New Ideas for IR Growth Reducing Unit cost of Transportation

First ISO Double Stack Container train 23rd March 2006

Dubble Stack Train Entering Botad Yard No. 1

First Double Stack Dwarf Container train 7th July 2018

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Scope of Discussion

1. Proliferation of Double Stack Dwarf Container (DSDC) train operations :150 MnT .

2. Diversion of LTL cargo, Parcel, E – commerce , from Rail to Road: 100 MnT Concept of Unitization of LTL Cargo

3 Save $300 per EXIM container

4. Bulk Transportation of food grains using Dwarf Containers .

5. Efficient Way for transportation of Auto Mobiles .

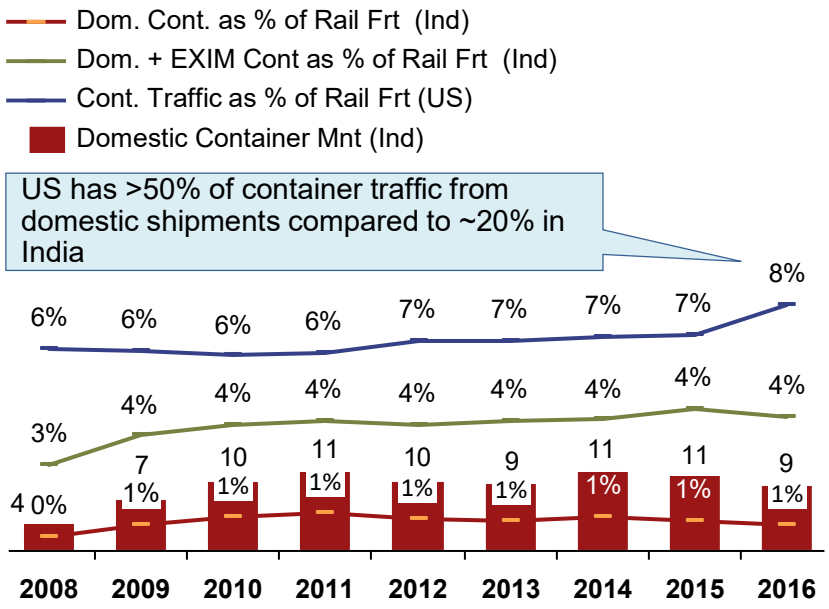
6. Alternate System of Brake Van for Container trains
7. Bulk Transportation of flyash, cement, minerlas using BRN wagons

Pvt Investment : 60000 Crs

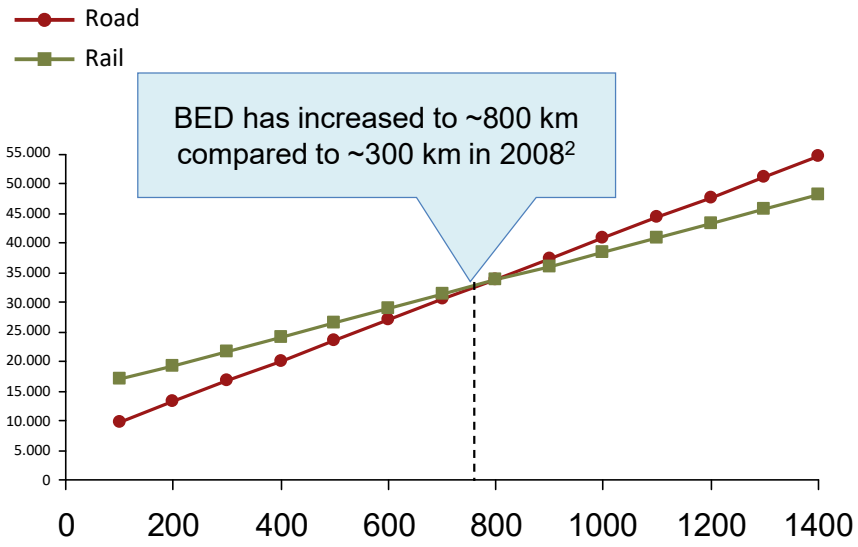
Additional Rev : 48000 Crs per annum

Domestic containers form <1% of IR's freight; roads are cheaper upto a distance of 800 kms..

Container Freight



Price comparison – box type trucks[1] v/s rail container movement *(₹/TEU)*



Highlights

- **BED has jumped to 779 km from 307 km** (in 2008) signifying greater increase in rail tariffs compared to road transport cost
- **Average lead distance for domestic container movement is 1371 km which is much higher than the break even distance**.
- Intermodal freight comprises 10% traffic for US railroads but provided 20 – 25% of revenue

1. 25 MT Box Type Trucks/ closed body trucks
2. Total Transport study by Planning Commission and RITES, 2008

Source: Indian Railways Key Statistics 2015-16, Association of American Railroads website (aar.org) , Primary interviews, A.T. Kearney analysis

Intermodal forms ~25% of US rail's revenues; double stacking & good terminals have enhanced railroads competitiveness

Benefits of double stacked containers & intermodal terminal infra in US

Highlights of double stack in US

- **Throughput doubles to 280 TEUs/ Rake**
- US Railroads **save ~40% in operating cost** with double stacking
- US Railroads have **~60% lower intermodal rates compared to 1980** (pre double stacking)
- Most of the double stacked trains are hauled by **on non-electrified lines**

IR is going for electrification on >90% of its routes which precludes possibility of double stacking of ISO containers

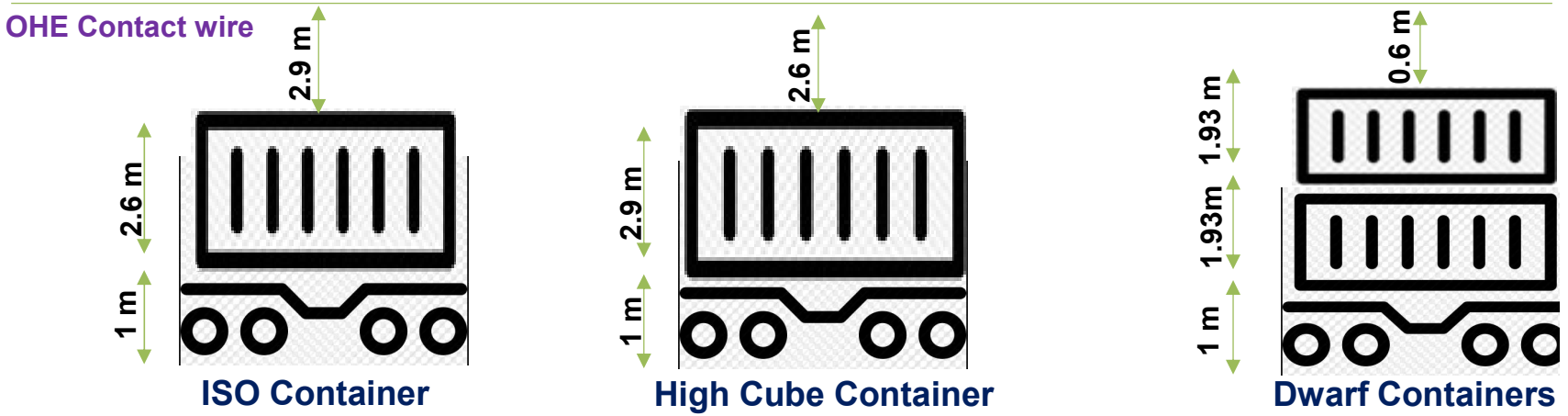
Source: Indian Railways Key Statistics 2015-16, Association of American Railroads website (aar.org - https://www.aar.org/BackgroundPapers/Rail%20Intermodal.pdf), A.T. Kearney

DESIGN FEATURES OF DWARF CONATINER

- External Dimension LxWxH : 12192 x 2600 x 1930 mm Internal Dimensions : LxWxH : 12050 x 2550 x 1812 mm
- Gross Weight 36 T Payload 32.5T :Utilize full Payload of BLCS wagons.
- Use of special corner castings in order to match the existing equipment location

Dwarf 67% higher volume v/s ISO 20ft.

