



World Conference on Transport Research - WCTR 2019 Mumbai 26-31 May 2019

Dedicated Freight Corridor: Current Challenges

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Abstract

Indian Railways has been one of the drivers of the fast-growing Indian economy. Dedicated Freight Corridors (DFCs) were planned along the Golden Quadrilateral rail route to further this growth. In this paper, we examine the current challenges for the DFC project. The first milestone in the genesis of the DFC was the setting up of the Dedicated Freight Corridor Corporation of India Ltd. in 2006, with the expected project completion in 2011. After quite some delay, the Detailed Project Report was completed in 2014. The project is now expected to be completed by the end of 2020. We examine the scope and status of DFCs. We bring out issues like implications of design parameters, traffic projection assumptions, feeder routes, development of industrial corridors, project timeline, land acquisition, market access, etc. based on the original scope and current status of the project.

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Peer-review under responsibility of WORLD CONFERENCE ON TRANSPORT RESEARCH SOCIETY.

Keywords: Freight; logistics; railways; land acquisition; dedicated freight corridors

1. Introduction

Independence Day in 2018 made a mark in the history of Indian Railways freight movement. The day saw inauguration of the first stretch of the 3360 kilometer (km) long Dedicated Freight Corridor (DFC). The inaugural freight train was flagged off from Ateli in Haryana to Phulera in Rajasthan [Bhargava, 2018]. This, now operational, 190 km stretch is a part of the 1504 km long Western Dedicated Freight Corridor (WDFC), that shall run from Dadri in Uttar Pradesh to Jawaharlal Nehru Port Trust (JNPT), near Mumbai [DFCCIL, Western Corridor]. The Eastern Dedicated Freight Corridor (EDFC), 1856 km long, will begin from Ludhiana in Punjab and go till Dankuni, near Kolkata [DFCCIL, Eastern Corridor]. This paper reviews the status of DFC and the challenges for the way forward.

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2. Genesis of DFC

Indian Railway network, 67,368 km long, carried 1109.6 million-ton (mt) freight in 2016-17 [Indian Railways, 2017]. The share of Indian Railways in carrying freight traffic of the country dropped from 83% in 1950-51 to 31% in 2016-17 [WRI India, 2017]. The 10,122 km long Golden Quadrilateral, connecting the four metropolitan cities of Delhi, Mumbai, Chennai and Kolkata, along with its two diagonals (Delhi-Chennai and Mumbai-Kolkata) constitutes 16% of the Indian Railway (IR) network. It carried 52% of the passenger traffic and 58% of the freight traffic. Kolkata-Delhi and Mumbai-Delhi routes were highly saturated with line capacity utilization varying between 115% to 150% [DFCCIL, Background]. The Indian economy, growing rapidly, had put a great pressure on the existing rail infrastructure.

Indian economy is highly dependent on a few core sectors, namely, coal mining, power, steel, fertilizer, cement production and petroleum. These, in turn, have a greater dependence on railways. Keeping in line the importance of railways in supporting these core sectors, a target of 1850 mt freight traffic was envisaged in the Indian Railways 2020 vision document [Saxena, 2012].

Elasticity of rail demand in India is expected to be 1.2 times the GDP growth. However, in the past it has been limited, between 0.8 to 1, due to capacity constraints. This need for capacity led to the conception of DFC on the western and eastern high-density corridors. The project was announced in the Railway Budget for 2005-06. Ministry of Railway (MoR) appointed Rail India Technical and Economic Services Ltd. (RITES) in July 2005 to conduct a 'Feasibility study' and a 'Preliminary Engineering Cum Traffic Survey (PETS)' for both the corridors. Government of Japan was requested to provide technical cooperation in feasibility assessment of the project [CAG, 2015].

MoR approached the Cabinet Committee on Economic Affairs (CCEA) for approval based on the RITES Feasibility Report with an estimated cost of Rs 21,140 crore (cr). CCEA gave 'In Principle Approval' for execution of the project in February 2006 [CAG, 2015].

A Special Purpose Vehicle (SPV), "*Dedicated Freight Corridor Corporation of India Limited (DFCCIL), to undertake planning and development, mobilization of financial resources and construction, maintenance and operation of the dedicated freight corridors was incorporated as a company under the Companies Act 1956, on 30th October 2006*." The DFCCIL was set up as a public sector company under the MoR.

After submission of the PETS Report, MoR approached CCEA in February 2007 with an updated cost estimate of Rs 28,181 cr. In November 2007, CCEA gave in-principle approval [DFCCIL, Background] and directed MoR to undertake preliminary works and formulate comprehensive cost estimates and financing plans [CAG, 2015].

