Sustainable Freight Transport and Logistics in Mekong Sub-region

Trailer Swapping

Bangkok January 21\textsuperscript{st} 2019
Sustainable transport

- Trucks and Trailers
- Economic Benefits
- Demand projections
- How it would work
Recognizing Realities

- Multi Modal Transport serves the Import of Consumer Products from developed countries more than it does the needs of local SMEs.

- Non-Physical Barriers present the most insurmountable obstacles.

- Because of these non-physical barriers, new roads and bridges have done little to improve market access or participation in the Global Supply Chain for SMEs in the hinterland.

- Consequently, transport is more expensive than it needs to be.
Trailer Swapping

- Trailer swapping at borders as step towards CBTA implementation
  - Reduces border handling costs and times and costs
  - Reduces vehicle weight by 3.5 tons if integral trailers are used
  - Reduces fuel and hence cost of transport
  - Allows door to door transport between Thailand and MM /KH

- Gives Local operators a larger stake in cross border operations
- Helps to build local capacity to compete with other countries
- Can operate alongside CBTA Early Harvest
  - Offers more options than Early Harvest does
- Gives exports better access to Thai ports
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Eliminates expensive transloading
Articulated semi trailers

- Ideal for carrying FEU containers
- Ideal for cross border operations
- Can swap trailers or containers at border
- Quicker turn around
- Can use different trailer types
- Higher horse power tractors burn less fuel
- Less fuel burn than 12 w rigid
- Tractor interchange < 5min
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3 Tons Lighter than Container + Trailer
Curtain-sider... much lighter
Tri axle Curtain-sider ... ideal for volume cargo
12 Wheelers standard in Myanmar
12 Wheelers

- Cannot (legally) carry FEU containers
- Need labour intensive transshipment
- Best used as side loaders
- Designed for high volume – low weight
  - Built for high value and air freight
  - Design payload is 10 to 13 tons… depending on wheels
- Twin steer 2\textsuperscript{nd} axle hard on tyres and maintenance
- Hard on fuel when heavily loaded
- Already done 6 years plus when imported
- Long second life if well maintained
- High tech maintenance skills needed for newer vehicles
- Many converted from right hand drive .. locally (not factory)
Semi trailers - Common vehicle across EWEC
2\textsuperscript{nd} Hand Imports
Vehicle fleets in GMS

- Oldest in Myanmar and Cambodia, then Lao PDR
- More than 50% of CLM trucks, built last century
- Most came 2nd hand from Japan as they were available
- 12 wheeler designed for Japanese conditions
- Owners do not keep proper records or depreciate assets
- Poor vehicle utilisation means no incentive to invest.
- Finance of vehicles very hard. Need property assets
- No proper business plans to build finance case
# Diesel fuel emissions

<table>
<thead>
<tr>
<th>Date</th>
<th>Stage</th>
<th>NMHC</th>
<th>CO</th>
<th>NOX</th>
<th>PM</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>Euro 3</td>
<td>0.78</td>
<td>5.45</td>
<td>5.00</td>
<td>0.16</td>
</tr>
<tr>
<td>2005</td>
<td>Euro 4</td>
<td>0.55</td>
<td>4.00</td>
<td>3.50</td>
<td>0.03</td>
</tr>
<tr>
<td>2008</td>
<td>Euro 5</td>
<td>0.55</td>
<td>4.00</td>
<td>2.00</td>
<td>0.03</td>
</tr>
<tr>
<td>2013</td>
<td>Euro 6</td>
<td>0.16</td>
<td>4.00</td>
<td>0.46</td>
<td>0.01</td>
</tr>
</tbody>
</table>

CO: carbon monoxide  
g/kWh: grams per kilowatt-hour  
HC: hydrocarbons  
NMHC: non methane hydrocarbons  
NOX: nitrogen oxides  
PM: particulate matter
Newer Trucks

- Not only good for the environment as they have less emissions

- Great for the economy!

- New trucks burn less fuel as well as cleaner fuel

- Newer bigger trucks do less road damage as they have more axles

- They carry more cargo per trip

- Means better utilisation and less traffic going forward.
Less weight – less fuel - swap tractor at border

