

ERC Transformation – baseline and improvement targets

Confidential

Draft |17/12/2018





- **National network**
- ALRT

Executive summary

Rail in Ethiopia can be economically competitive vs. alternatives in both freight and passenger transport, with freight transport being more profitable than passenger transport. Freight transport has a positive impact on the rail company's P&L, while passenger transport has a positive impact on the balance sheet in the long term; Infrastructure development is usually subsidized by governments and lines are expected to breakeven operationally. This explains the low attractiveness for private investment (90% of existing privately owned networks (20% of total rail network worldwide) is dedicated to private industrial use (e.g. mines).

Rail in Ethiopia has a great opportunity to support GTP 2 targets, as ~85% of freight volumes are containers and bulk commodities; and despite financial tradeoffs associated with transporting passengers, ERC/EDR could offer passenger transport for social benefits.

Capturing the full potential of rail in Ethiopia (e.g. bulk and container transport for long distances) will allow ERC/EDR to be profitable in the long term without subsidy on Addis-Djibouti and with limited subsidy on Awash-Makele, while the planned lines would require significant levels of subsidies:

- **Capturing the potential on existing lines** (Addis-Djibouti and Awash-Mekele), **while becoming profitable**; Focusing on existing lines would allow ERC to move towards profitability on the Addis-Djibouti line, breaking even (incl. financial fees and forex loss) by 2030; the Awash – Mekele line will require government subsidies to recover operational and financing costs beyond 2030. **Capturing this potential would require additional targeted investment (~550 Mn USD) to optimize current line capacity and capture additional demand**
- **Deprioritizing the development of new lines unless conditions change** (e.g. new large scale extractive industry, strategic rail corridor to neighboring countries)
 - **While Mojo-Moyale and Finotesalem-Galafi lines concentrate 16% of total traffic expected by 2030, recovering opex by 2030 is highly dependent on achieving optimistic GDP II projections, and capturing at least 60% of the traffic** (+20pt more than international benchmark); initial investment and financing costs unlikely to be recovered even beyond 2030 in the best case scenario
 - **The remaining lines have limited financial upside and would only be developed for developmental purposes.** Alternatively to developing the remaining lines, the government could consider connecting these regions through road or air.
- In all cases, passenger traffic contributes negatively to the P&L but could contribute positively to the balance sheet of ERC through land development around station district (around Addis, Dire Dawa for Addis-Djibouti line)

The realization of rail potential in Ethiopia relies on line capacity optimization, and maximal demand capture, and is enabled by systematic capability building, a healthy balance sheet and supportive regulation and sector governance

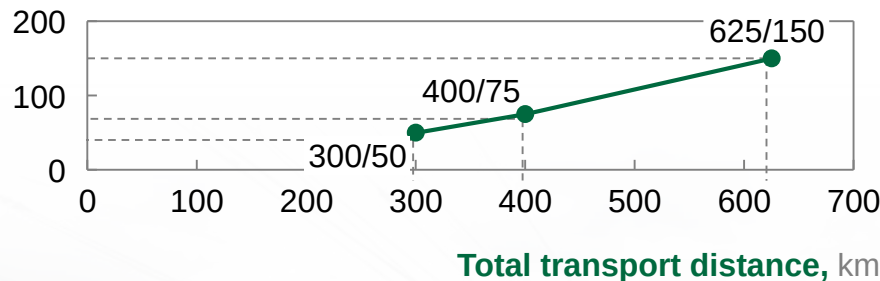
- **Pillars**
 - **Capacity optimization** through **strategic capex investment** (e.g. security fencing, additional passing loops), and **effective operations**
 - **Maximal demand** capture through **strategic sales and marketing activities** (strategic pricing and point-to-point logistics), and **capex investment** in additional fleet and rail links to customers
- **Enablers**
 - **Systematic capability building** across the whole sector to establish key professions or capabilities that are currently missing (station management, and real estate), and improve existing capacities (network operations, line operations, contracting)
 - **A balance sheet that allows ERC to pursue profitable investments** (e.g. additional fleet, sidings, link rail to major customers)
 - **Regulations / sector governance** - the Ethiopian government should have an active role in supporting the development of the rail sector by
 - **Revising the sector governance structure** to facilitate seamless cooperation between different stakeholders, as the current structure doesn't allow the value creation of rail to be optimal
 - Setting up **regulations to support adoption of rail for suitable freight flows** and optimize the country level transport sector (e.g. authorizing competitive pricing for rail)
- 17 initiatives should be successfully implemented by ERC, EDR, and the Ethiopian Government in the next 3 years in order to enable rail in Ethiopia to achieve its potential

Rail can be economically competitive vs. alternatives in both freight and passenger transport...