In consultation with Ministry of Finance (MoF), MoR prepared a financing plan based on the Feasibility Report by Japan International Cooperation Agency (JICA) and approached CCEA again in 2008 with a cost estimate of Rs 43,293 cr. However, CCEA approved the project at the earlier estimated cost of Rs 28,181 cr [CAG, 2015].

During 2010 and 2011, loan agreements with JICA (first tranche) for JPY 90 billion (b) (Rs 5100 cr) for WDFC Phase-I (Rewari-Vadodara) and World Bank for USD 975 million (m) (Rs 5850 cr) for EDFC Adaptable Program Loan (APL)-1 (Khurja-Bhaupur) were signed respectively. The first contracts were awarded for EDFC APL-1 in January 2013 and for WDFC Phase-I in June 2013. A loan agreement with JICA (first tranche) for JPY 136 b (Rs 7750 cr) was signed for WDFC Phase-II (Vadodara-JNPT and Dadri-Rewari) in March 2013. Loan agreements for USD 1100 m for EDFC APL-2 (Bhaupur-Mughalsarai) and USD 650 m for EDFC APL-3 (Ludhiana-Khurja and Dadri-Khurja) were signed in December 2014 and June 2015 respectively [DFCCIL, Background]. The JICA funding

[†] Definition of DFCCIL is taken as is from [DFCCIL, Home]

for WDFC was stepped up to Rs 38,722 cr [DFCCIL, Project Status]. The total loan from JICA and the World Bank would provide for Rs 52,347 cr [CCEA, 2015]. Phase wise cost estimates are given in Table 1.

Table 1. Phase wise cost estimates.

DFC Phase	Section	Kilometres	Original Amount	Loan	Final Loan Amount	Financier	Cost of the Project
WDFC							
Phase-I	Rewari-Vadodara	947		JPY 90 b	JPY 550 b	JICA	Rs 51,101 cr
Phase-II	Vadodara-JNPT	430		JPY 136 b	(Rs 38,722 cr)		
Phase-II	Dadri-Rewari	127					
Total WDFC		1504					
EDFC							
APL-1	Khurja-Bhaupur	343	USD 975 m		USD 2.725 b	World Bank	Rs 26,679 cr
APL-2	Bhaupur-Mughalsarai	402	USD 1100 m		(Rs 13,625 cr)		
APL-3	Ludhiana-Khurja	401	USD 650 m				
APL-3	Dadri-Khurja	46					
Railway Funded	Mughalsarai-Sonnagar	126				MoR	Rs 3679 cr
Total		1318					
PPP	Sonnagar-Dankuni	538					Rs 12,218 cr
Total EDFC		1856					
Grand Total					Rs 52,347		Rs 81,459 cr (excluding PPP)

[DFCCIL, Project Funding, Ministry of Railways, 2018 and DFCCIL, Project Phasing]

The Mughalsarai-Sonnagar section was to be funded fully by MoR. The 538 km Sonnagar-Dankuni section, added later, was to be awarded on a Public-Private Partnership (PPP) basis [DFCCIL, Project Status].

In the meantime, a Concession Agreement (CA) was signed between DFCCIL and MoR in February 2014. The CCEA approved the revised cost estimates of Rs 81,459 cr in June 2015 [CAG, 2015]. The Debt-Equity ratio for the project was originally envisaged at 2:1 [CAG, 2015] but was later made 3:1 [DFCCIL, Project Status].

3. Scope of DFC

The DFCs were launched to:

- *“Reduce unit cost of transportation by speeding up freight train operations & higher productivity*
- *Increase rail share in freight market by providing customized logistic services*
- *Segregate freight infrastructure for focused approach on both passenger and freight business of Railways*
- *Create additional rail infrastructure to cater high levels of transport demand*
- *Introduce of high-end technology & IT packing of Freight Services*
- *Introduce time tabled freight services & guaranteed transit time[†]”*

WDFC shall begin from Dadri in Uttar Pradesh and terminate in JNPT in Maharashtra, passing through Haryana, Rajasthan and Gujarat on the way [DFCCIL, Western Corridor]. The WDFC would have feeder routes serving the large Gujarat ports of Mundra, Kandla, Pipavav, Dahej and Hazira. EDFC shall run from Ludhiana in Punjab to Dankuni in West Bengal, passing through Haryana, Uttar Pradesh, Bihar and Jharkhand [DFCCIL, Eastern Corridor]. A route from Dadri would join the EDFC at Khurja. The EDFC would have feeder routes to different coal mines and thermal power plants.