Same trailer from BKK to SIN
# Fuel burn

<table>
<thead>
<tr>
<th>Age</th>
<th>Capacity Ton</th>
<th>Annual ton km per truck</th>
<th>Fuel burnt in 50,000 km</th>
<th>Fuel burn km/litre</th>
<th>Fuel Burn Ton / km</th>
<th>HP</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>12-wheeler</td>
<td>15</td>
<td>750,000</td>
<td>25,000</td>
<td>2</td>
<td>0.033</td>
</tr>
<tr>
<td>10</td>
<td>12-wheeler</td>
<td>15</td>
<td>750,000</td>
<td>22,727</td>
<td>2.2</td>
<td>0.030</td>
</tr>
<tr>
<td>5</td>
<td>12-wheeler</td>
<td>15</td>
<td>750,000</td>
<td>20,000</td>
<td>2.5</td>
<td>0.027</td>
</tr>
<tr>
<td>0</td>
<td>Semi-trailer 22 wheels</td>
<td>20</td>
<td>1,000,000</td>
<td>15625</td>
<td>3.2</td>
<td>0.016</td>
</tr>
<tr>
<td>0</td>
<td>Semi-Trailer</td>
<td>25</td>
<td>1,250,000</td>
<td>16,666</td>
<td>3.0</td>
<td>0.013</td>
</tr>
<tr>
<td></td>
<td>Semi-trailer</td>
<td>30</td>
<td>1,500,000</td>
<td>20000</td>
<td>2.5</td>
<td>0.013</td>
</tr>
<tr>
<td>5</td>
<td>Semi-trailer</td>
<td>20</td>
<td>1,000,000</td>
<td>18518</td>
<td>2.7</td>
<td>0.019</td>
</tr>
</tbody>
</table>
## Comparing fuel burn

<table>
<thead>
<tr>
<th>Age</th>
<th>Tractor / trailers</th>
<th>500 @ 50,000 km</th>
<th>Fuel KM/L</th>
<th>Litres</th>
<th>Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>12-wheeler</td>
<td>25,000,000</td>
<td>2.0</td>
<td>12,500,000</td>
<td>Base</td>
</tr>
<tr>
<td>10</td>
<td>12-wheeler</td>
<td>25,000,000</td>
<td>2.2</td>
<td>11,363,637</td>
<td>-</td>
</tr>
<tr>
<td>5</td>
<td>12-wheeler</td>
<td>25,000,000</td>
<td>2.5</td>
<td>10,000,000</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>Semi-trailer 20 T</td>
<td>25,000,000</td>
<td>3.2</td>
<td>7,812,500</td>
<td>37.5 %</td>
</tr>
<tr>
<td>0</td>
<td>Semi-trailer 25 T</td>
<td>25,000,000</td>
<td>3.00</td>
<td>8,333,333</td>
<td>33 %</td>
</tr>
<tr>
<td>0</td>
<td>Semi-trailer 30 T</td>
<td>25,000,000</td>
<td>2.7</td>
<td>10,000,000</td>
<td>20 %</td>
</tr>
<tr>
<td>5</td>
<td>Semi-trailer 25T</td>
<td>25,000,000</td>
<td>2.7</td>
<td>9,259,259</td>
<td>26 %</td>
</tr>
</tbody>
</table>
Economic Benefits

• Improving the supply chain for products that require specialist and temperature sensitive handling will create trade that does not currently exist due to high costs and unacceptable levels of wastage.

• Reduced cost per ton kilometre by the use of higher capacity vehicle with lower running costs. A semi-trailer can carry up to 30 tons (normally 25) by using an integral trailer. This is up from 20 tons using a sea freight container and up from 15 using a 12-wheeler.

• Semi trailers can expect to get 3 to 3.2 kms per litre of fuel compared with 2.3 to 2.5 with a 12-wheeler. This is an increase of up to 20% for higher capacity vehicles.

• Border transhipment costs would go as there would be no need. The trailers can be swapped within 10 minutes and there is no waiting in line for the transhipment of containers or for the manual labour to be available. The risk of pilferage and damage is also taken out.
Cheaper transport costs

- 3 tons + reducing in vehicle TARE weight
  - Using integral trailers
- Reduced fuel burn …3 tons less iron to carry
- 18 – 20 % more volume inside
- Less cost per ton / km
- Not transhipments costs
- Reduced transit times
  - 10 minutes to swap trailer
  - 1 hour to swap containers…. Depending on the queue
  - 4 hours to transship manually.. Another queue
Specialist Trailers

- Refrigerated trailers preserve the cold chain
  - Frozen one way
  - Fresh fish the other way
- Industrial gas tankers .. Makes cross border possible
- Cement carriers
- Fly-ash tankers
- LNG tankers
- Fuel tankers
- Inter-factory movements

All open up more possibilities for cross border trade
Manual transshipments costs time and money.
More regional integration reduces redundant infrastructure investments

Step 1: Manual transshipments
Step 2: Exchange of trailers
Step 3: Exchange of containers
Step 4: Free flow of trucks

Regional cooperation and integration
Investment in redundant physical infrastructure
JICA has predicted transport demand to grow as follows:

- 2015 was 52.9 billion ton / kilometres
- 2030 to be 158.4 billion ton / kilometres
- Annual growth rate of 7.6%
- A 3-fold increase from 2015 to 2030

For trucking alone, even with the rehabilitation of the railway, JICA predicts that a 71% share of domestic transport will move by road in 2030.