Container options under OHE



	Volume (m^3/Wagon)	Volume (m^3/Rake)
8'6" Standard ISO container 20'	67	3015
9'6" HC Container 40'	76	3420
Dwarf Container – Flat Wagons	112	5040
BCN	102	4284

Clearance from OHE required for full speed operations is 0.25m and minimum clearance required is 0.2m

Ease of road transportation: Dwarf container

- **Low Height of dwarf container loaded on trailers can pass through rural, semi urban and Urban roads, through limited height subways & level crossing in electrified sections. It is not possible with ISO and Hi-cube containers.**

Features of DSDC train

- **Reduce unit cost by 30-35% compared to existing multi- modal system for light , medium heavy and heavy cargo transportation and make rail cheaper compared to road .**
- **More tonnage & Revenue than KING COAL Train (6000Tvs 4000 T)**
- **Full utilization of SOD envelop available.**
- **IR invested huge money in higher and wider infrastructure and not taking benefits due to small no of old restrictive obstructions.**
- **Very Good Equipment for Eastern & Western DFCs**
- **Very good equipment for Make In India project as China Cost is 10-12% higher**
- **Can reduce logistics cost of EXIM Containers more than USD 300 per ISO container .**

Increased volume leads to higher loadability of dwarf containers especially for low density commodities

Loadability of different container types

(Tons/wagon)

Commodity	ISO 20'	40' HC[1]	Dwarf [1]	% increase in dwarf v/s ISO 20'	% increase in dwarf v/s 40' HC
Cotton	18	21	30	68%	48%
Edible Oil	34	27	63	85%	133%
Chemicals	38	27	63	67%	137%
Fruits and Vegetables	38	27	63	67%	137%
Polymer	32	27	56	75%	107%
FMCG - Packaged Foods	48	27	63	32%	137%
Rice	50	27	63	27%	137%
Pulses	50	27	63	27%	137%
Steel	56	27	63	12.5%	137%

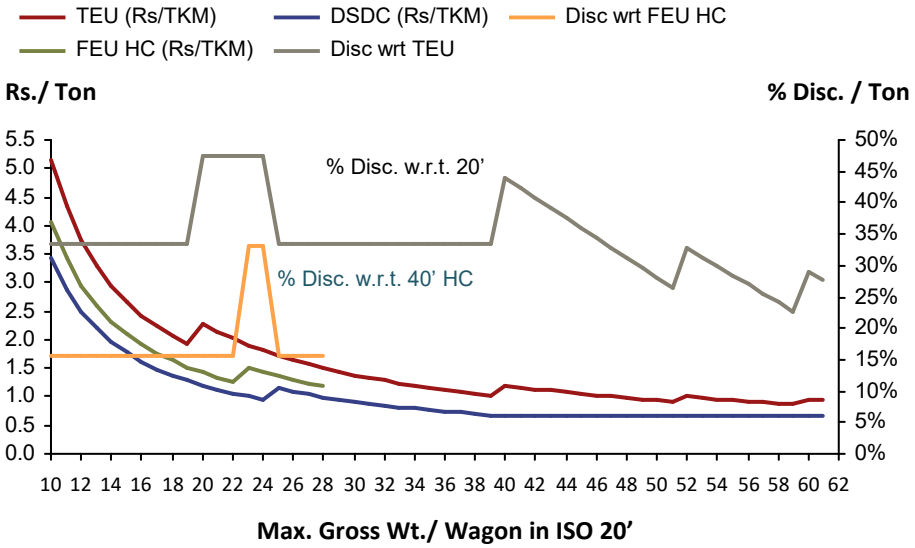
Low density commodities will have significant increase in loadability per wagon

1. % increase in loading of dwarf containers and high cube containers is based on proportional increase in volume of containers

Source: Planning commission report on containerization in 2008, ISO HC Load capacity - https://www.searates.com/reference/equipment/3/ , A.T. Kearney

IR has offered 17% discount for dwarfs, which translates to ~33% discount to shippers making IR competitive at >450 km

Discount for 40' dwarf v/s ISO containers[1]



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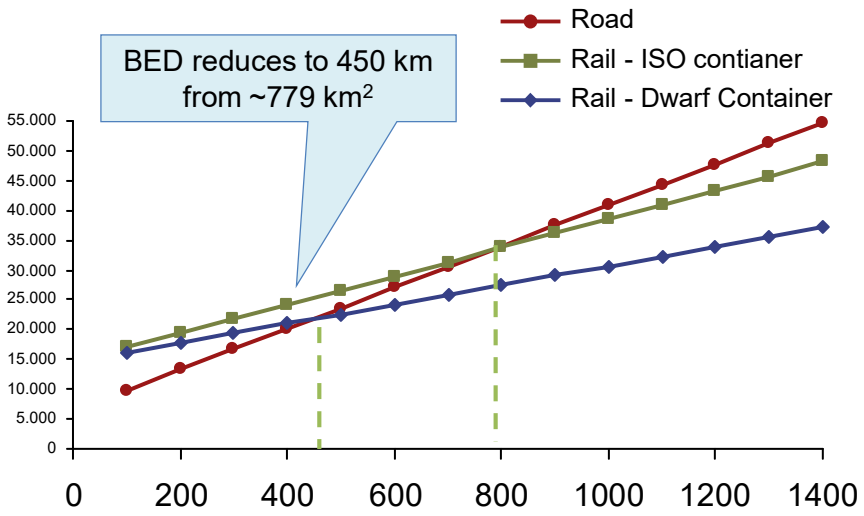
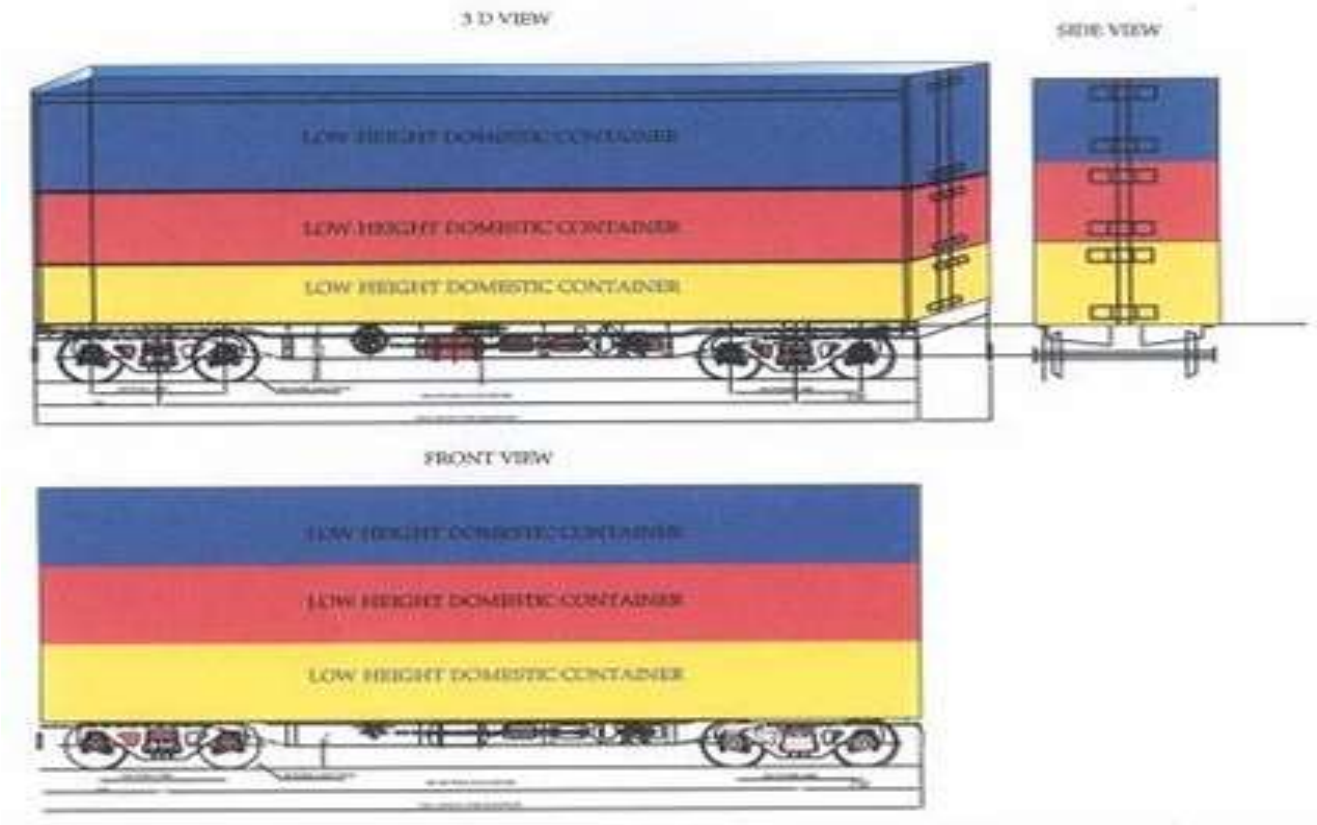