[†] Objectives are taken as is from [DFCCIL, Objectives]

Out of the 3360 km of the two DFCs, 2959 km would be double track, but for the 401 km Ludhiana-Khurja section [DFCCIL, Corporate Plan]. The entire DFC would be run on electric traction. Of the 1504 km of WDFC, 1077 km would be adjacent to the IR network and 427 km as detours [DFCCIL, Western Corridor]. The additional land acquisition requirement for WDFC, primarily driven by the detours, would be 6000 hectares (ha) [DFCCIL, Project Status]. Of the non-PPP 1318 km of EDFC, 1111 km would be adjacent to the IR network and 207 km as detours [DFCCIL, Eastern Corridor]. The additional land acquisition requirement for EDFC, primarily driven by the detours, would be 4601 ha. The PPP portion would require 1118 ha [DFCCIL, Project Status].

In addition, future DFCs were announced in the Budget of 2016. These included Kolkata-Mumbai (2328 km), Delhi-Chennai (2327 km), Kharagpur-Vijayawada (1114 km) and Chennai-Goa (892 km) [DFCCIL, Corporate Plan]. A map of the consolidated DFC is given in Fig. 1.



Fig. 1. DFC Route map [Qazi and Tahlramani, 2017]

3.1 Traffic projections

The PETS Report by RITES had an assessment of traffic on the DFCs for 2021-22.

The primary traffic on the WDFC would comprise of “ISO containers from JNPT and Mumbai Port in Maharashtra and ports of Pipavav, Mundra and Kandla in Gujarat. Besides containers, other commodities moving on the WDFC would be POL, Fertilizers, Food grains, Salt, Coal, Iron & Steel and Cement.”[§] The WDFC shall cater 85.5 mt of traffic in 2021-22 [DFCCIL, Western Corridor], which will increase to 284 mt in 2036-37 [CCEA, 2015]. The expected traffic in both directions is given in Table 2.

Table 2. Traffic projections for WDFC based on RITES PETS Report (mt)

Dadri-JNPT		
Commodity	2016-17	2021-22
Food grains, Fertilizer	1.2	1.8
POL	0.3	0.5
Cement, Salt, Miscellaneous	0.4	0.8
Container (mTEUs)	1.9	2.7
Sub-Total (excluding container)	1.9	3.1
JNPT-Dadri		
Commodity	2016-17	2021-22
Coal, Cement, Iron & Steel	6.3	9.4
Fertilizer, Food grains, Salt	1.6	2.6
POL	1.0	1.5
Containers (mTEUs)	1.9	2.6
Sub-Total (excluding containers)	8.9	13.5
Total WDFC		
Excluding containers	10.8	16.6
Containers (mTEUs)	3.8	5.3
Containers (at 13 t/TEU)	49.4	68.9
Total	60.2	85.5

[DFCCIL, Western Corridor]

The EDFC is expected to handle “coal for the power plants in the northern region of UP, Delhi, Haryana, Punjab and parts of Rajasthan from the Eastern coal fields, finished steel, food grains, cement, fertilizers, lime stone from Rajasthan to steel plants in the east and general goods.”^{**} As per the RITES PETS Report, EDFC would cater 91.3 mt of traffic in 2021-22 [DFCCIL, Eastern Corridor], which shall increase to 251 mt in 2036-37 [CCEA, 2015]. The expected traffic in both directions is given in Table 3. It is interesting to note that the traffic projections for EDFC do not explicitly include container traffic though there is a mention of traffic from Logistics Parks.

[§] Traffic sources have been taken as is from [DFCCIL, Western Corridor]

^{**}Traffic sources have been taken as is from [DFCCIL, Eastern Corridor]

Table 3. Traffic Projections for EDFC based on RITES PETS Report (mt)

Ludhiana/Dadri-Dankuni		
Commodity	2016-17	2021-22
Fertilizer	0.2	0.4
Cement	0.8	1.5
Limestone for Steel Plants	5.0	5.0
Salt	0.7	1.0
Others	1.6	3.0
Logistics Parks	1.2	2.4
Sub-Total	9.5	13.3
Dankuni- Ludhiana/Dadri		
Commodity	2016-17	2021-22
Power House Coal	54.5	62.0
Public Coal	0.6	1.0
Steel	8.2	9.7
Others	1.6	3.0
Logistics Parks	1.2	2.4
Sub-Total	66.1	78.0
Total EDFC		
Total	75.6	91.3

[DFCCIL, Eastern Corridor]

Delhi Mumbai Industrial Corridor (DMIC) was planned to be developed along the WDFC (Fig. 2.). This would include the development of 24 Special Investment Regions across six states, namely, Uttar Pradesh (UP), Haryana, Rajasthan, Madhya Pradesh, Gujarat and Maharashtra [Ministry of Commerce & Industry, 2018]. Also, Logistics Parks were proposed to be set up in Delhi NCR, Rajasthan, Gujarat and Maharashtra. Increased level of industrialization is expected to generate traffic for the WDFC [DFCCIL, Western Corridor]. Similarly, Amritsar Kolkata Industrial Corridor (AKIC) would be developed along EDFC [DIPP, Annexure-III]. Together, these industrial corridors would provide additional traffic to WDFC and EDFC.

