Victorian Freight Intelligent Transport Systems (ITS) Trials

Higher Productivity Freight Vehicles at Higher Mass – Victorian Trial of On-Board Mass Monitoring (OBM) Technology

Introduction:

Container Transport Alliance Australia (CTAA) is supporting a range of road transport logistics providers, in collaboration with major manufacturers, agri-producers and exporters, to pursue much needed road freight productivity improvements in Victoria.

These companies include:

<table>
<thead>
<tr>
<th>Transport Company</th>
<th>In Collaboration With:</th>
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<tbody>
<tr>
<td>Arrow Transport &amp; Logistics</td>
<td>Fonterra</td>
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<tr>
<td>Rocke Bros. Transport</td>
<td>GrainCorp</td>
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<tr>
<td>Riordan Grain Services</td>
<td>Ridley AgriProducts</td>
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</tbody>
</table>

In addition, other companies supported by CTAA are keen to pursue opportunities to safely and sustainably unlock latent road freight productivity in Victoria through the use of Higher Productivity Freight Vehicles (HPFVs) at higher mass. These companies include:

- Qube Logistics
- Chalmers Industries
- Wettenhall Container Logistics
- Booth Transport
- Toll Intermodal
- Wettenhalls Group (DRW Investments)
- Millers Transport Group
- Cargo Freight Services (CFS)

The majority of the above-mentioned transport companies operate Higher Productivity Freight Vehicles (HPFVs) in Victoria, either on restricted access at higher mass on Port of Melbourne precinct regulated routes, or at lower allowable mass than the vehicles are capable of carrying on the broader Victorian road network, and/or in other States where greater mass limits are allowed.

The use of appropriate technologies to assist in achieving higher mass limit access in Victoria is the subject of this Freight ITS Trial proposal.
Higher Productivity Freight Vehicles – Road Access at Higher Mass:


The Cubic Freight Network strategy allowed these longer, safer road transport combinations (up to 30 metres in length in metropolitan Melbourne, and up to 36.5 metres in length on regional freight routes) to operate more broadly, albeit only at the Higher Mass Limit (HML) available to B-Doubles.

The regional access routes included:

- The Princes Highway West to Geelong
- The Western Freeway to Ballarat
- The Calder Freeway to Bendigo
- The Hume Freeway to Wodonga
- The Princes Highway East to Traralgon

Within Metropolitan Melbourne, access was permitted on:

- The Monash Freeway, to provide access from the South East to the Port of Melbourne;
- CityLink;
- EastLink;
- The Western Ring Road; and
- The West Gate Freeway

“Last mile” access is also considered on appropriate arterial and local roads. This requires consultation with VicRoads and local government (road managers under the Heavy Vehicle National Law (HVNL)) to ensure that the “last mile” roads can safely accommodate these longer combinations.

Since the commencement of the Heavy Vehicle National Law (HVNL), access applications are made through the National Heavy Vehicle Regulator (NHVR) – www.nhvr.gov.au.

HPFVs must be approved under the national Performance Based Standards (PBS) Scheme (External link), administered by the NHVR, and must participate in the Intelligent Access Program (IAP) for route compliance.

HPFVs must also not exceed the mandatory speed limit of 90 km/h on the nominated roads.


Another key action under Direction 6 of the Victorian Freight Strategy is to “identify and progressively declare, subject to necessary road upgrades, a Mass Freight Network for access by HPFVs operating at higher mass limits.”

The use of the latest Freight ITS technologies will assist the current Victorian Government to expedite road declarations for HPFV access at higher mass limits.
There are now numerous HPFVs operating on Victorian metropolitan and regional roads under the Cubic Freight Network strategy, as well as under restricted access in the Port of Melbourne precinct.

Since 2013, these vehicle combinations have proven their worth on the wider Victorian road network, with an enviable safety record and with little community concern.

The prominent vehicle design in container transport (skel-trailer) configuration has been the Super B-double. However, a more flexible A-double configuration operated by Arrow Transport & Logistics servicing freight tasks in metropolitan Melbourne and to/from Gippsland has had outstanding success (bottom left picture above).

These vehicle combinations are designed to carry additional mass, and the Victorian economy is missing out on the freight productivity improvements inherent in the optimum use of these combinations, capable of carrying two loaded, heavy 40’ containers (4 x Twenty Foot Equivalent Units (TEU)).

Because of the spread of the payload weight over more axles, an A-double is designed for a maximum of 85.5 tonnes GVM (with a prime mover meeting the standards for a steer axle mass of 6.5 tonnes), compared with a nine axle B-double combination with a GVM of 68.5 tonnes at Higher Mass Limits (HML). For Super B-doubles with a quad / tri-axle configuration, the GVM at HML can be 73 tonnes (with a maximum of 27 tonnes over the quad axle group).
Higher Mass Limits for HPFVs in Queensland – Use of On-Board Mass Monitoring:

The productivity improvements that can be achieved through access to an identified and mapped road network for HPFVs at Higher Mass Limits (HML) is best typified by the Queensland example.