- Dwarf containers enable up to 68% higher load carriage versus standard ISO 20' containers. In order to proliferate these Dwarf Containers IR has offered 17% discount to shippers. This leads to following advantages -
  - Discount of ~33% v/s ISO 20' containers (till 40 Ton load)
  - **Additional revenue of ~12% for IR by carrying almost 70% additional load per rake (same WAG9 engine is used to haul)**

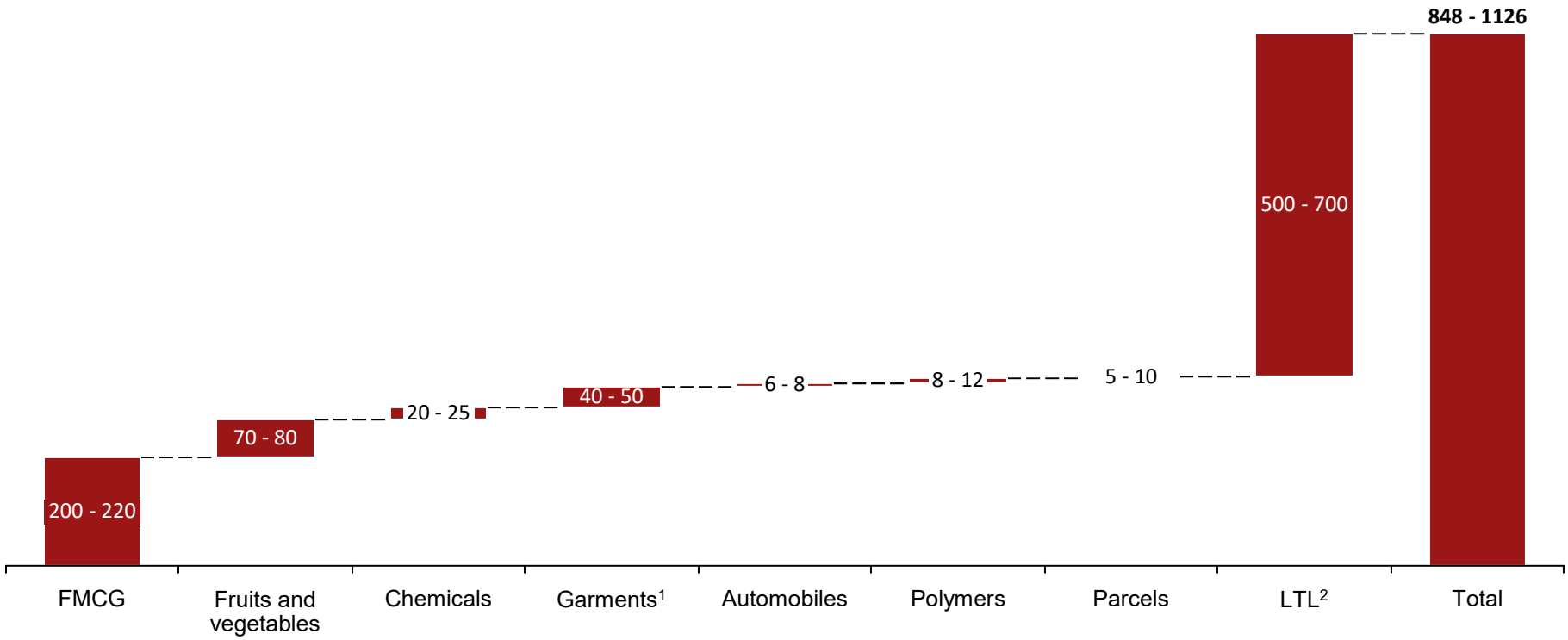
1. Using rates for 700-750 km, slab considering backhaul is available
Source: Indian Railways pricing circulars, A.T. Kearney analysis

TRIPLE STACK TRAIN WITH DWARF CONATINER ON Western DFC ROUTES



- Wagon floor height - 997 mm
- Height of container Triple stack- 6813mm against 6819 of EXIM DSC
- Will be able to utilize 25 tonnes axle load of Western DFC .

~1000 Mn ton of freight across 8 key categories exists which is suitable for containerization..