The traffic projections envisage a modal shift from roads to DFCs. This is expected to reduce the CO² emission by 457 mt in a period of 30 years [CCEA, 2015].

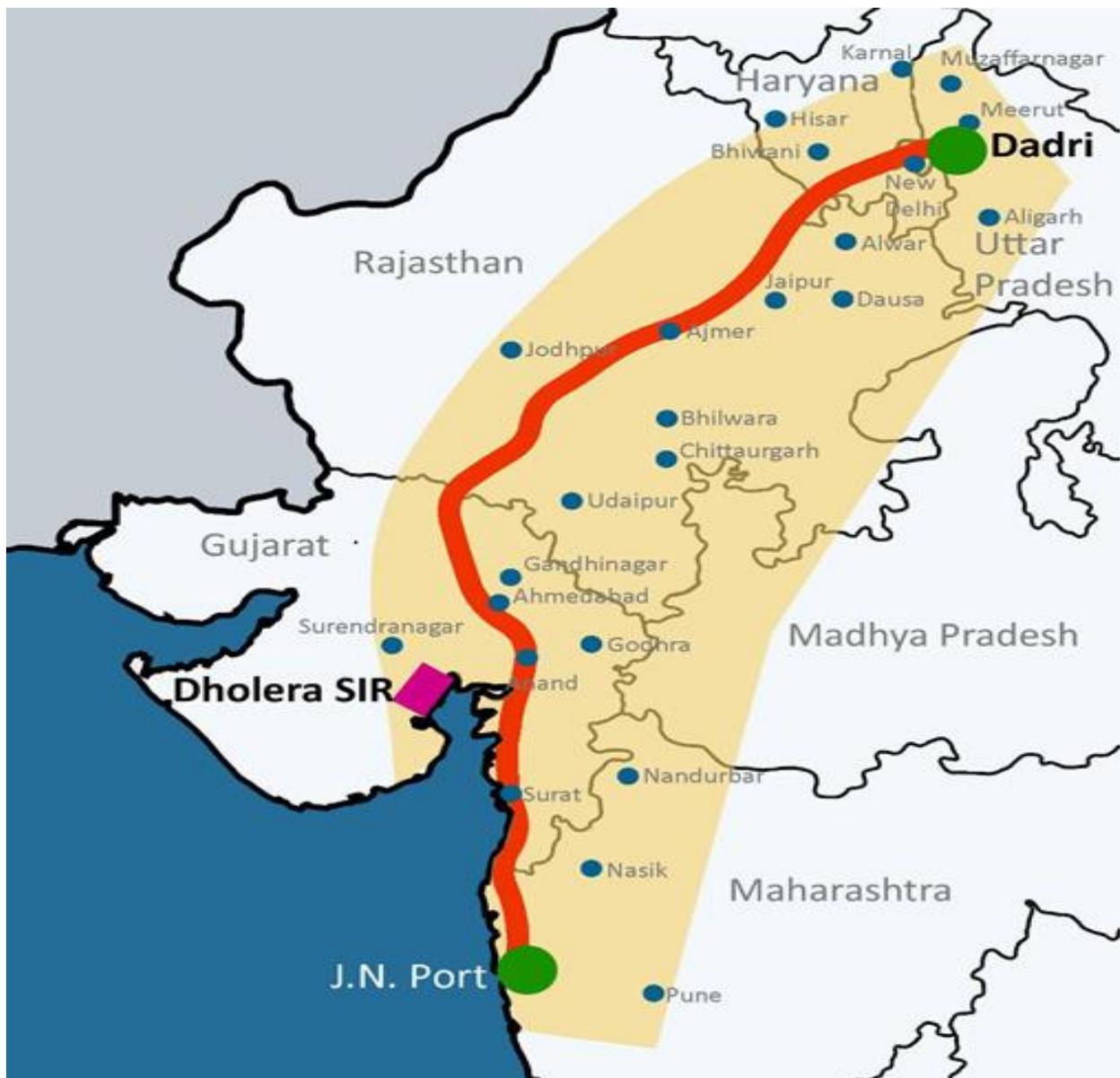
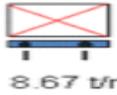
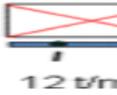


Fig. 2. DMIC along WDFC
[DIPP, Delhi Mumbai Industrial Corridor]

3.2 Design Features

In terms of technical design features, DFCs would have significant improvements over the existing railway standards to help withstand heavier loads and achieve higher speeds. Fig. 3. provides a comparison of the existing design features and standards on Indian Railways and those proposed for DFCs.

