

Ministry of Forests, Lands &
Natural Resource Operations

ROAD LOAD RATING PROJECT
2011-12

Project Update

July 10, 2012

Gary McClelland P.Eng.

GOAL OF THE PRESENTATION

- Bring audience up to speed on what has been done up till now
- Summarize what was said in a letter report, dated March 29, 2012 by SNT Engineering Ltd to Brian Chow P.Eng.
- Answer questions
- Solicit input for the next steps

GOAL OF THE ROAD LOAD RATING PROJECT

- To clarify to the stakeholders (Government, Licensees and operators) the safe capacity of the Forest bridges thru a signing program of Posted Limits
- This would be mainly for production tractor-trailer type logging trucks
- But also includes other Heavy Vehicles: Short Trucks and Tracked vehicles

**BRIDGE
LOAD LIMIT**

**63.5
TONNES GVW**

SINGLE AXLE	9 T
TANDEM AXLE	17 T
TRIDEM AXLE	24 T

Posted Limits are needed because:

- Misinformation among stakeholders as to what kind of trucks and loads the bridge loadings can carry
- There is no process for operators to undergo if they want to introduce a new truck style

Posted Limits are needed because:

(Cont'd)

- Original signing is outdated.
- Original Signs were based on when the only logging trucks were 5 axle pole trailers and there was a narrow community of users
- Nowadays there is a wide range of users on the roads (Timber sales, mining, other industries)
- Nowadays there is an ever expanding variety of logging truck styles

Maximum Weights & Sizes

Maximum G.V.W.	91 tonnes
Maximum Weight Axle	21000 kilograms
Maximum Overall Width	3.0 metres
Maximum Overall Height	5.0 metres
Maximum Overall Length	35.0 metres
Maximum Rear Overhang	14.0 metres

Prince George Forest District
2000 South Ospika Boulevard phone 565-7100



BRITISH
COLUMBIA

Ministry of Forests

- Project could almost be renamed
“Road Load Rating Communications”

TERMS OF REFERENCE FOR WORK DONE IN 2011-12

- To provide technically defensible Posted Limits for the various logging truck design vehicles
- L45, BCL625, L75, L100, L150, L165,
- Light Off Highway (LOH), Heavy Off Highway (HOH)
- a short truck
- tracked vehicle

COMMENT ON POSTED LIMITS

- The challenge of Posted Limits from a structural engineering perspective is the amount errant overloading any truck population will deliver
- The lower the amount of errant overloading a bridge sees the higher the posted limits can be

COMMENT ON POSTED LIMITS

cont'd

- Standard MOT limits are based on Normal (NP) type traffic
- Logging traffic behaves more like Annual Permit traffic (PA) i.e. lesser errant overloading than NP traffic

Assumptions

- Was done through broad scale screening type techniques rather than looking at detailed designs of real bridges
- The resistance of the various structures are correctly designed to just accommodate the respective design vehicles at the time
- Dead load was not considered.

Assumptions

Cont'd

- If the posted limits of the particular design vehicle generate factored force effects less than the factored force effects used at the time of the design the posted limits are safe
- structures that have been down rated will require their own signage
- structures that have been uprated through techniques like CHBDC Section 14 may not be captured by these techniques, will have to be looked at individually and may require their own signage

Logging Truck Traffic

- was done by Darrel Gagnon P.Eng. of Buckland & Taylor Ltd
- captures all of the tractor–trailer type logging trucks (Conventional pole, B-trains, jeeps, tridem tractors-quad trailers, etc.)
- was done by looking at large amounts of real logging truck population data; doing statistical analysis on the data and deriving truck loading characteristics for the various populations and applying to the various logging truck design vehicles.

Logging Truck Traffic

cont'd

- Was based on PA traffic
- There is good information on the logging truck populations in reports done by Darrel titled ‘Design Vehicle Configuration Analysis and CSA-00 Implication Evaluation Phase I, II & III’ done 2003 & 04.