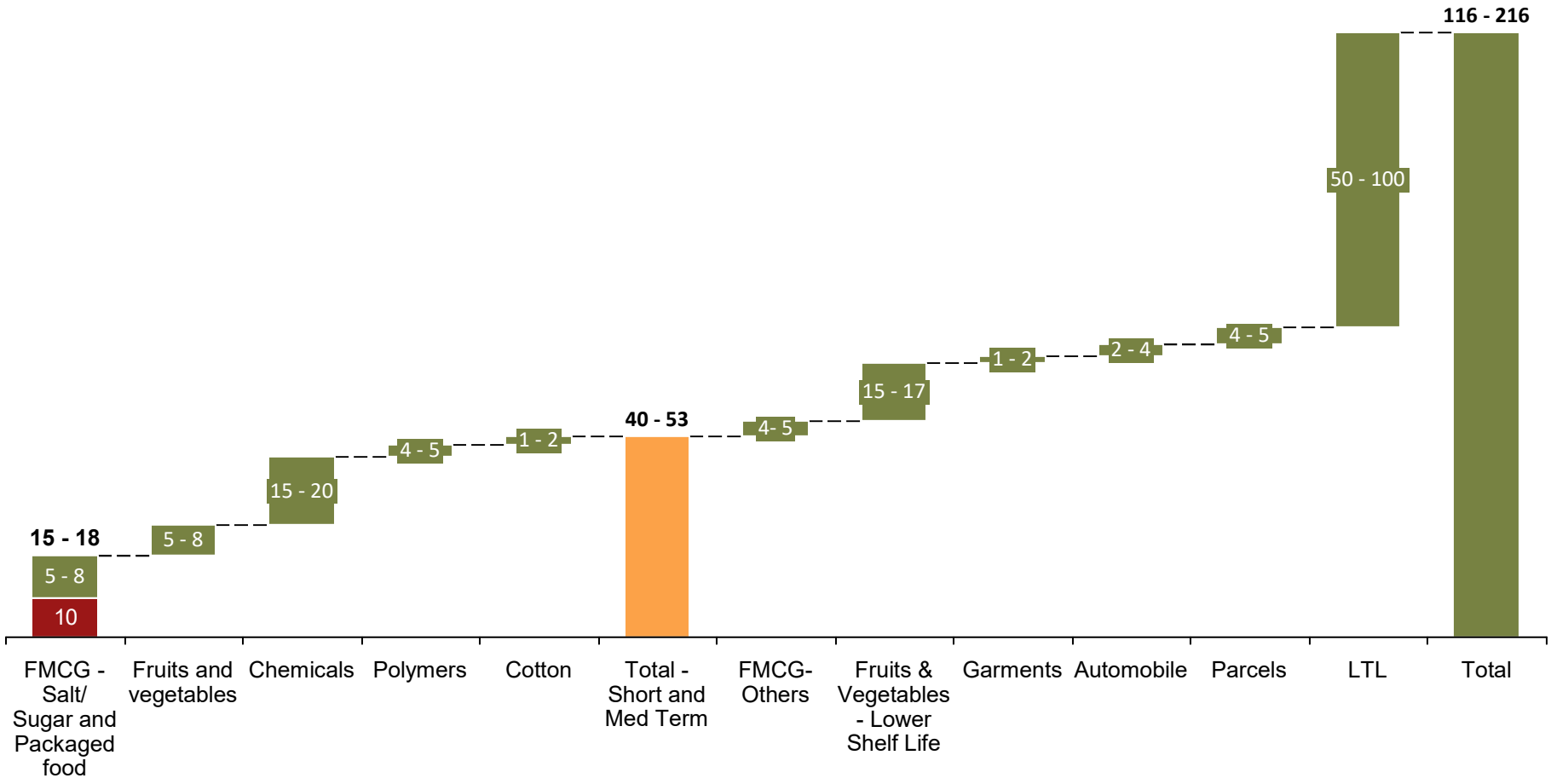


Currently, majority of this traffic moves over roads

1. Includes cotton fibre, yarn & fabric plus all garment types
2. Less than truck load market – numbers are based on expert interviews

Source: Euromonitor, Industry reports, Total Transport Study – Planning commission report 2008,

Dwarf containers have potential of 40-53 MnT in short and medium term & more than 100 MT in longer term



Source: Industry reports, Total Transport Study – Planning commission report 2008,

Latest Status

- Regular Trains from Jamnagar- NCR from 7th July 2018 . And Jamnagar- Vapi (Near Mumbai) from 6th March 2020.
- Pan India Speed Certificate has been issued by RDSO
- Routes Jamnagar- Vasai Road, Jamnagar- Hyderabad have been approved for operations recently . Routes Ludhiana- Hyderabad /Vasai Road via ADI got cleared automatically. Also NCR/ Gurgaon - Vasai Road .
- CR should examine the possibility of connecting to JNPT area .
- **Studied almost whole route profile of IR and observed following routes can be made fit within 3-4 months with insignificant investment :**
  - Delhi/NCR- Chennai/ Bangalore/ Pune/ JNPT/ Siliguri
  - Punjab/Haryana- Mumbai/ South and East sector
- Three more routes have been proposed for modification to suit DSDC
  - TKD- Chennai (2200 Kms)
  - TKD- Bangalore (2300 Kms)
  - TKD- Pune (1700 Kms)
  - These routes involve following modifications
  - Track Down by max 70 mm at 6 locations .
  - 30-40 Locations OHE to be raised to 5077 or 5147 depending upon the head room available.
  - These above works can be done departmentally with insignificant cost within a short span of one month .
  - The details where modifications required have been submitted to Railway Board
  - After commission of DFCs West -East , North - East , North- North East will get automatically connected .

Case Study : RIL Polymer cargo : 10% saving compared to road even one side loaded can be 40% cheaper if loaded both sides .

- Load 28 MT per container against 16 T in ISO 20' Container
- Train Load 2500 tonnes against 1440 hence dead weight becomes nil.
- Transportation cost including last mile is 10 % lower than road while it was 25% more in single stack, even one side loading. If both side loading is arranged the cost will come down substantially.
- 4 Million tonne of cargo can be diverted from road to rail.
- Commercial trains are running for last 17 months between Jamnagar to Ludhiana/ Rewari .

JNPT Cargo Profile FY 2019

Cluster	Unit	Cluster-wise share of ICD traffic	Cluster-wise share of (CFS +Others) traffic	Cluster-wise share of total laden traffic
Gujarat-Kutch	TEU	0%	0.0%	0%
Gujarat-Saurashtra	TEU	3%	1.3%	2%
Gujarat-South Gujarat	TEU	12%	10.0%	10%
Maharashtra	TEU	27%	48.0%	44%
MP	TEU	10%	5.0%	6%
NCR	TEU	14%	22.0%	21%
Rajasthan	TEU	1%	0.0%	0%
Punjab, Haryana	TEU	11%	4.0%	5%
South	TEU	11%	4.8%	6%
UP+West Bengal + Odhisha	TEU	12%	5.0%	6%
TOTAL	TEU	100%	100%	100%

Source : Crisil Report for JNPT 2019.
26% of NCR+ Hry+ Punjab Cargo cleared through CFS can be low hanging fruits for diversion to rail

Mundra Cargo Profile

Cluster	Unit	Cluster-wise share of ICD traffic	Cluster-wise share of (CFS + Others) traffic	Cluster-wise share of total laden traffic
Gujarat-Kutch	TEU	0%	4%	2%
Gujarat-Saurashtra	TEU	11%	11%	11%
Gujarat-South Gujarat	TEU	1%	5%	4%
Maharashtra	TEU	0%	2%	1%
MP	TEU	0%	2%	1%
NCR	TEU	18%	45%	35%
Rajasthan	TEU	10%	15%	13%
Punjab, Haryana	TEU	49%	5%	21%
South	TEU	0%	0%	0%
UP	TEU	10%	11%	11%
TOTAL	TEU	100%	100%	100%

Source : Crisil Report for JNPT 2019.

50% of NCR+ Hry+ Punjab Cargo cleared through CFS can be low hanging fruits for diversion to rail

DSDC Makes JNPT Lowest Cost V/s ISODS EX JNPT

	Between JNPT & NCR & MDPT -LDH area 1350-1400 kms							
Sr No	Description	ISO Single Stack	ISO DS Ex JNPT	DSDC Ex JNPT	TS Dwarf With 25 T axle load	Var with Single Stak	Var. with dwarf dsc	Var. with dwarf tsc
A	Combination of Loading	2 x20' at bottom	2 20' At Bottom & 1 40' top	2 40'dwarf				
1	Max gross load	2x30.5=61T	2*26+1*17 = 69 T	2*34.5= 69 T	3*27=81 T			
2	Max Cargo	2*28.0= 56 T	2*23.5+1*13= 60 T	2*31=62T	69.5			
3	Haulage Cost per wagon	68940.9	79537	56810	68417			
4	Container cost per wagon	24000	48000	6000	9000			
5	Transhipment cost	0	0	5000	7500			
	Total Cost	92941	127537	67810	84917			
6	TEUS	2	4	3.3	5			
7	**Cost Per tonne**	**1660**	**2126**	**1094**	**1370**			
8	**Cost per Teus**	**46470**	**31884**	**20425**	**16983**	**26046**	**11460**	**29487**
B	Combination of loading	1*40	2*40	2*40				
1	Max gorss load	30.5	2*30.5=61	2*34.5= 69 T	3*27=81 t			
2	Max Cargo	26.5	2*26.5=53	2*31=62T	3*23.5=69.5 T			
3	Haulage Cost per wagon	45630.27	68417	56810	68417			
4	Container cost / wagon	24000	48000	6000	9000			
5	Transhipment cost	0	0	5000	7500			
	Total Cost	69630	116417	67810	84917			
5	**Cost Per tonne**	**2678**	**2197**	**1094**	**1370**			
6	**TEUS**	**2**	**4**	**3.3**	**5**			
7	**cost per teus**	**34815**	**29104**	**20548**	**16983**	**14267**	**8556**	**17832**

DSDC Save USD 0.3 Bn/ Mn TEU throughput Create WIN :WIN:WIN for ALL stake holders

	JNPT Cargo from JNPT to NCR Assuming 1350-1400 Kms			
1	Description	ISO 20' CTNR	Dwarf CNTR	Remarks
2	Vol Equivalent	1	0.6	one 20 ' ISO is .6 Dwarf
3	Avegare per TEU of EXIM Cargo	19.5 T		
4	Haulage	30797	17111	Assuning 1 iso 20' equivalent to .6 dwarf container
5	Conatiner charges	0	2500	
6	Wagon Charges @ 3 trips per month	4150	2500	
7	Shipping Line Charges for container empty repo etc	12000	0	
8	Transhipment cost	0	2000	
9	final terminal cost	3500	2108	
	Total Cost	50447	26220	
	Total Savings for Import cycle		24227	48
	Export cycle			
	Haluage	30797	17111	
	transhipment cost	0	2500	
	terminal cost	4150	2500	
	Total cost	34947	22111	
	Saving in export cycle		12835	37
	Total cost for cycle		37062	

WIN FOR ALL

- Nation :
  i) Lower logistics cost for EXIM cargo save almost USD 300 per container
  ii) May result more competitive Exports and enhance export from India .
  iii) Dwarf is cheaper to be made in India and hence very good equipment for Make in India Rs 10000 crores manufacturing activity .