The axle loading which is currently at 22.9 tons universally and 25 tons for a few routes will become 32.5 tons on the DFCs. However, initially, the axle loading on the DFCs would be 25 tons, since the early rolling stock would only permit that. Maximum speeds which are currently at 75 kilometer per hour (kmph) would go up to 100 kmph.

Feature	Existing	On DFC
Heavier Axle Loads		
Axle Load	22.9t/25t	25 t Bridges & formation designed for 32.5 t
Track Loading Density	 8.67 t/m	 12 t/m
Maximum Speed	 75 Kmph	 100 Kmph
Grade	Up to 1 in 100	1 in 200
Curvature	Up to 10 degree	Up to 2.4 degree
Traction	Electrical(25 KV)	Electrical(25 KV AT Feeding)
Station Spacing	7-10 Km	40 Km
Signaling	Absolute/Automatic with 1 Km spacing	Automatic with 2 Km spacing
Communication	Emergency Sockets/Mobile Train Radio	Mobile Train Radio

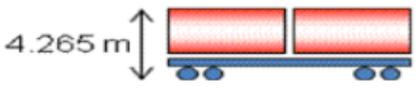
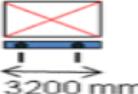
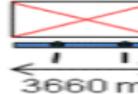
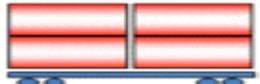
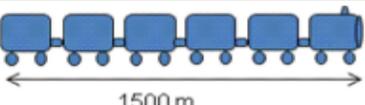
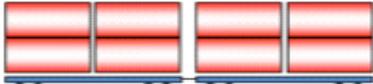
Feature	Existing	On DFC
Moving Dimensions		
Height	 4.265 m	 7.1 m for Western DFC 5.1 m for Eastern DFC
Width	 3200 mm	 3660 mm
Container Stack	 Single Stack	 Double Stack
Train length	 700 m	 1500 m
Train Load	 5,000 Ton	 13,000 Ton

Fig. 3. Upgraded Design Features of DFC
[DFCCIL, Salient Features]

Given the streamlined flow of traffic, the average speed shall increase from 26 kmph to 70 kmph [Jain, 2018]. The length of a train would increase from the current 700 meters to 1500 meters. As a consequence, a train on the DFC can carry 13,000 tons compared to a maximum 5,000 tons carried on the existing railway tracks.

In terms of organizational design, the DFCCIL SPV was under the MoR. There had been debate as to whether it should be independent of the MoR with ownership from other stakeholders. The MoR overruled this. Further, the SPV was structured in a manner that IR would be its sole customer. DFCCIL would essentially be a construction, maintenance and operating company, while IR would have the sole access to the market.

4. Status as of December 2018

4.1 Land acquisition

Up to December 2018, 98.5% of the land has been acquired for both the corridors. In the WDFC, 99.4% of the land has been acquired. In the EDFC, 97.3% of the land has been acquired for the Ludhiana-Sonnagar section and 67.8% land has been acquired for the Sonnagar-Dankuni section [DFCCIL, Project Status].

4.2 Award of contracts

97.8% contracts have been awarded. For WDFC and EDFC, all the Civil contracts have been awarded. Contracts worth Rs 52, 387 cr have been awarded for both the corridors [DFCCIL, Project Status].

4.3 Section wise progress

The section wise progress as of December 2018 is given in Table 4. The combined physical and financial progress of both corridors is 55.8% and 53.5% respectively [DFCCIL, Project Status]. As of January 2018, the figures for physical and financial progress of both corridors were 40.3% and 42.8% respectively. Details related to section wise completion targets is given in Table 5. Both WDFC and EDFC are targeted to be completed in phases by 2020 [DFCCIL, Project Status]. The first freight train was flagged off on August 15, 2018 from Ateli in Haryana. The locomotive took 3 hours 52 minutes to cover 190 km long stretch, attaining a speed of 100 kmph [Jain, 2018].