- 2015 domestic trucking 58 million tons
- 2030 domestic trucking 200 million tons
## Cross border demand
in 000s of tons per day 2030

<table>
<thead>
<tr>
<th>Location</th>
<th>Direction</th>
<th>Moderate case</th>
<th>High Demand</th>
</tr>
</thead>
<tbody>
<tr>
<td>China Border</td>
<td>On the way</td>
<td>Ex China</td>
<td>23</td>
</tr>
<tr>
<td></td>
<td></td>
<td>To China</td>
<td>81</td>
</tr>
<tr>
<td></td>
<td>At the border</td>
<td>From China</td>
<td>26</td>
</tr>
<tr>
<td></td>
<td></td>
<td>To China</td>
<td>84</td>
</tr>
<tr>
<td>Thailand Border</td>
<td>On the way</td>
<td>From Thailand</td>
<td>105</td>
</tr>
<tr>
<td></td>
<td></td>
<td>To Thailand</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td>At the border</td>
<td>From Thailand</td>
<td>64</td>
</tr>
<tr>
<td></td>
<td></td>
<td>To Thailand</td>
<td>47</td>
</tr>
<tr>
<td><strong>Total Tons</strong></td>
<td></td>
<td></td>
<td>469,000</td>
</tr>
<tr>
<td><strong>Trucks @ 15 tons</strong></td>
<td></td>
<td></td>
<td>31,266</td>
</tr>
<tr>
<td><strong>Trucks @ 20 tons</strong></td>
<td></td>
<td></td>
<td>23,450</td>
</tr>
</tbody>
</table>
Ports and Cross-Border Points offers the most cargo volume growth

Under the JAICA high growth scenario, sea and land cargo flows are expected to reach 177 MT by 2030 from 39 MT in 2015, with a preeminence of Yangon ports under case A and a dominance of CBP Thailand and CBP China under Case B.

Cargo Flow Year 2015: 39MT

- CBP Thailand: 1.8 MT (5%)
- CBP India: 0.1 MT (0%)
- CBP China: 9.4 MT (24%)
- South Ports: 3.4 MT (9%)
- West Ports: 0.2 MT (0%)
- Yangon/Thilawa Ports: 24.3 MT (62%)

High Growth 2030: 177MT

- CBP Thailand: 16.0 MT (9%)
- CBP China: 58.5 MT (33%)
- CBP India: 2.3 MT (1%)
- South Ports: 13.8 MT (8%)
- West Ports: 0.2 MT (0%)
- Yangon/Thilawa Ports: 84.9 MT (48%)

Year 2030: Case A

Year 2030: Case B

The current trade pattern indicates a preeminence of Yangon ports in cargo flows, while CBP share is dominated by trade with China and Thailand.

Source: JAICA Research Study
Myanmar trucking industry

• Average vehicle age highest in GMS 15 to 20 years
• 12 wheel rigid vehicle dominate
• Burn more fuel than newer tractor / trailers (semi trailers)
• 12 wheeler carries 15 tons
• Semitrailers carry up to 30 tons

• Old 12 wheeler does 2 km per liter
• New Semi trailer will do 3 -3.2 km per liter
Number of Semi trailers Projection

Number of Trucks

- 2017: 12812
- 2020: 17000
- 2025: 25000
- 2030: 30000

MMRD Research Division
How would it work

- Regulations
- Responsibility
- Temporary entry
- Customs
• **Mutual recognition**
  - Trailers must be registered and legal in home country
  - Similar to ASEAN & GMS regulations
• **Host country haulier**
  - Responsible for the foreign trailer at all times
  - Must check condition of trailer on take over
  - Liable for condition of equipment and insurance
• **Operation**
  - Must run to local weight limits of host country
  - Allowed in for up to 30 days without permit
  - Always the responsibility of host transport company
Foreign Trailers

➢ Host country tractor units to be allowed to pull trailers from other GMS countries while on their own territory

➢ Permit properly registered trailers to enter for up to 30 days

➢ Seek reciprocal arrangements under bi-lateral agreements

➢ Trailer to be the responsibility of the traction company

➢ Trailer must be properly registered in country of origin
Entry into Host Country

- Limited to 30 days
- Must remain with host haulier …who picked it up
- Must be inspected and signed for by host company / driver
- Host company has a commercial agreement with sender
  - Paid by km or
  - Paid by trip or
  - Revenue share or
  - Other commercial agreement
Responsibilities

- **Private sector operators** will be liable for the condition and roadworthiness of the visiting trailer.

- They would be responsible for inspecting the trailer on hand over and signing for the condition of the trailer. Any subsequent fault found in the trailer would be their responsibility.

