

Proposed introduction of 50MAX HPMV (Formerly known as Lower Bound HPMV)

A joint freight initiative
between the NZTA, Road
Transport Forum, and RCA
Forum Research &
Guidelines Group



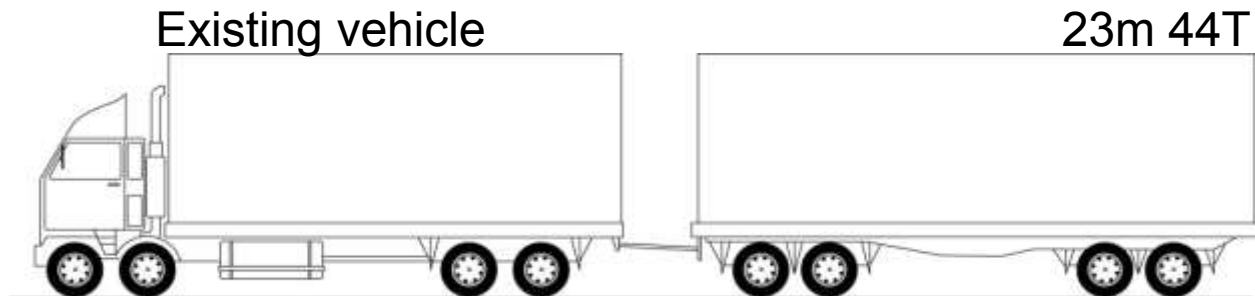
Prepared for Construction Clients Group
Wednesday 17th July 2013

50MAX HPMV - overview

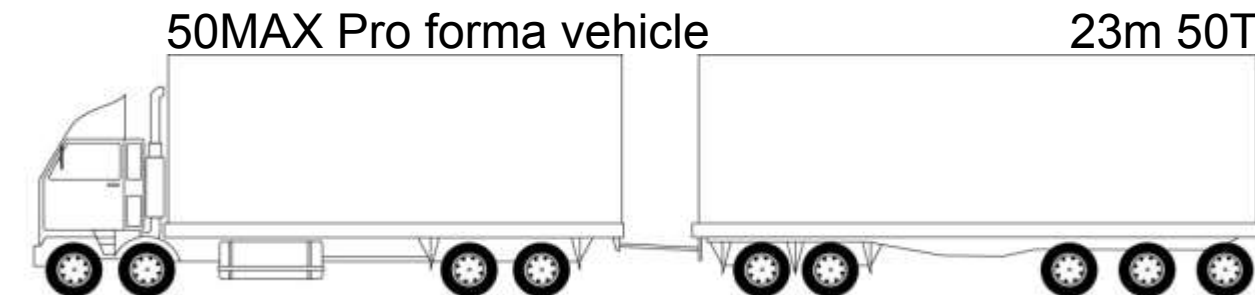
Aim:

- Moving more freight with less trucks
- Bigger returns for producers and communities
- Increase allowable weight to 50T, cost neutral impacts on bridges and pavements, and pro forma vehicle designs that conform to VDM
- Unleash freight productivity with no investment and alleviate asset management concerns
- NZTA issues permits for all roads in a region with list of excluded bridges

Limited to new vehicle types – Pro forma 23m truck and trailer



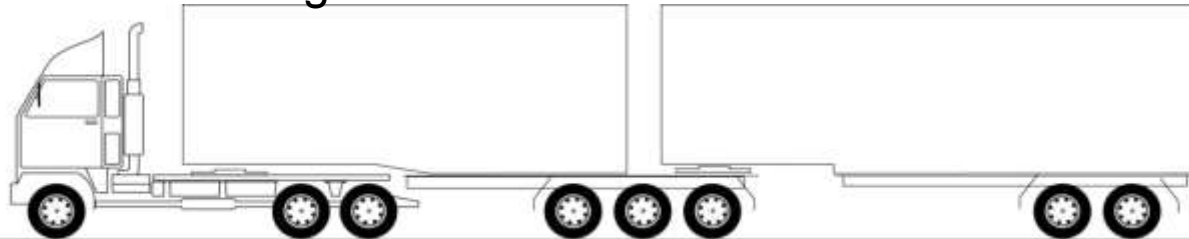
- Same swept path as quad semi truck
- Additional axle to disperse loads and prevent pavement wear