Prior to and in line with Moving Freight (the Queensland 10-year freight strategy adopted in 2013 http://www.tmr.qld.gov.au/business-industry/Transport-sectors/Freight/Moving-Freight.aspx) - the Queensland Department of Transport and Main Roads (TMR), in conjunction with ARRB Group, progressively assessed its PBS Class 2 road network allowing vehicles up to 30m in length to operate at higher mass on roads that had previously been restricted to vehicles up to 26m (Class 2B assessment), providing significant productivity benefits. More restricted PBS Level 3 routes for vehicles up to 36.5m in length have been assessed and published also.

A direct beneficiary of the progressive TMR road network assessment strategy has been the cartage of heavy containerised grain exports between Toowoomba and the Port of Brisbane by A-doubles (Level 2B PBS vehicles), leading to a 30% increase in productivity, and a reduction on up to 50% of vehicle trips, with attendant positive road safety, road congestion, reduced fuel usage and environmental outcomes.

On-Board Mass Monitoring:

Following initial trials in 2010, a key regulatory requirement applied by Queensland TMR to PBS Level 2 road network access by HPFVs has been the introduction of the Interim On-Board Mass (OBM) Systems monitoring solution for regulatory compliance purposes.

Transport Certification Australia (TCA) completed testing of on-board mass monitoring systems (OBM) in 2009 (http://www.tca.gov.au/images/stories/pdfs/OBM_test_report_FINAL.pdf), and has promulgated specifications for evidentiary OBM certification.

The regulatory benefits of OBM is that it ensures that gross and axle group limits are not breached, while also ensuring that the operator can get the ideal load distribution to the maximum allowable payload under approved access conditions.

Industry Support for On Board Mass Monitoring Trials in Victoria

Container Transport Alliance Australia (CTAA) has supported major agri-producers and exporters, together with their transport providers, to bring to the attention of the Victorian Government the urgent need to unlock road freight access productivity and to adopt new technologies that will help to regulate access at higher mass.

Breakfast meeting with Victorian Minister for Roads & Road Safety, and Minister for Ports, Hon. Luke Donnellan MP, and freight industry representatives, Tuesday, 31 March 2015

Brief examples of potential freight productivity enhancements are:

- Doubling of export volumes from a major milk powder manufacturing plant in East Gippsland – without the use of HPFVs at higher mass, there will be more than a doubling of truck movements as product is road freighted to Melbourne distribution centres for container packout prior to transport to the Port of Melbourne. This also involves double handling of the export freight.

  The use of A-doubles at higher mass would reduce truck movements by up to 50% to meet this growing and important export freight demand.

- Heavy containerised grain exports from Geelong to the Port of Melbourne:
  - Export task of approx. 17,000 x 20’ Containers per annum. With single trailer combinations – 8,500 trips to Geelong with 2 x 20’ empty containers on board & 17,000 trips from Geelong to Port of Melbourne with one loaded 20’container on board (due to mass limit restrictions) = 25,500 truck trips;
  - With A-double combinations at higher mass – 4,250 trips to Geelong with 4 x 20’ empties on board & 8,500 return trips with 2 x 20 loaded containers on board = 12,750 truck trips = Saving of 12,750 truck trips per annum on the Geelong Road.

- Heavy containerised grain exports from Lismore, Meredith & Lara to the Port of Melbourne:
  - 30,000 tonnes per annum of containerised freight for shipment to Tasmania
  - Current task undertaken with B-doubles at HML (68.5 tonnes) = 660 round truck trips
  - Use of Quad/Tri B-doubles at HML of 73 tonnes GVM = 600 round trips – a reduction of 60 round truck trips per annum.

There are numerous other examples of significant freight productivity enhancements available from the companies who would participate in the trial of OBM technology as a regulatory condition of HML access for HPFVs.
Victorian Trial of On-Board Mass Monitoring (OBM) Technology:

Under the Industry Framework for Trialling Road Freight Intelligent Transport Systems and Associated Technologies program, it is proposed that a trial of On-Board Mass Monitoring (OBM) proceed as a regulatory requirement of the implementation of the Mass Freight Network in Victoria for access by Higher Productivity Freight Vehicles (HPFVs).

While OBM has been trialled in other States, this new freight technology has not been applied or proven in the Victorian context. The application of OBM technology would also impact on the nature of the road and bridge structure assessments by VicRoads as more accurate weight data will be available.

The freight companies supported by the CTAA are not seeking any direct funding allocation from the Government under the Freight ITS Trial criteria.

Instead, companies are willing to invest significantly in PBS standard prime mover and trailing equipment, and to invest in OBM technology under the Intelligent Access Program (IAP). In return, the companies are seeking a concerted & collaborative approach with the Government, VicRoads and the National Heavy Vehicle Regulator (NHVR) to achieve Victorian regional and metropolitan road access for HPFVs at higher mass limits in the shortest possible timeframe.