- Ports : i) Offer Lowest Logistics Cost to Shippers .
  II) Increase throughput
  III) Reduce Congestions at Gate and Road .
  Iv) Increase DPD which will further reduce cost of logistics for shippers.

- IR : i) Increased Rail Share from JNPT and other ports
  Ii) More Competitive than road even for lighter cargo.
  Iii) Increase in per train revenue for lighter cargo .
  iv) Private Investment of Rs 15-2,0000 Crores and additional revenue

- CTO :i) Increase in revenue for train 144 teus instead of 90 Teus per train .
  ii) Increase terminal efficiency as no custom activity inside the Terminals . Reduce cost of terminals significantly .

- CFS Owners : i) Can provide benefit of low haulage cost through rail to shippers.

- Shipping Lines: I) Containers being handled at Port itself. Empty Repositioning cost can be borne by shippers.
  - Ii) Improves turn around time of shipping line containers

Diversion of LTL/Parcel/E- commerce Cargo from Road To Rail : to reduce transport cost

- **LTL cargo having leads > 700 Kms is approximately 20% of total cargo moved which translate into almost 1000 Million tonne**
- **For LTL Road has also to do first and last mile operation including warehousing and multiple handling of cargo .**
- **Shorter journey with the help of smaller trucks and longer journey by big trucks.**
- **Our concept envisage unitization of this LTL cargo through smaller containers and take advantage of longer journey by train .**
- **Avoid covered warehousing and multiple handling of cargo.**
- **We have suggested two models : With Dwarf Containers from terminal to terminal and for in between hoping stations like a passenger train.**

Unitization of Less Than Truck Load (LTL) Cargo : Cheaper, Safer & Secure

- CUBOID Container LxWxH: 2.55x2.00x2.73 m
- Volume: 12.5 cum
- Payload: 2.5 MT i.e. 5 cum/ MT (Ideal for Parcel)
- Gross: 3.3 MT it can be handled by forklift of 5 MT with load center at 1.225 m.
- Very good for two-wheeler (8 motorbike per CUBOID) & three-wheeler (3 no per CUBOID) transportation along with parcel cargo.
- Longer journey through Rail gives advantage of safety, security and low cost.
- Last and first miles optimized through light commercial vehicle or 20' trucks . Best use of costly assets such as trucks , pick up truck and wagons.
- Avoid multiple handling of cargo and covered warehouses for consolidation.
- Most of handling activities are mechanized using readily available fork-lifts and reach stacker .
- Ideal equipment for least exposure in Covid-19 situation.

Complete Supply Chain for LTL cargo : Cheaper by 20-25%

First Mile

ONE CUBOID ON LCV

Three CUBOID ON 20' Truck

5 CUBOID on 33' Truck

Longer Journey by Rail Six CUBOID per BLC Wagon: 270 Cuboid / Rake

- 15 MT of Parcel Cargo/wagon, 675 MT/Rake
- 48 Motor Bike per wagon; 2160/Rake will replace 54 trucks.
- 18 three wheelers per wagon; 810per rake, can be efficient rail options for three wheelers.
- All operation by Fork-Lifts avoid costly container handling equipment and special railway yards. Although reach stacker can also be used.
- Can provide hoping facility for parcel users.

Last Mile

Arrangement for Motorbike transportation

Four Bike on a stand

6 Cuboid on one wagon i.e. 48 bike /wagon and 2160 bikes per rake For Longer Journey

Two Bike Stand in a Cuboid i.e. 8 Bike per container

5 Cuboid on 33' truck i.e 40 bike for first & last mile

Three Wheeler Loading

- 3 No three wheeler without upper body can be loaded in a COBOID
- 5 nos cuboid on a 33’ truck i.e. 15 no three wheeler can be loaded on a 33’ truck
- Six cuboid on a Wagon i.e 18 three wheelers and 810 three wheeler can be loaded.
- Presently this can be best rail solution for three wheeler transportation .
- Same Platfrom cum stand used for two wheeler can be used

Concept of Bulk Food Grainsusing Dwarf Containers

Loading in Bulk by Screw Conveyor in Dwarf Container at Grain Mandi (32.5 MT)

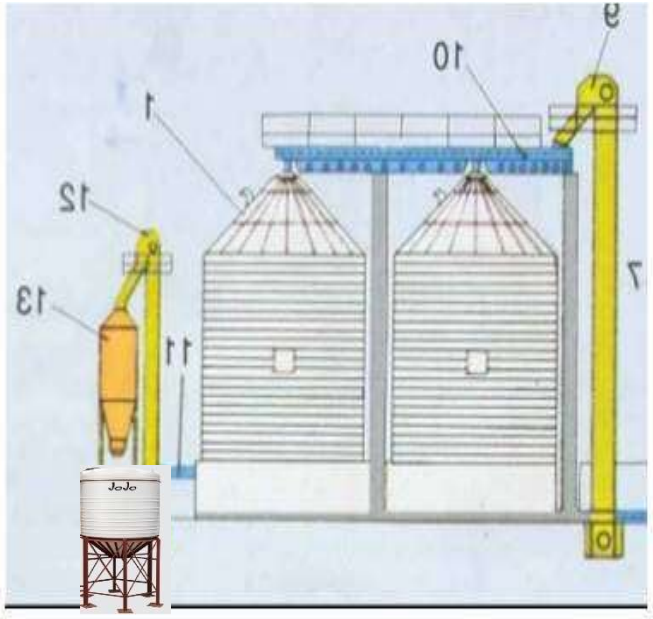
vedio 1.mp4

Unloading by Container Tilter in procuring Silos

Bulk Loading of Dwarf CTNT from Procuring SILO

Movement by Rail 3100MT

SMART SILO 4 MT to PDS Shop has automatic dispensation system connected with central server