Limited to new vehicle types – Pro forma 23m B-Train

Existing vehicle

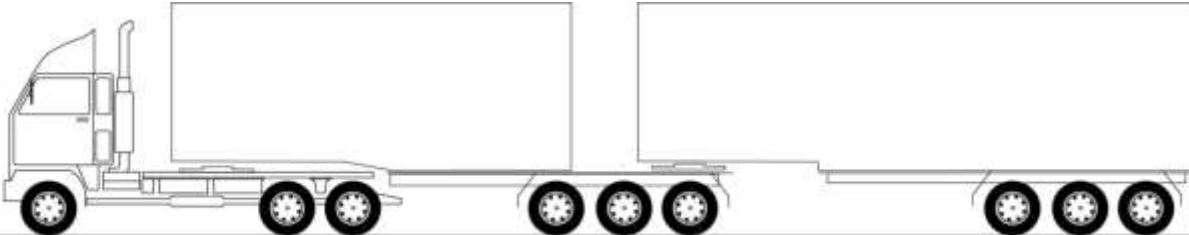
23m 44T



- Same swept path as quad semi truck
- Additional axle to disperse loads and prevent pavement wear

50MAX Pro forma vehicle

23m 50T



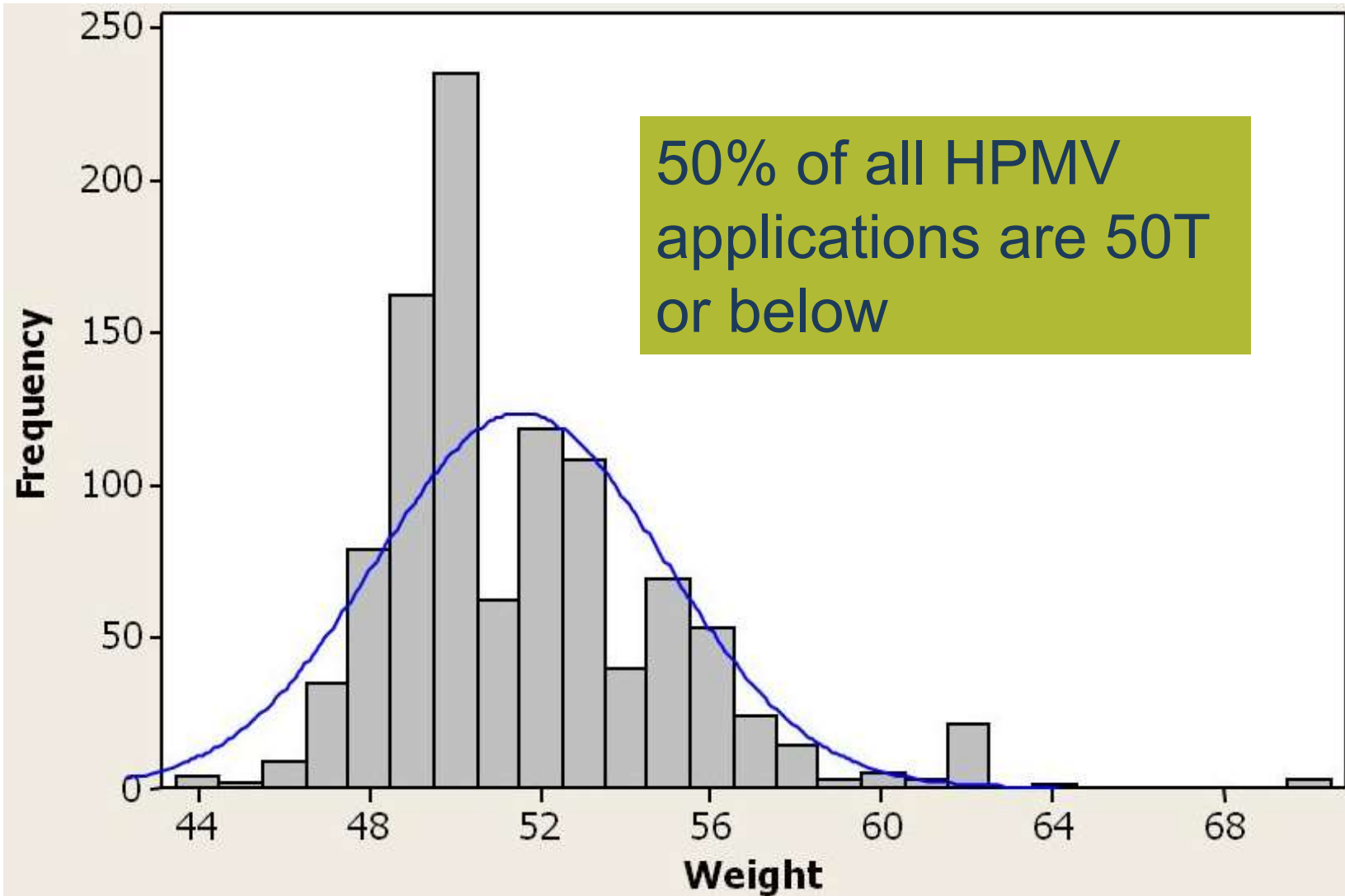


HPMV Route investment 2012-15