Short Truck and Tracked Vehicle

- Was done by Gary McClelland of SNT Engineering Ltd
- Short Truck captures the “Straight truck” type vehicles. Gravel trucks, rock trucks as well as rubber tired equipment such as graders etc



Short Truck and Tracked Vehicle

cont'd

- Tracked vehicles captures tracked vehicles like excavators, yarders, cats etc



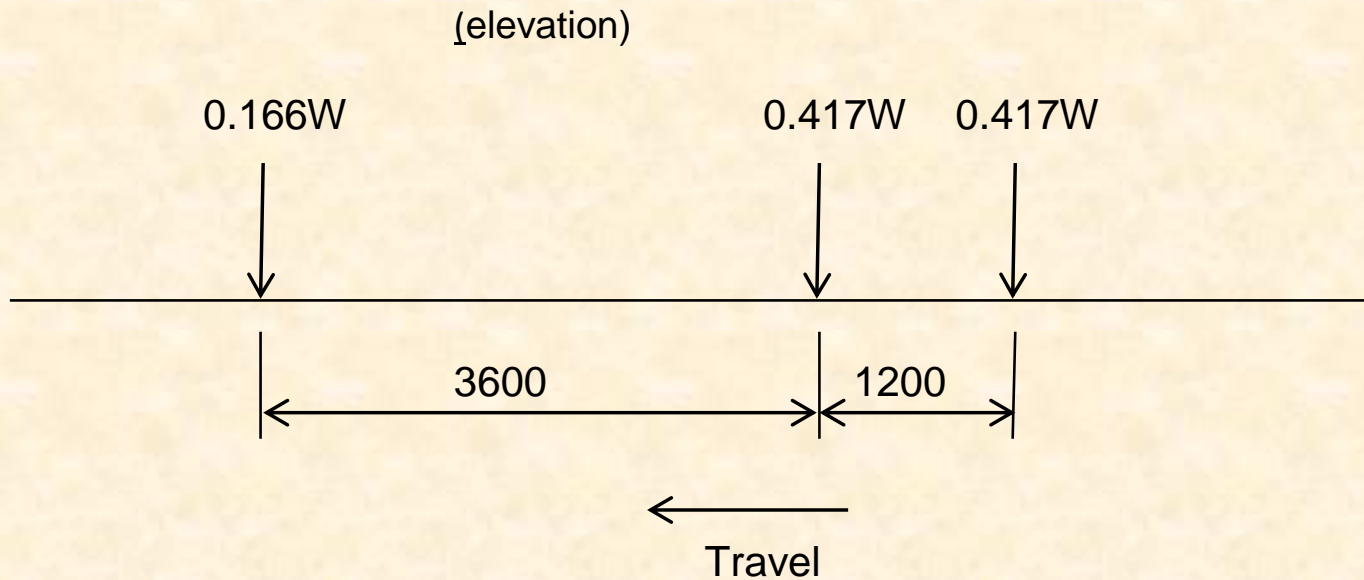
Short Truck and Tracked Vehicle

- Was done by assuming a specific loading arrangement to conservatively represent the vehicle types. The representative model was then analysed for various design loadings and spans and adjusted until the factored force effects approached the factored force effects of the various design vehicle.
- Assumed NP traffic