Filling Of Smart SILO at Consuming SILO

Unloading at Consuming SILO by Tilter

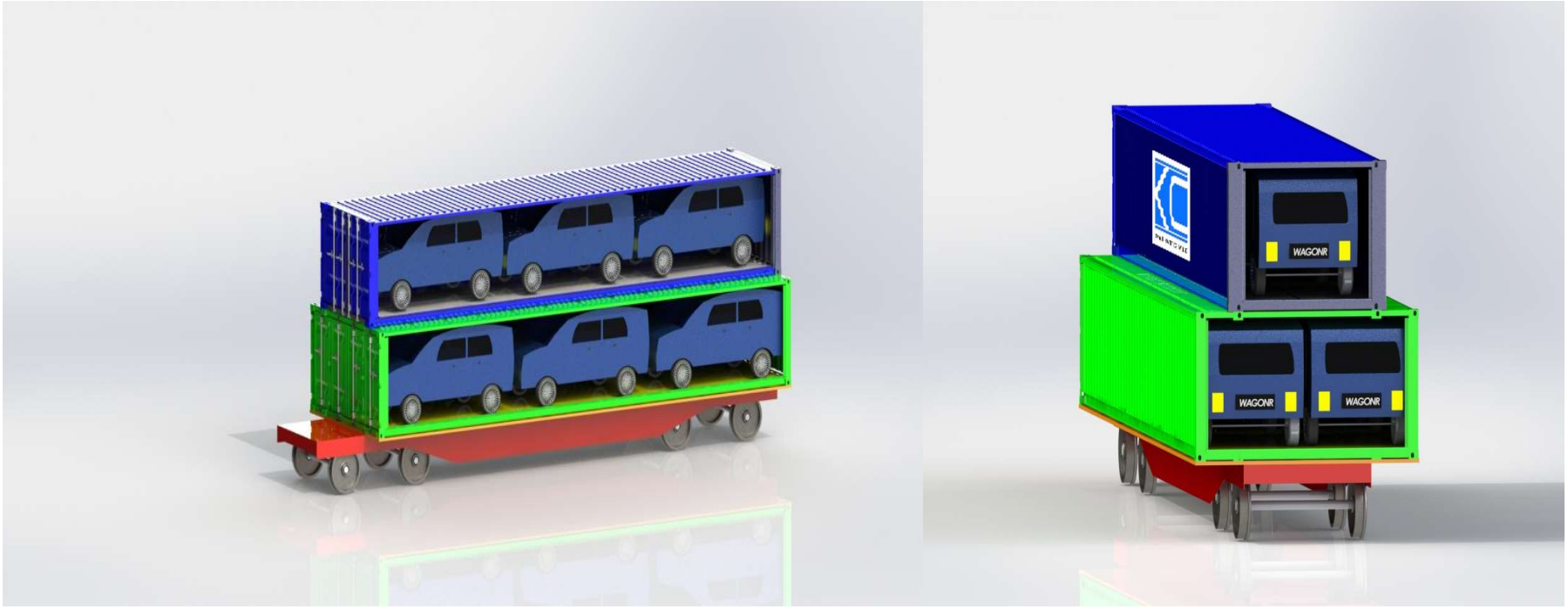
Concept of Car carrier in Dwarf Containers

Salient Feature

- Wagon remains the same BLC.
- Container same for Eastern & Western DFC only combination of containers changes . Provide full flexibility for interchange between EDFC & WDFC ,
- For DSDC routes Two types of containers .
- Provide flexibility for loading of four wheeler including SUVs, Two Wheelers , Three Wheelers, earth Movers etc.
- Light cargo upto 10 T can be loaded wherever required .
- For costing purpose most conservative option of one side loaded & one side empty is considered .
- If Some return cargo is explored than profitability increase for all IR and CTO and OEMs.

- **EDME Freight has already referred to RDSO for their Clearance** .

Super HC Dwarf + Dwarf :Fit for ALL DSDC routes

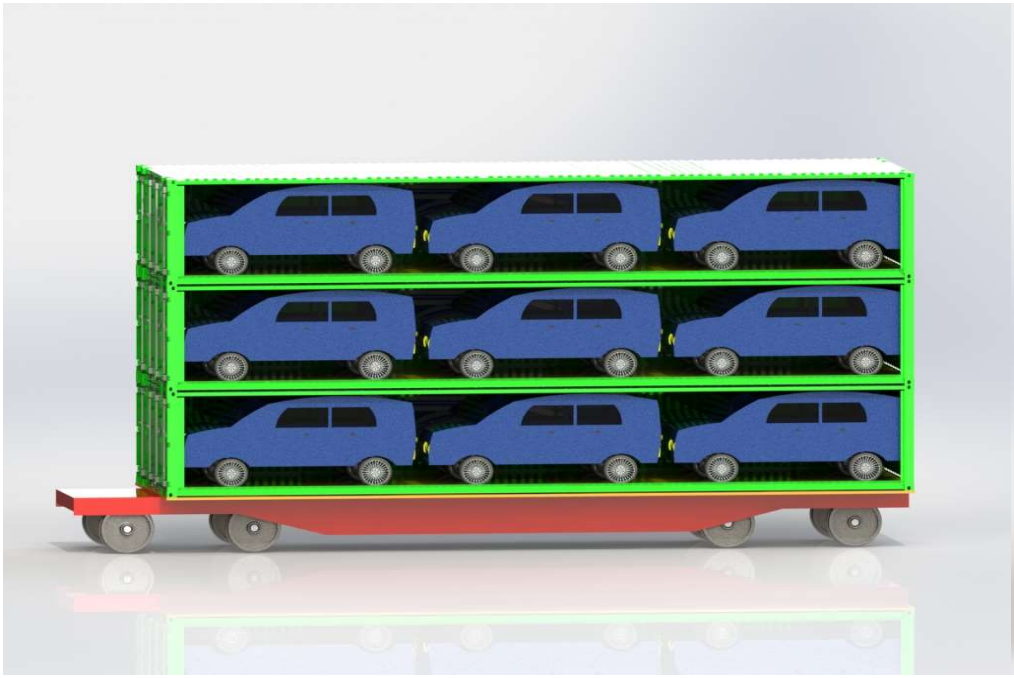


1. 10.5 Alto Equivalent/wagon in combination of 3 Etriga (1.4) + 3 Swift(1.1)+3 Alto
2. Total Alto Equivalent 472 Cars instead of 318 Increase of 48 %.
3. Two wheelers & three wheelers can be loaded in combination of auto car.
4. ALL SUV (upto 1710mm height) can be loaded

Super HC Dwarf + Super HC Dwarf for Eastern DFC

1. 14 Alto Equivalent /wagon in combination of 4 Etriga (1.4)+ 4 Swift(1.1) + 4 Alto
2. Total Alto Equivalent 630 Cars instead of 318 Increase of 98% .
3. Two wheelers & three wheelers can be loaded in combination of auto car.
4. All SUV (upto 1710mm height) cab be loaded .

3 Super HC Dwarf Container for Western DFC



1. 21 Alto Equivalent/ wagon in combination of 4 Etriga (1.4)+ 6 Swift(1.1) + 6 Alto
2. Total Alto Equivalent 945 Cars instead of 318 Increase of 197% .
3. Two wheelers & three wheelers can be loaded in combination of auto car.
4. All SUV (upto 1710mm) can be loaded

