel (ULSD) + exhaust after-treatments to meet Tier 4 standards) would be required for the DMU fleet; Electric Multiple Unit solution analyzed, but total capital cost to implement was significantly higher



DMU and Metrolink Comparison Table

	DMU	Metrolink	Comments
Capital Costs			
	\$330 M (New Maintenance Facility) \$295 M (Central Maintenance Facility & Eastern Maintenance Facility)	\$274 M (CMF & EMF)	7% cheaper to implement using Metrolink vehicles
Operating Costs			
	\$76.51 per train mile	\$80.75 per train mile	5% cheaper to operate DMU because of lower fuel and maintenance costs
Cost per new rider	\$105,000	\$98,000	7% cheaper to add more Metrolink midday service (due to lower capital costs)
Fuel Economy			
Fuel consumption	81 gallons	113 gallons	DMU 29% more fuel efficient
Emissions*			
Carbon Monoxide (CO)		-38%	38% higher CO emissions for DMU
Particulate Matter (PM10)	-26%		26% less PM 10 emissions for DMU
Nitrous Oxide & Non-Methane Hydrocarbons (NOx + NMHC)	-51%		51% less NOx + NMHC emissions for DMU
Carbon Dioxide (CO₂)	-12%		12% less CO ₂ emissions for DMU



Next Steps

- **Forward report to Metrolink for future consideration**
- **Monitor the progress of:**
 - **FRA-compliant DMU vehicle manufacture;**
 - **DMU propulsion and fuel technologies;**
 - **Development of improved rail signal technologies; and**
 - **FRA's evolving requirements for rolling stock compliance**
- **Continue to consider DMU as part of alternatives analyses in corridor studies**