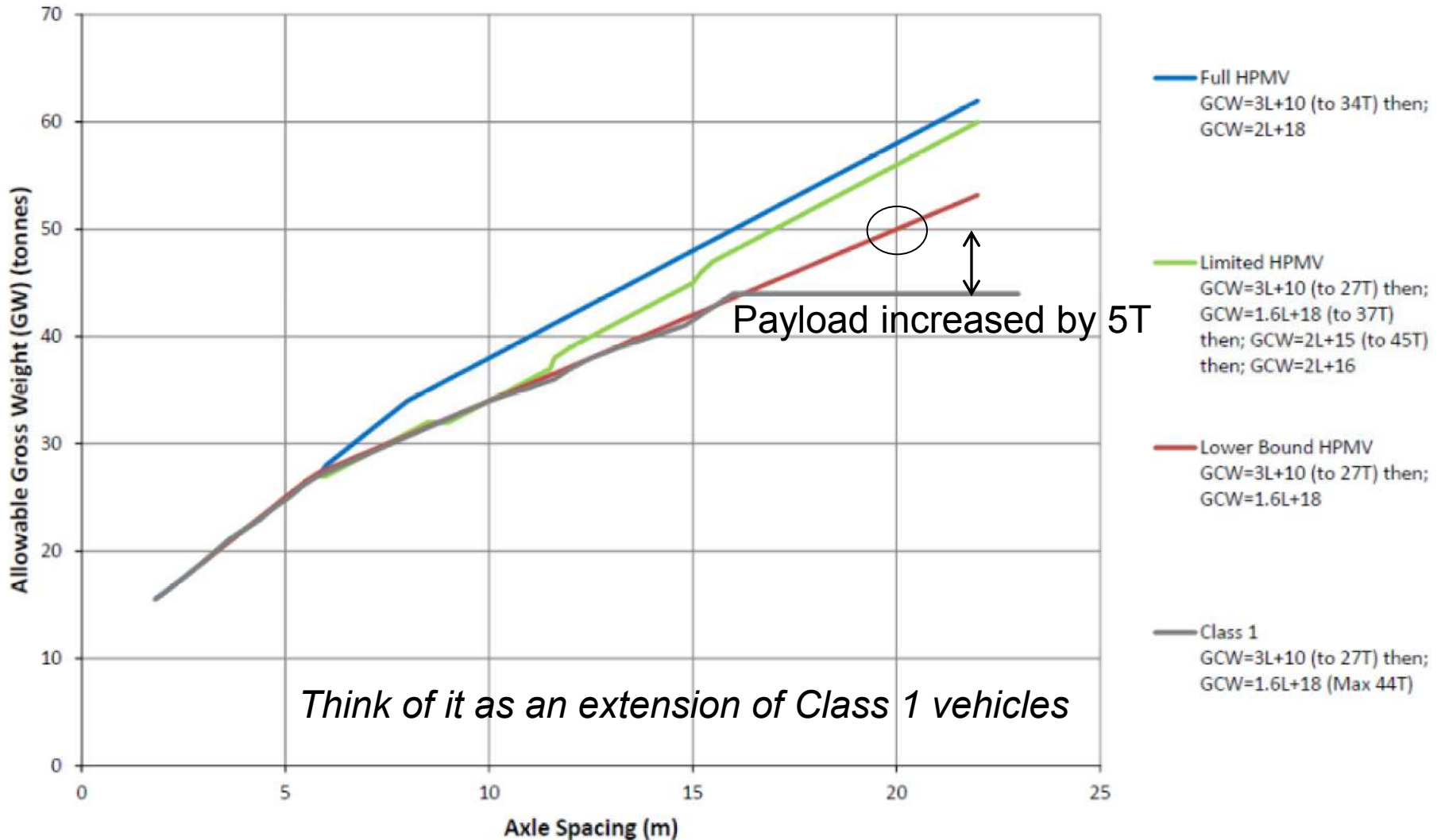
- 50% of the total freight task is carried on 95% of network. 50MAX vehicles provides an economically viable solution without upgrading local roads
- The strategic freight network (HPMV investment routes) opens up 4500 km of most productive corridors to 62T vehicles. This is 5% of total road network carrying 50% of freight