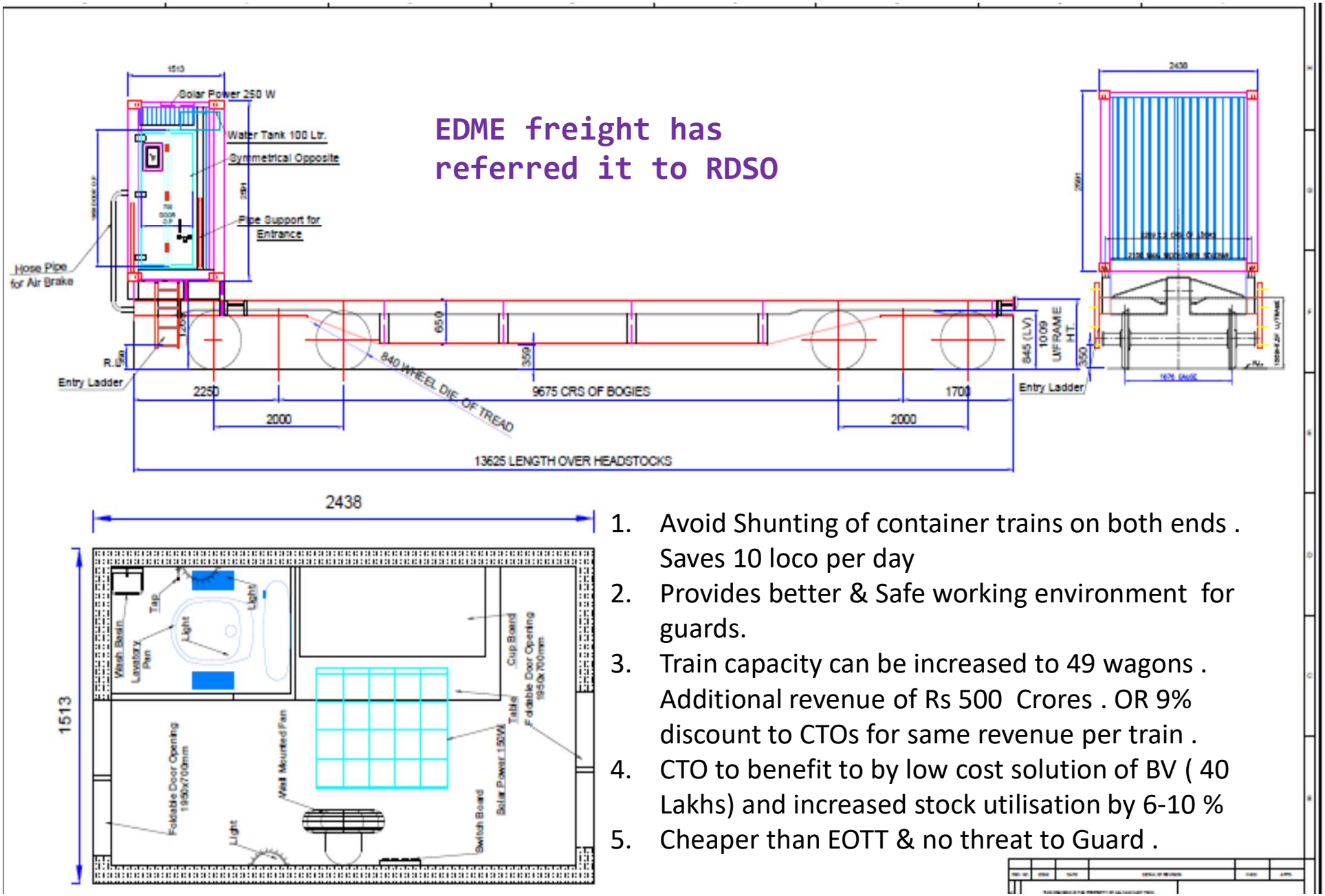
Increase in IR revenue and decrease in unit transportation cost

		For DSDC Routes	For Eastern DFC	western DFC	For All Routes
Sr	Description	Super HC Dwarf + Dwarf	Super HC Dwarf + Super HC Dwarf	3 Super Dwarf	AFTO
1	Haulage per Wagon	77027	77027	92803	98325
2	Car Alto Units	10.5	14	21	11.7
3	Per car Haulage Cost	7336	5502	4419	8404
4	No of car in a rake	472	630	945	318
6	IR Revenue per train round trip	3466193	3466193	4176136	2654779
7	Increase in IR Revenue	31	31	57	Ref
8	Haulage Cost reduction per car	13	35	47	Ref
9	Increase in thoughput	1.48 times	1.9 Times	2.97 Times	Ref
	If Revenue share is 50% between CTO & IR				
	IR Revenue per train round trip	3060486	3060486	3060486	2654779
	Per car Haulage Cost	6484	4858	3239	8404
	Halulage Cost reduction per car	23	42	61	Ref

Road Rates are Rs 14750 per ALTO CAR Equivalent

Rail rate can be cheaper by Rs 1500-2000 per car including all costs & First /Last miles by road.

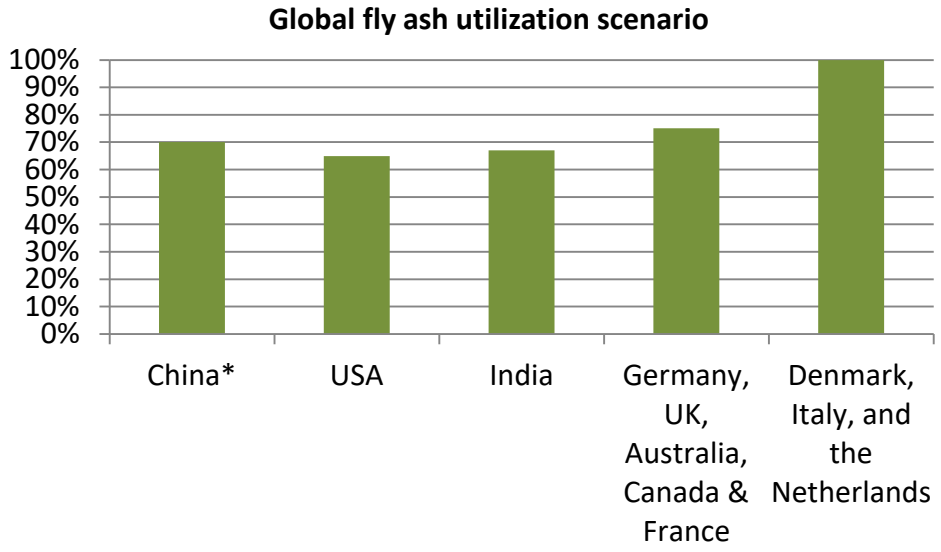
Alternative of BV for Container trains



EDME freight has referred it to RDSO

1. Avoid Shunting of container trains on both ends . Saves 10 loco per day
2. Provides better & Safe working environment for guards.
3. Train capacity can be increased to 49 wagons . Additional revenue of Rs 500 Crores . OR 9% discount to CTOs for same revenue per train .
4. CTO to benefit to by low cost solution of BV (40 Lakhs) and increased stock utilisation by 6-10 %
5. Cheaper than EOTT & no threat to Guard .

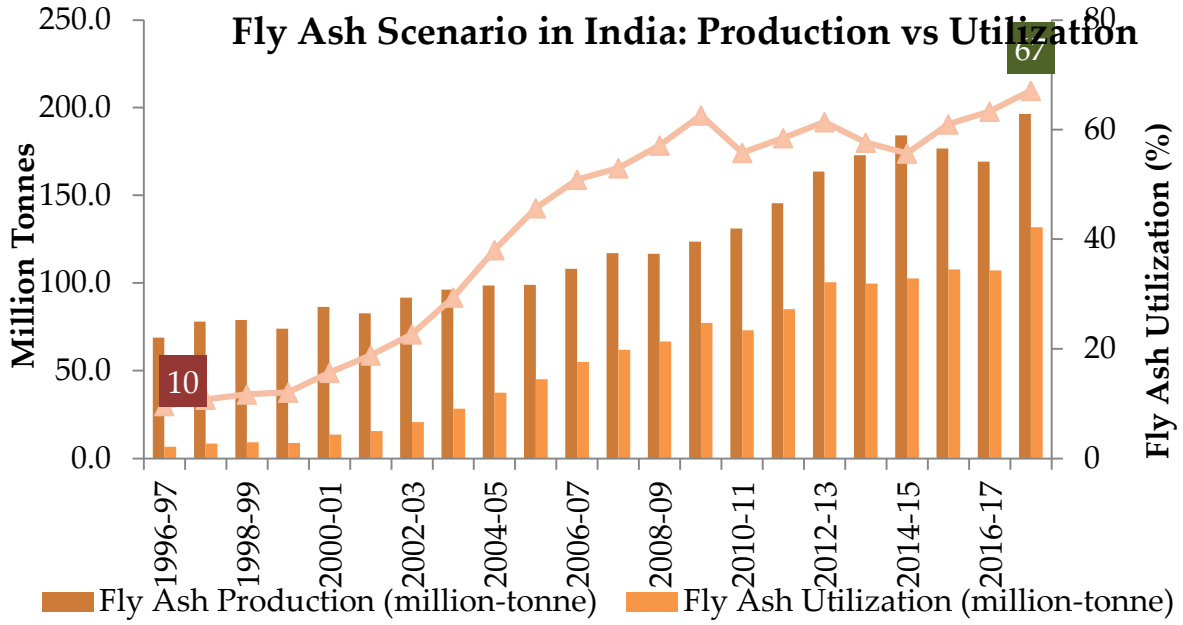
Fly ash utilization: Global scenario



Note: China (2015), USA (2017), India (2017-18), Others, 2017 ; * There are doubts about the number, Greenpeace suggests only 25% is utilized
Source: Industry sources