ROAD LOAD RATING PROJECT

SCHEMATIC OF SHORT TRUCK

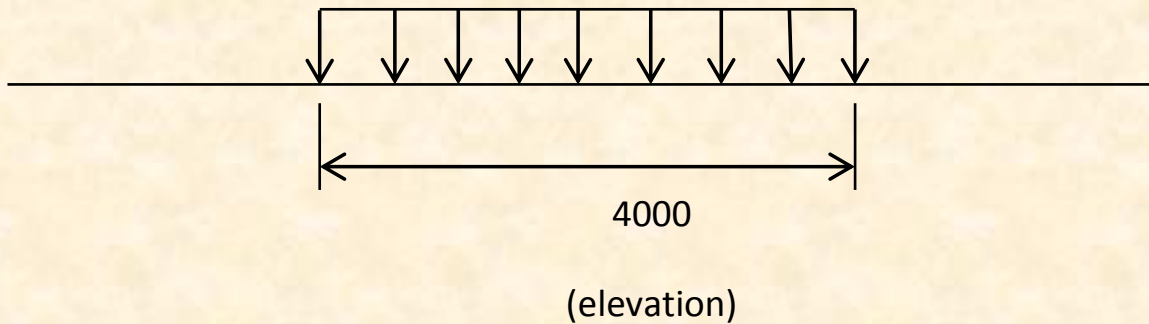
Based on
CHBDC Section 14 Level 3 Evaluation Truck



ROAD LOAD RATING PROJECT

SCHEMATIC OF TRACKED VEHICLE

$$W = u \times 4000$$



Short Truck and Tracked Vehicle

- There are no codes, population data or guidelines for off highway short truck or tracked vehicle traffics and thus the values presented are very conservative compared to the logging truck values.

Recommended Posted Limits Of Various Forest Road Industrial Traffic Types Lighter Trucks

Design Vehicle	Max. G.V.W. T.	Max. Single Axle T.	Max. Tandem Axle T.	Max. Tridem Axle T.	Max. Short Truck T.	Max. Tracked Vehicle T.
L45	43.5	8.5	16.1	17.7	25.5 (24.6)**	25
BCL 625	63.5***	9.1***	17***	24***	33.2 (26.1)**	33
L75	72.6	14.3	26.9	29.6	35.8 (41.1)**	35
LOH	83.2	20.3	38.3	42.1	46.4 (58.6)**	44

Recommended Posted Limits Of Various Forest Road Industrial Traffic Types Heavier Trucks

Design Vehicle	Max. G.V.W. T.	Max. Single Axle T.	Max. Tandem Axle T.	Max. Tridem Axle T.	Max. Short Truck T.	Max. Tracked Vehicle T.
L100	96.7	19	35.8	39.4	46.9 (54.8)**	44
HOH	129.4	31.5	59.5	n.a.*	71.4 (91)**	67
L150	145.2	28.5	53.7	n.a.*	69.9 (82.2)**	66
L165	159.6	31.3	59.1	n.a.*	89.8 (90.4)**	85

Benefits to the Ministry

- Adds much needed clarity as to loads the various bridges can carry. Using only maximum GVW is too crude a criteria. Leaves too many avenues for debate
- Increased Safe Payload for operators which should imply more stumpage revenue for Crown

Issues for Discussion and Decision

- A more detailed analysis should be undertaken for the L45s
- L45 Posted Limits values recommended by B&T are considerably less than the currently designated “Highway loading” of L45s.
- If enforced most modern truck configurations would be required to reduce their loads to 70% of what they are used to.
- Operators would ignore the Posted Limits or not haul at all.

Issues for Discussion and Decision

- Consideration in putting these values in permitting documents
- Load rating policy?
- Bridges not captured in this broad screening

Issues for Discussion and Decision

- What information to put on the sign. Just have the Limits similar to MOT (Max GVW, Max Single Axle, Max Tandem Axle, Max Tridem Axle) and deal with Short Truck and Tracked Vehicle maximums in Permits or alternately have all of the Posted Limits on the sign.

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Further Work

- Research into loading of tracked vehicles
- Look into whether the broad screening techniques applies to Glulams (or at least the remaining Ministry Glulams)

Next Steps in the Road Load Rating Project

- Develop a sign
- Put the values in all of the relevant permits
- Develop a load rating policy if deemed necessary



A Federal tractor (perhaps a Model WD rated 3-1/2 ton, selling @ \$3950) with a Washington state plate, hauls a huge log out of the woods on a plank road. A linen backed photo, it is dated June 5, 1918.