Table 4. Section wise progress as of December 2018

Section/Packages	Kilometres	Land available (%)	Affected patch/km	Physical Progress (%)	Financial Progress (%)
WDFC					
Dadri-Rewari CTP-14	127.0	98.1	1/1.247	22.0	16.0
Rewari-Iqbalgarh CTP-1&2	639.0	99.9	0/0	Civil-83.0	74.5
				System-47.0	40.5
Iqbalgarh-Vadodara CTP3 (R)	308.0	99.0	1/1.3	34.0	23.0
Vadodara-Sachin CTP-13	133.0	99.5	0/0	Civil-27.0	17.3
				System-19.0	16.0
Sachin-Vaitarna CTP-12	186.0	92.8	12/4.9	23.0	11.0
Vaitarna-JNPT CTP-11	102.0	89.2	9/12.5	11.0	6.0
EDFC					
Ludhiana-Pilkhani	179.0	100.0	0/0	31.4	27.5
Pilkhani-Khurja	222.0	91.1	2/11	9.8	5.5
Dadri- Khurja EDFC-1	46.0	87.2	6/5.03	29.0	25.5
Khurja-Bhaupur EDFC-1	343.0	99.3	3/0.21	Civil-91.0	82.2
				System-63.8	60.5
Bhaupur-Mughalsarai EDFC-2	402.0	99.7	2/2.95	Civil-48.0	43.9
				System-26.5	17.0
Durgawati-Sasaram	56.0	100.0		Ready for commissioning	
Balance portion of Mughalsarai-Sonnagar	70.0	95.5	14/9.985	50.5	44.0

[DFCCIL, Project Status]

Successful trial runs have also been conducted on 194 km long Bhadan-Khurja section of EDFC on November 30, 2018 and 306 km long Madar-Kishangarh section of WDFC on December 30, 2018. This 306 km route is inclusive of the already operational 190 km Ateli-Phulera section [IANS, 2018].

4.4 Cost

Total estimated cost of the project is Rs 81,459 cr, Rs 30,358 cr for EDFC and Rs 51,101 cr for WDFC [Ministry of Railways, 2018]. Of this, Rs 43, 607 cr has been incurred till December 2018 [DFCCIL, Project Status].

Table 5. Section wise targets

WDFC		
S No.	Section	Target
Sections planned to be completed by December 2019		
1	Ateli-Phulera (190 km)	August 2018
2	Rewari-Marwar (432 km)	December 2018
3	Marwar-Palanpur (207 km)	September 2019
Sections planned to be completed by 2020		
4	Palanpur-Makarpura (308 km)	2020
5	Makarpura-Vaitarna (313 km)	2020
6	Vaitarna-JNPT (117 km)	2020
7	Dadri- Rewari (127 km)	2020
EDFC		
S No.	Section	Target
Sections planned to be completed by December 2019		
1	Khurja-Bhaupur (343 km)	November 2018
2	Bhaupur-Mughalsarai (402 km)	August 2019
3	Mughalsarai -Sonnagar (126 km)	October 2019
4	Dadri- Khurja (46 km)	December 2019
Sections planned to be completed by 2020		
5	Sahnewal -Pilkhani (179 km)	2020
6	Pilkhani- Khurja (222 km)	2020

[DFCCIL, Project Phasing]

5. Issues

We examine the challenges of the DFC in two broad categories, with respect to scope and status.

5.1 Scope

5.1.1 Diesel vs electric traction

WDFC was initially proposed to use a diesel traction system, later it was converted to an electrified traction system after the JICA study concluded that it was more economical in the long term. However, this increased the cost as electrified traction system required a larger initial investment [JICA, 2007].

5.1.2 Double stack vs single stack

The project has adopted different technical standards for WDFC and EDFC. WDFC would have moving dimensions made for double stacked containers (7.1 meters). Moving dimensions for EDFC are being made for single stack container operations (5.1 meters) [Agrawalla and Raghuram, 2013]. This makes seamless movement of double stack trains from WDFC to EDFC impossible. Commenting on this, [Agrawalla and Raghuram, 2013] state “*This appears to be a very short-sighted policy, since it would be extremely difficult to anticipate future traffic flows beyond even ten years. One can also argue that the current hinterland container flows were more significant from the western*

sea board, reaching even into UP and Bihar, but it is not a desirable situation. This was due to bottlenecks in Haldia and Kolkata ports, which would increasingly get released with new large port projects being conceptualized near the mouth of the river Hooghly. Container traffic from the eastern seaboard is bound to grow and serve the Northern Indian hinterland. This matter needs to be examined so that we do not bind ourselves for the future...

... Also, if moving dimension for EDFC permitted double stack container movement, it would have provided two important flexibilities:

- double stack container trains from the western sea board could have moved seamlessly from the WDFC into the EDFC, if the destinations are beyond Dadri (being the current terminus of the WDFC and junction with the EDFC).
- there would have been greater throughput should any low-density bulk cargo move.”

5.1.3 Renewable resources vs coal

With an inclination towards using renewable resources in future, viability of the EDFC could be a concern since the majority of the traffic was expected to be coal for power plants in northern India from the coal fields in the east.