Fly Ash Scenario in India: Generation vs Utilization

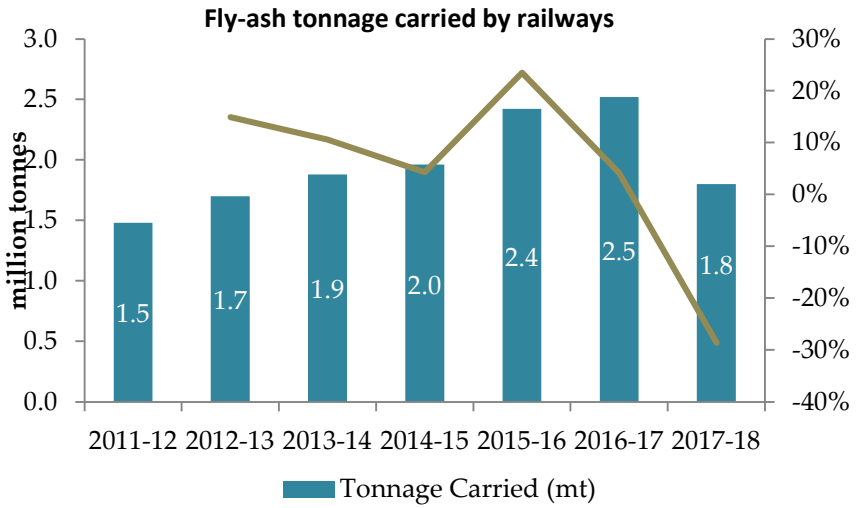
- Fly ash generation has increased from **69 mt in 1996-97** to a level of **196 mt in 2017-18**
- The utilization of fly ash has increased from **6.6 mt in 1996-97** to a level of **132 mt in 2017-18**



Source : Report on Fly Ash Generation, Central Electricity Authority (2017-18)

Fly Ash Transport by IR: Existing Scenario

Modal Share of Railways which was **1.4%** 2017-18, slightly lower than that in 2013-14



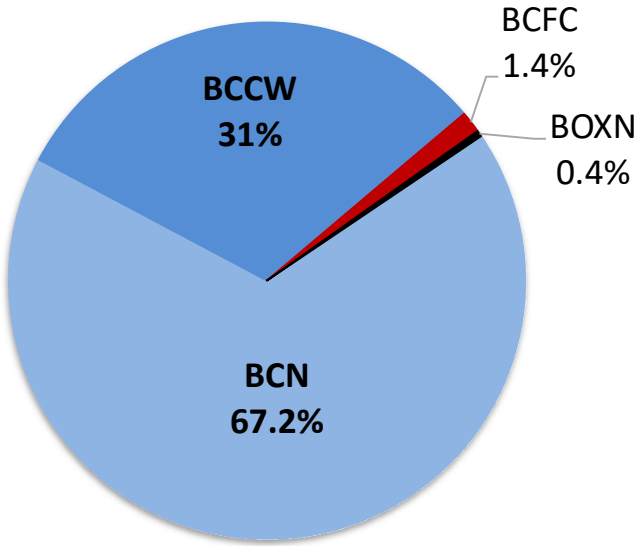
- Avg. no of Trips per Year = **679**
- Average lead = **577 km**
- Net Tonne Km's per Year = **1,151.6 million NTKM**

Source : CRIS (2017-18)

Rolling Stock – Current Status

Around 67% of total fly ash is transported in BCN wagons, where it is first bagged and then loaded in the wagons

Share of various type of wagons used in transporting fly ash via Rail



Source : CRIS (2017-18)

Salient Feature of BOX: Increase Rail Share of flyash transportation

- Size : LxWxH : 2600x2600x2600 mm
- Vol : 15.5 Cum
- Top Loading Side Discharge
- Gross Load : 13.5 T
- Max Payload: 12.5 T
- 5 Boxes per BRNA Wagon
- Wagon Loading : Gross Load 63T / Flyash 58 T
- Rake Loading : 2500 MT
- Tested and certified by Classification Society for dimensions, loading capacity , weather proofing, rail loading fitness etc.

Complete Cycle

First Mile

Loading from Vertical hopper through Gravity . The BOX opening is designed in such a manner that maximum volume is utilised

Longer journey by train

5 nos BOXES Loaded on BRNA Wagon Loaded Containers can be handled with 20 t crane and empty with 2 t Fork lift

Last Mile

Unloading by tilting the container very near to SILO for storage / Consumption purpose.

Request to IR

- In principle approval for the concept
- 40% discount on flat wagon given as per latest circular should be applicable for this concept as we are using BRNA (Flat WAGON)
- Empty Haulage of the containers should not be charged upto the loaded distance.
- Assurance of at least ten years for consistence of the policy .

Tentative Financials

For 500 kms lead							
Sr No	Descritpion	BRNA with Flyash Box	BOXN with Jumbo bag	BCN with 50 Kgs bag	BTAP	BCFC	
1	Capacity per wagon	58	60	62	60	48	
2	Chargable weight	63	64	63	60	48	
3	Railway Tariff	610	610	483	610	610	
4	Tarfiff after discount	366	366	483	610	610	
5	Cost per wagon	23072	23438	30442	36622	29298	
6	Cost per tonne of flyash	398	391	491	610	610	
7	First Mile cost	100	400	400	150	150	
8	Last Mile cost	100	100	120	150	150	
9	Cost of Box/tone	60	0	0	0	0	
	Total	658	891	1011	910	910	
	Cost per tonne kms	1.32	1.78	2.02	1.82	1.82	
	Remarks	two box set per rake and 5 trips a month	First mile include cost of jumbo bag, bagging cost, tarpulin cost etc.	cost of bags , bagging cost are included in first mile			

Advantage of the system

- The multiple handling of cargo is avoided and all handing is mechanised , hence the terminal handling at both ends becomes faster, cheaper and secure . The existing system of hopper and silos can be utilised without any modification at loading and unloading site.
- These boxes has codal life of 15 years while bags are one time use only . No plastic use .
- Cement and other industries will welcome this type of system which can very well synchronised with their existing unloading arrangements.
- It qualifies all the requirements of NGT for transportation of bulk flyash .
- This is best suited for COVID time as minimum intervention of labour force.
- Avoid bagging and covered warehouse requirements .
- Will result in long term private investment in rail sector .

Private Investment & Additional Revenue to IR

DSDC Trains	Nos	Investment in Crs	Revenue In Crs
150 Million tonnes			
CTNR requirement (nos)	186000	9500	
Wagons (Rakes)	1000	1200	
			22000
Parcel			
100 million			
CTNR (Nos)	350000	9000	
Wagon (Rakes)	3400	40000	
			26000
Replacement of BV			
No fo addiotnal wagons	1800	450	480
Total		**60150**	**48480**

Request to IR : New Envelop of 5150x4200mm

1. Create an envelop of HxW: 5150x4200 mm which can allow train of 4877x3660/2600 mm .

2. Studied almost whole route profile of IR and observed following routes can be made fit within 3-4 months with insignificant investment :
   - Delhi/NCR- Chennai/ Bangalore/ Pune/ JNPT/ Siliguri
   - Punjab/Haryana- Mumbai/ South and East sector.

3. There are 17 CTOs which can act as Marketing Organization for domestic and EXIM containerisation .

4. Create Suitable environment for handling of LTL / Parcel/ E commerce cargo and time tabled parcel trains at least for Express Parcel Cargo.

5. Setting up of Multimodal Parks through PPP routes