

**REGIONAL DISTRICT OF BULKLEY-NECHAKO****RDBN FORESTRY COMMITTEE  
(Committee of the Whole)  
Supplementary Agenda**

Thursday, November 5, 2015

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**NEW BUSINESS****ADJOURNMENT**



## Two New 9-Axle B-Train Log-Hauling Configurations Proposed for Use in Central British Columbia: Analyses of Impacts on Forestry Roads and Bridg

Date: June 2015 - Technical Report No. 31



Canadian Forest Products Ltd., Tolko Industries, and West Fraser Timber Co. Ltd., with the assistance of FPInnovations, are seeking to introduce two new, more efficient truck configurations for log hauling in the central interior of British Columbia: a tandem-drive 9-axle B-train and a tri-drive 9-axle B-train. In accordance with the provincial government's new process for approving configurations, in 2014 FPInnovations conducted an examination of the 9-axle B-trains' dynamic performance and road impact (Parker et al. 2014). At the request of the FLNRO's Chief Engineer, additional analyses were undertaken in early 2015 to evaluate the potential impacts of the two proposed 9-axle B-train configurations on forestry roads and bridges.

The analyses of the impacts of the 9-axle B-trains on forestry roads and bridges included: a relative comparison of the force effects of 9-axle configurations on bridge design capacity; a comparison of the swept path through 90° intersections and 5 to 30° turns vs. the swept path of an 8-axle baseline truck; an analysis of 9-axle vertical curve requirements for clearance and for sight distance; and an analysis of the impacts of the 9-axle B-trains on gravel-surfaced roads (i.e., ESALs) vs. the impacts of an 8-axle baseline truck.

The bridge analysis concluded that, for most span lengths, tandem-drive 9-axle B-trains generate slightly higher shear and flexure forces than do the tri-drive 9-axle B-trains. The BCL625, L-75 and L-100 bridge designs were found to have sufficient capacity for all of the 9-axle configurations for simple spans up to 36 m long. The majority of bridges on forestry roads in the central interior of British Columbia are L-75 bridges or L-100 so there should be few bridge-related limitations to the implementation of 9-axle B-train configurations. The L-45 and L-60 bridge designs are capable of withstanding the forces generated by the axle groups of the 9-axle B-trains but not the whole truck; L-45 bridges have sufficient capacity for the 9-axle trucks for spans up to 13 m and L-60 bridges up to 25 m. The 9-axle B-train configurations generate slightly greater force effects than two common 8-axle log hauling units, however, this is not anticipated to require any changes to current bridge design specifications.

The analysis of horizontal road alignment requirements of the new 9-axle B-train configurations found that these configurations required slightly less road width through 90° intersections than that required by an 8-axle B-train baseline vehicle. Compared to the 8-axle baseline truck, the tandem-drive 9-axle B-train required no more than 20 cm, and the tri-drive 9-axle B-train no more than 3 cm, to negotiate a variety of 5° to 30° turns. Given these findings, and given that 8-axle B-trains commonly travel on resource roads in the British Columbia Interior, we conclude that no road widening would be required to accommodate the 9-axle vehicles.

The vertical curve analysis found that the 9-axle trucks have sufficient clearance to pass all crest and sag curves that meet FLNRO's design standards. Similarly, the analysis found that the 9-axle trucks would have sufficient sight distance on all curves that meet FLNRO design standards.

The analysis of potential road impacts associated with the 9-axle trucks concluded that they generate less impact per tonne payload than generated by the baseline 8-axle B-train. Therefore, for hauling

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given volume of timber, the 9-axle trucks should cause less damage to the gravel road surface than hauling were done by the baseline vehicle.

In summary, FPInnovations' analyses indicate that the proposed 9-axle B-trains can be accommodated by existing bridge designs and road design envelopes on forestry roads in the central interior of British Columbia, and that 9-axle B-trains will not inordinately increase the life cycle costs of existing forestry roads and bridges.

## OTHER NEWS

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### Two new drones added to FPInnovations' fleet