HPMV mass applied for



50MAX HPMV replicates Class 1 load curve beyond 44 tonnes for wheelbases >16m



50MAX HPMV – Bridge Capacity

The table should only be used by experienced civil/structural engineers, in conjunction with a review of the structures condition, structural form and failure mechanisms. The table should not be relied on for a structure that contains any critical structural weaknesses that could create a non-ductile failure mechanism under live loading.

Design Loading	Construction Date	Acceptable Span Range		
		Lower Bound HPMV (with Class 1 AWF)	Ltd. HPMV (with Class 1 AWF)	Full HPMV (with Class 1 or HPMV AWF)
HN-HO-72	1972-	All spans	All spans	All spans
H20-S16-T16	1961-1971	All spans	0 – 50m	0 – 45m
H20-S16-44	1944-1960	0 – 30m	0 – 25m	0 – 20m
H20-S16-41	1943	All spans	0 – 25m	0 – 20m
Traction Engine	1933-1942	0 – 25m*	0 – 17m*	-

* Provided bridge is unposted and is assessed as being able to safely support Class 1 vehicles.

Table 4.2: Acceptable Span Ranges for Limited and Full HPMV's for Various Design Loadings

Bridge capacity

- All “Unposted bridges” up to about 25m span should be able to carry 50MAX HPMV’s
- The initial approach for bridges with spans greater than 25m is to post with a Class 1 limit
- Over time, there may be a desire by RCAs to open up some posted bridges on strategic routes after re-analysis, or by strengthening or replacing

Tracking on the network

Vehicle Configuration	Off-tracking (m)			
	12.5m radius	25m radius	50m radius	100m radius
19m quad semitrailer	3.95	1.81	0.74	0.22
20m 4-axle truck and 4-axle trailer	2.90	1.02	0.31	0.16
23m HPMV 50MAX truck and trailer	3.94	1.61	0.56	0.18
23m HPMV 50MAX B-train	4.07	1.51	0.49	0.09

Reviewed by the RCA Forum Research & Guidelines Group

- 50MAX HPMV pro-formas have a neutral impact on pavement loading
- Access to almost all of the network, excluding posted bridge locations
- Viable business case shows \$100M net reduction in transport costs by year 4
- Reduction in transport costs will increase the return to the producer and hence the community with greater opportunities for economic growth

Our activities

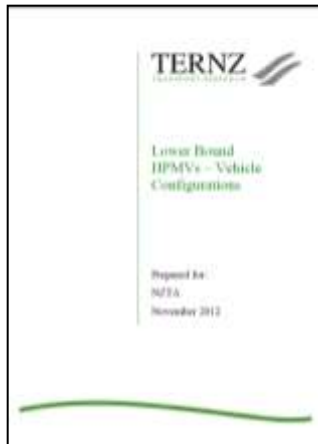
- Present to various forums for roading managers, CEs & Mayors, NZTA through their Regional Directors
- Completed our screening of SH bridges and providing guidance to local authorities
- Simplified permitting of pro-formas done by NZTA on behalf of LAs. No bridge checks (Jul-Aug)

Project needs from local authorities, if accepted for implementation

- Road Controlling Authorities to identify their problem bridges with $>25\text{m}$ spans (may become 'do not cross' as permit condition)
- NZTA seeks 'letter of delegation' with their approval for NZTA to issue permits for pro forma vehicles on behalf of RCAs

50MAX Resources

(www.nzta.govt.nz/50MAX)



- Business case
- HPMV load limits for bridges
- Pavement impacts
- Vehicle configurations
- Vehicle tracking comparisons
- Bridge guidance for RCAs