5.1.4 Double line vs twin single lines on feeder routes

The feeder route from Mundra Port to Palanpur, passing via Gandhidham, is part of the doubling works of the existing railway line. Though there would be a double line route, only one of them is up to the DFC standard. Hence, this route cannot be operated as a streamlined double line, but only as two single lines. This may be true on many of the other feeder routes.

5.1.5 Industrial corridors

The progress for both Logistics Parks and DMIC has been very slow. DMIC was approved in 2007 by the Union Cabinet. Eleven years after the approval, the DMIC is progressing at a slow pace. AKIC, was to be developed along the alignment of EDFC, in a band of 150-200 km. It was approved by GoI in 2014 [PTI, 2014], however, even after four years, the progress has been only up to preparing the ‘Perspective Plan’ [DIPP, Annexure-III].

5.1.6 Ownership of SPV: Timeline

Committee on Infrastructure had constituted a Task Force in May 2005. The Task Force was of the view that the SPV should have a joint ownership between MoR and the “users of bulk freight services like port operators, shipping companies, commodity-based companies in the oil, coal, iron ore, steel and power sectors, largely in the public sector.”†† It would have ensured an adequate equity base, which could be used to leverage market borrowings to raise capital for investment in the DFCs. Department of Economics Affairs (DEA) and Planning Commission shared the same view. However, MoR argued that it was important to put DFCs in place by 2010-11 to maintain an 8 to 8.5 % growth rate of GDP. It also argued that other PSUs should avoid entering into business activities that were outside their core competence. In August 2006, formation of DFCCIL was approved by Cabinet (incorporated in October 2006) under the administrative control of MoR. The purpose of formation of SPV under MoR’s control could not achieve the timelines envisaged [CAG, 2015]. Given the current expected completion by the end of 2020, the project is at least 9 years delayed.

5.1.7 Ownership of SPV: Land acquisition

†† Users of freight services have been taken as is from [Agarwalla and Raghuram, 2013]

[Agarwalla and Raghuram, 2013] stated that “*It is interesting that the task force did not consider the option of a non-IR owned entity, presumably based on the premise that synergy on various dimensions (such as access to the existing network and land acquisition, construction and operations expertise and market development) could be leveraged only through IR.*” Given the difficulties of land acquisition in India, the fact that 1077 km out of 1504 km of WDFC and 1111 km out of 1318 km of the non-PPP EDFC are adjacent to the existing IR network has been a positive for DFCCIL.

5.1.8 Market access

IR being the sole customer of DFCCIL, all other freight customers/qualified operators would be routed through IR. IR would be paying DFCCIL Track Access Charges (TAC) starting from 2020-21, whether it utilizes the path or not. Consequently, there is no revenue risk for DFCCIL, which could have a bearing on their service levels [Kumar, 2018].

5.1.9 Cost

Initially the Debt-Equity Ratio for the project was envisaged to be 2:1. However, now it is 3:1. When cost estimates were revised to 81,459 cr, the liability of IR towards equity increased to 27,153 cr from Rs 9,393 cr [CAG, 2015].

5.1.10 Funding and cost of procurement

Commenting on the funding of the WDFC, [Agarwalla and Raghuram, 2013] state, “*The conditions of JICA loan for WDFC (constituting 80% of WDFC costs) required that 30% of the JICA funding be used for import of equipment and goods from Japan and that all contracts for WDFC must have a Japanese firm as the lead partner. Assuming equipment cost is 40% of the project cost, over 60% of the equipment and goods may have to be sourced from Japan which would significantly narrow the scope of competition. Further, the restriction that only a Japanese firm can be a lead partner in works contracts also reduced competition in procurement of works. The obvious consequence is that procurement may not be at the least possible cost.*”

5.2 Status

5.2.1 Project target

The project, which was conceptualized and given a final go ahead with the setting up of DFCCIL in 2006, was expected to be completed by 2011. The final location survey/Detailed Project Report (DPR) and freezing of alignment was done in 2014, eight years after getting the ‘In Principle Approval’ [CAG, 2015]. The target completion was first shifted to 2016-17, then again to 2017-18 [PTI, 2018] and now to 2020.

5.2.2 Planning and execution

Planning has been an issue since the conception of the project.

- MoR approached CCEA with an estimated cost of Rs 21,140 cr based solely on the Feasibility Report by RITES. They approached CCEA in November 2007 with revised figures of Rs 28,181 cr based on PETS Report by RITES. They again approached CCEA in February 2008 with a cost estimate of Rs 43,293 cr based on Feasibility Report by JICA. It took MoR another six years (February 2008 to March 2014) to finalize the DPR and cost estimates. Based on the DPR, the project cost was put at Rs 81,459 cr excluding the PPP portion. Approaching CCEA without credible estimates and a sound financing plan was a premature move. Further, MoR approached CCEA with cost estimates based on JICA Feasibility Report without firming up a financing plan for EDFC or a CA between MoR and SPV. The latter was finalized in 2014 [CAG, 2015].