- They would need to have a commercial relationship with the owner of the trailer in the origin country to cover condition and repairs to the visiting equipment.
1. Trailer details

<table>
<thead>
<tr>
<th>Trailer number</th>
<th>Trailer owner / operator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trailer axles</td>
<td>wheels</td>
</tr>
</tbody>
</table>

**Trailer type:**
A) Flat trailer Container chassis (with / without container)
B) High-sided open-top
C) Tilt or curtain-side
D) Box-van
E) Reefer / reefer container on chassis
F) Tanker
G) Other (please specify)……………………………………..

**Trailer en route from (city)** ………………..**to (city)**……………………………………
**Trailer running empty?** .............................or **Loaded?**
……………………………………………………

**Company taking over the trailer**………………………………

**Rep**…………………………………………..**position**…………………………….

**Tel #**………………………………

**Taking over from Company**………………………………

**Rep**…………………………………………..**position**……………………………..
<table>
<thead>
<tr>
<th>Item</th>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Trailer / container/ accessories</strong></td>
<td></td>
</tr>
<tr>
<td>Tyres</td>
<td></td>
</tr>
<tr>
<td>Should have tread over the whole surface and no visible damage.</td>
<td></td>
</tr>
<tr>
<td>Spare tyre</td>
<td></td>
</tr>
<tr>
<td>How many? 1? Condition as above?</td>
<td></td>
</tr>
<tr>
<td>Air hoses</td>
<td></td>
</tr>
<tr>
<td>Connection type?</td>
<td></td>
</tr>
<tr>
<td>Function when connected?</td>
<td></td>
</tr>
<tr>
<td>Electrical connections</td>
<td></td>
</tr>
<tr>
<td>Lights function when connected?</td>
<td></td>
</tr>
<tr>
<td>Lights on trailer</td>
<td></td>
</tr>
<tr>
<td>Fitted with correct coloured covers?</td>
<td></td>
</tr>
<tr>
<td>Function when activated?</td>
<td></td>
</tr>
<tr>
<td>Trailer brakes</td>
<td></td>
</tr>
<tr>
<td>Function when connected?</td>
<td></td>
</tr>
<tr>
<td>Landing gear – trailer legs</td>
<td></td>
</tr>
<tr>
<td>Damaged or bent in any way?</td>
<td></td>
</tr>
<tr>
<td>Wind up – down as required?</td>
<td></td>
</tr>
<tr>
<td>Any damage visible on trailer and/or container?</td>
<td></td>
</tr>
<tr>
<td>Tarpaulin</td>
<td></td>
</tr>
<tr>
<td>Distinguishing marks/ colour/company brand?</td>
<td></td>
</tr>
<tr>
<td>Intact? Holes/tears?</td>
<td></td>
</tr>
<tr>
<td>Ropes / lashings</td>
<td></td>
</tr>
<tr>
<td>Number and type used?</td>
<td></td>
</tr>
<tr>
<td>Curtain sides</td>
<td></td>
</tr>
<tr>
<td>Intact? Any holes/ tears?</td>
<td></td>
</tr>
<tr>
<td>Soft top on trailer/container</td>
<td></td>
</tr>
<tr>
<td>Any holes/tears?</td>
<td></td>
</tr>
<tr>
<td>Container on the trailer</td>
<td></td>
</tr>
<tr>
<td>Container number?</td>
<td></td>
</tr>
</tbody>
</table>
Customs Options

• Registration system similar to Containers

• Carnet de passage en douane
  • Establish system used for decades; similar to ATA carnet
  • Similar to vehicle passport system
  • Stamped in and out of countries

• Electronic tracking
  • Use GPS tags on trailers
  • Fitted at border of entry
  • Taken of on departure
  • Visible on line at all times
Summary

- There is ongoing resistance to the full implementation of the CBTA. The transport sectors of the GMS countries are not equal in terms of capacity and the ability to compete with one another.

- This lack of implementation is restricting cross border trade and not allowing it to open up to its full potential. Allowing trailers to be swapped at the frontier and hauled by local tractor units will not usurp the CBTA, it will offer a half way alternative for those that are unable of unwilling to move toward the full implementation and opening up of cross border transport and allowing foreign trucks on to their territory.

- It will build local capacity while promoting trade in areas that have previously not been easy to develop due to handling issues. It will reduce the costs for those than embrace the use of integral trailers and move away from the outdated use of sea freight containers on land only movements.
Summary

• More products moving and a reduction in transport costs and transit times while building capacity in the lesser developed transport markets can only be seen a positive move in trade facilitation.

• A move to lighter trucks means fuel and emissions savings on a ton/kilometre basis by reducing the unladen weight of vehicles.

• Many more transport linkages become possible when the need for border transhipment is removed. Aside from the cost reduction, the move to trailer swapping will create trade linkages that were not previously practical.
Thank you for your attention

Can be shipped unaccompanied - Swap tractor at Ferry or Border