In this case, the resourcing and funding implications for VicRoads include concerted efforts to assess and map the Victorian road network against PBS Level 2B and Level 3 criteria, including necessary bridge structures, and to accept road access permit applications lodged by operators with the NHVR for appropriate HPFV combinations at higher mass.

Appendix A to this submission sets out an analysis of the Strategic & Technical Principles contained in the Industry Framework document, including potential risks and mitigation measures.

Conclusion:

The rising freight task in Victoria, and the forecast growth of containerised imports and exports through the Port of Melbourne in particular, requires an innovative and progressive regulatory response.

As has occurred in other States, Victoria urgently needs to unlock the latent productivity in the existing road network through a combination of concerted road access assessment, HPFV investment by industry, and the innovative use of new freight technologies to monitor compliance.

The use of HPFVs on the broader Victorian metropolitan and regional road network has been proven under the Cubic Freight Network policy. The vehicle combinations incorporate superior safety features, including better braking, underrun protection and other road safety features. The existing HPFVs on the Victorian road network have an enviable safety record.

Community amenity or concerns have not been impacted by the broader use of HPFVs. Alternatively, not acting to allow HPFV access at higher mass limits will impact negatively on community amenity and road safety as more and more trucks are required to meet the growing freight task. The use of HPFVs at higher mass will contribute to road safety through the reduction of the number of trucks required for the freight task.

The transport operators supported by CTAA are willing to invest in and trial On Board Mass Monitoring (OBM) technologies as a regulatory criteria for HPFV higher mass access. Such monitoring, in conjunction with existing route compliance monitoring under the IAP, will give the Government “real time” regulatory certainty that mass limits and other permit conditions are not being breached.
### Strategic & Technical Principles

<table>
<thead>
<tr>
<th>STRATEGIC PRINCIPLES</th>
<th>BENEFIT</th>
<th>DISBENEFIT</th>
<th>POTENTIAL RISKS &amp; MITIGATION MEASURES</th>
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<tbody>
<tr>
<td>Efficient movement of people and goods throughout the transport system</td>
<td>√</td>
<td>√</td>
<td>The potential risk exists for trucks to be overloaded. The use of OBM technology and real-time monitoring will ensure that HPFVs are not overloaded on any axle group or GVM limits.</td>
</tr>
<tr>
<td>Reliable movement of people and goods throughout the transport system</td>
<td>√</td>
<td>√</td>
<td>The potential risks exist for the HPFVs in the trial not to be used to the optimal carrying capacity (i.e. able to carry 4 TEU per trip but carry less). Monitoring and constant reporting throughout the trial will encourage companies to optimize carrying capacity.</td>
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<tr>
<td>Access to residences, employment, markets, services and recreation</td>
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<td>Alignment with the SmartRoads Road Use Hierarchy</td>
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<td>Financially sustainable technology initiative (short and long term costs are self-funded)</td>
<td>√</td>
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<tr>
<td>Road Safety resulting from this initiative</td>
<td>√</td>
<td></td>
<td></td>
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<tr>
<td>Local and community amenity</td>
<td>√</td>
<td>√</td>
<td>There is a potential risk for trucks to not adhere to approved routes or be overloaded. These risks are mitigated by the use of real-time monitoring and reporting. This has not been an identified issue since the introduction of HPFV permits.</td>
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<tr>
<td>Public transport use, walking and cycling</td>
<td></td>
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<tr>
<td>Environmental sustainability</td>
<td>√</td>
<td>√</td>
<td>HPFVs will meet Euro Emission Standards. The reduction in vehicle trips will have significant impact on the environment through reduced fuel usage and lower greenhouse gas emissions.</td>
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<tr>
<td>TECHNICAL PRINCIPLES</td>
<td>MEET (Y/N)</td>
<td>IF NO, DETAIL WHY</td>
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<td>Consistency with <em>Policy Framework for ITS in Australia</em></td>
<td>Y</td>
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<tr>
<td>Compatibility with existing VicRoads systems &amp; equipment</td>
<td>Y</td>
<td></td>
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<tr>
<td>Compatibility with other technology or systems already used in sector</td>
<td>Y</td>
<td></td>
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<tr>
<td>Nonproprietary systems &amp; equipment</td>
<td>Y</td>
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<td>New proposal not yet trialed or in use in Australia</td>
<td>N</td>
<td>Other States have instigated the use of OBM to manage Higher Mass Limits on HPFVs. However, a trial of OBM telematics will add significantly to the body of metrics to be used by VicRoads Infrastructure Engineers in determining future investment projects for the Victorian Road System, and will validate the technology in the Victorian road access context.</td>
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<tr>
<td>Systems and equipment has not been previously assessed for type-approval or product acceptance by any other Australian government agency</td>
<td>N</td>
<td>TCA technical specifications for evidence based OBM exists, and several IAP service providers, in collaboration with mass monitoring technology application providers, have been approved.</td>
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<td>Long term sustainability and effectiveness</td>
<td>Y</td>
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