- MoR did not give due weightage to the timeline for completion of the project. This is evident from the fact that in all Cabinet Notes, MoR mentioned the completion period to be five years, without specifying the ‘zero’ date for commencement of the same [CAG, 2015].

5.2.3 Land acquisition

As of December 2018, DFCCIL has acquired 98.5% of the required land. Though only 1.5% remains (presumably due to difficulties in land acquisition), these have higher number of affected patches per kilometer. It can pose a problem in construction of the DFC and can further delay the timeline for completion of the project. The details of affected patch per kilometer is given in Table 4. For instance, In the Sachin-Vaitarna section in WDFC, there are twelve affected land patches in 4.9 km. Similarly, in Dadri-Khurja EDFC-1 section, there are six affected land patches in 5.03 km. The number of affected land patches per kilometer is higher in EDFC.

5.2.4 Traffic projection

For the year 2021-22, the PETS Report by RITES projected a traffic of 85.5 mt for WDFC and 91.3 mt for EDFC. For the year 2021-22, the DFCCIL Corporate Plan projected a traffic of 167.1 mt for WDFC and 219.6 mt for EDFC for WDFC is 167.1 mt for 2021-22. Traffic projections based on DFCCIL Corporate Plan 2017-22 are given in Table 6 and Table 7. The figures are more optimistic in the Corporate Plan for all the commodities. The maximum increase in the projection has been for the coal movement. The traffic projected for coal in the RITES PETS Report for EDFC was 62.9 mt, while it has increased to 119.5 mt in the Corporate Plan. The RITES Report did not consider the container traffic for EDFC. However, as per the Corporate Plan, there would be container traffic of 8.5 mt.

Table 6: Traffic projections for WDFC based on DFCCIL Corporate Plan 2017-22 (mt)

WDFC					
Commodity	2018	2019	2020	2021	2022
Container	45.6	49.8	54.3	59.2	64.6
Coal	21.5	22.4	23.3	24.2	25.2
Food grains	8.1	8.4	8.6	8.8	9.1
Fertilizer	11.5	11.9	12.4	12.9	13.4
Cement	6.3	6.8	7.3	7.9	8.5
Steel	1.6	1.7	1.9	2.0	2.2
POL	6.7	6.9	7.0	7.2	7.3
MISC	6.6	6.8	7.0	7.2	7.4
Total	108.0	114.6	121.8	129.4	137.7
Modal shift from Road	12.7	13.3	14.0	14.7	15.4
DMIC Traffic	4.6	6.1	8.0	10.6	14.0
Grand Total	125.3	134.1	143.8	154.8	167.1
CAGR (%)	11.2	11.4	11.7	12.0	7.5

Table 7: Traffic projections for EDFC based on DFCCIL Corporate Plan 2017-22 (mt)

EDFC					
Commodity	2018	2019	2020	2021	2022
Container	6.2	6.7	7.2	7.8	8.5
Coal	102.2	106.2	110.5	114.9	119.5
Food grains	13.8	14.2	14.6	15.0	15.4
Fertilizer	5.2	5.4	5.6	5.9	6.1
Cement	9.3	10.0	10.8	11.7	12.6
Steel	11.8	12.7	13.7	14.8	15.9
POL	4.1	4.1	4.2	4.3	4.4
MISC	21.3	21.9	22.6	23.3	24.0
Total	173.8	181.3	189.3	197.6	206.3
Modal shift from Road	10.9	11.4	12.0	12.6	13.2
AKIC Traffic	0.0	0.0	0.0	0.0	0.0
Grand Total	184.6	192.8	201.3	210.2	219.6
CAGR (%)	6.5	6.3	6.2	6.1	4.4

[DFCCIL, Corporate Plan]

6. Conclusion

DFCs present a significant opportunity for freight logistics in India. What is important is to see how the increasingly optimistic traffic projections will be realized. That depends upon the industrial and trade growth in India, and the development of industrial corridors and the feeder network. In order to leverage the full efficiency of the DFC, we will also need rolling stock that can take advantage of the increased axle loading capability. On the EDFC, the dependence on coal traffic would be a concern since there could be disruptive changes on the sources of energy in the long run. Further, the prospect of increasing container traffic could be affected adversely since the EDFC would permit single stacking only. Another important concern would be the sole intermediary role played by the Indian Railways, which has to bring in the end users. Indian Railways has not always been known for its customer centricity.

Overall, the DFCs have the potential to be a game changer for the Indian economy.

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