

NEW GENERATION WIDE BASE SINGLE (NGWBS) TIRES STUDY

COST-BENEFIT ANALYSIS OF THE
REMOVAL OF THE WEIGHT LIMITATION
FOR NGWBS TIRES

December 2015



2014 SUMMARY PRESENTATION

- Load parity on tandem configuration is very important for Canadian operations.
- Expected uptake based on Canadian & US reference under 20%.
- Observations + Data analysis suggest that in actual operation less than 25% of vehicles are loaded above US load of (7700kg/axle) in line haul operation.
- Weight parity on NGWBS tire is expected to have the following impact compared to current situation:
 - Benefits will be seen from approx 20% of the units that assume uptake.
 - Disadvantage (if any) will result from less than 5% of the units.
 - Canadian fleets need the flexibility to be able to run on NGWBS with load parity based on each Provincial jurisdiction.



WSP | PB STRATEGIC CONSULTING

- **Jean-David Beaulieu : Economist with 10 year of experience**
- **Strategic consulting group**
 - 30 professionals across Canada
 - Business case
 - Cost-Benefit Analysis
 - Market Studies
 - Feasibility studies
 - Financial Analysis



WSP TRANSPORTATION ECONOMICS EXPERIENCE

- BCA for the removal of the weight penalty for NGWBS tires in Quebec, Client: MTQ
- Business case for the construction of the road 167 in northern Quebec, Client MTQ
- Business Case and BCA for the upgrade of the Ottawa international Airport, Client: Ottawa airport authority
- BCA for the White Rock Road improvement project, Client: City of Rancho Cordova
- Over 30 BCA for private, public and institutional clients in the last 5 years



BCA ANALYSIS : SCOPE

- British-Columbia
- Alberta
- Saskatchewan
- Manitoba
- New Brunswick
- Nova Scotia
- Prince Edward Island
- Newfoundland



BCA ANALYSIS : SCOPE

- 2 NGWBS damage scenarios were used in the study to validate the results
 - Scenario 1: MTQ 2004
 - Scenario 2: US DOT 2009
- Based on a 20 years period (2014-2035)
- All the results are in net present value
- Robustness to additional damage, uptake and discount rate was tested through sensitivity analysis



BCA ANALYSIS : BENEFITS CONSIDERED

- CO2 emissions
- Volatile Organic Compounds (VOC) emissions
- NOx emissions
- Fatality accidents
- Injury accidents
- Fuel savings
- Maintenance savings
- Tire environmental fee
- Cost of retread



COST SCENARIO A : MTQ

- Damage in \$ per km is based on a study from the MTQ
- 100% NGWBS tires uptake and every vehicle operates at his weight limit
- The damage per km is based on the number of axles.
- ↑ number of axles = ↑ \$/km
- Overall, the increase in damage from NGWBS tires in this study in today's value is :

0.0098 \$ per km



COST SCENARIO A : WSP

- The \$ per km in the West is based on the average axle configuration in Alberta
- The \$ per km in the East is based on the average axle configuration in Nova-Scotia
- Alberta has a higher % of 6+ axle vehicle than Nova-Scotia and Quebec.
- \$ per km is higher in the West than in the East
- 7 % baseline uptake (2014) that reaches 25% in 2035



SCENARIO A : ADDITIONAL DAMAGE PER KM

- **0,0157 \$ per km** in the Western provinces
- **0,0093 \$ per km** in the Eastern provinces
- 0,0098 \$ per km in Quebec (ref.)



SCENARIO A : RESULTS

- Benefit to costs ratio (B/C) in Alberta = 1.4
- Benefit to costs ratio (B/C) in Nova-Scotia = 2.2
- To reach a break-even point (B=C) the additional \$/km should be:
 - In Alberta : **0.0221 \$/km** vs. 0.0157 \$/km (ref.)
 - In Nova-Scotia : **0.0218 \$/km** vs. 0.0093 \$/km (ref.)
- These \$/km are more than twofold higher than what is found in the MTQ study 0,098 \$/km



SCENARIO A : CONCLUSION

- There might be some differences in the road construction process across the provinces.
- However, to reach the break even point, the roads in the provinces under the CBA scope should be **TWICE** more vulnerable to NGWB tires than what was calculated by the MTQ in Quebec.



SCENARIO B : US DOT 2009

- Damage in \$ per km is based on a study from the Federal Highway Administration (baseline damage) and from the US DOT (additional NGWB damages)
- The damages are higher in a urban environment than in a rural environment
- On average (all types of heavy trucks with NGWB tires) will cause 1,25 more damage than trucks with duals



SCENARIO B : ADDITIONAL DAMAGE PER KM

- In Alberta 0,0028 \$/km
- In Nova-Scotia 0,0024 \$/km
 - ≈ Five times less \$/km than in scenario A



SCENARIO B : RESULTS

- Benefit to costs ratio (B/C) in Alberta = 5.17
- Benefit to costs ratio (B/C) in Nova-Scotia = 3.3
- To reach a break-even point (B=C) the additional \$/km should be:
 - In Alberta : **0.0221 \$/km** vs. 0.0028 \$/km (ref.)
 - In Nova-Scotia : **0.0218 \$/km** vs. 0.0024 \$/km (ref.)



SCENARIO B : CONCLUSION

- This scenario is way more optimistic than what we've seen in the MTQ study
- To reach the break even point, the \$/km should be multiplied by ≈ 10



OVERALL RESULTS

- The BCA is positive for each of the costs scenarios in all of the provinces.
- The fuel savings results in an important reduction in greenhouse gas emissions
- There are net benefits in terms of transportation safety (reduction in death and injuries)
- The B/C ratio is in line with what was observed in MTQ 2004.



THANK YOU FOR YOUR ATTENTION.

For further information and to obtain a copy of the Cost Benefit Analysis please contact:

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