Freight

Distance from rail commodities are transported, km



The farther the customer is from the rail head, the longer distances the commodities need to travel for rail to be competitive

Ponderous products (i.e., high density, nonperishable)



KPI: density, average wagon weight



Rail is more competitive in the transport of high volumes of products



Passenger



Time

- Faster than bus
- Slower than plane



Reliability

- More reliable than bus on average and on par with plane



Comfort

- Not turbulent or cramped like planes
- Not affected by poor road quality like bus



Cost

- ~15% more expensive than bus
- 3-5x less expensive than plane



Safety Statistics

- 25x less injuries than road transport
- 14x less fatalities than road



Distance traveled



Products transported



Volume of traffic

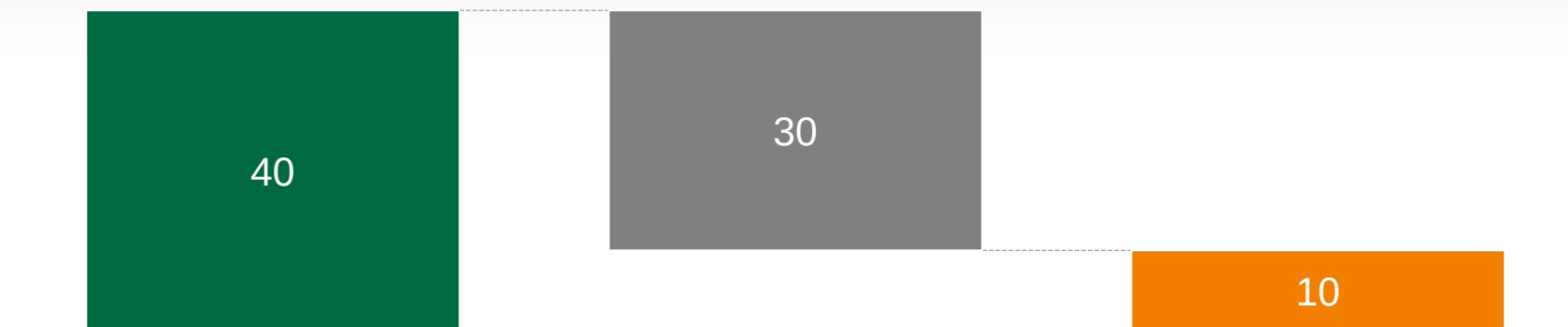


...but freight transport is usually profitable, while passenger transport is subsidized

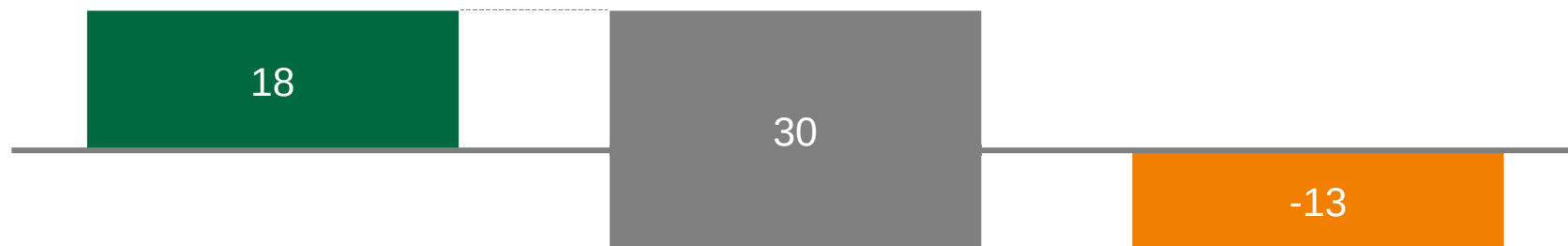
Unit economics, '000 USD/train trip¹

■ Revenue ■ Operating Cost² ■ Profit

Freight



Passenger



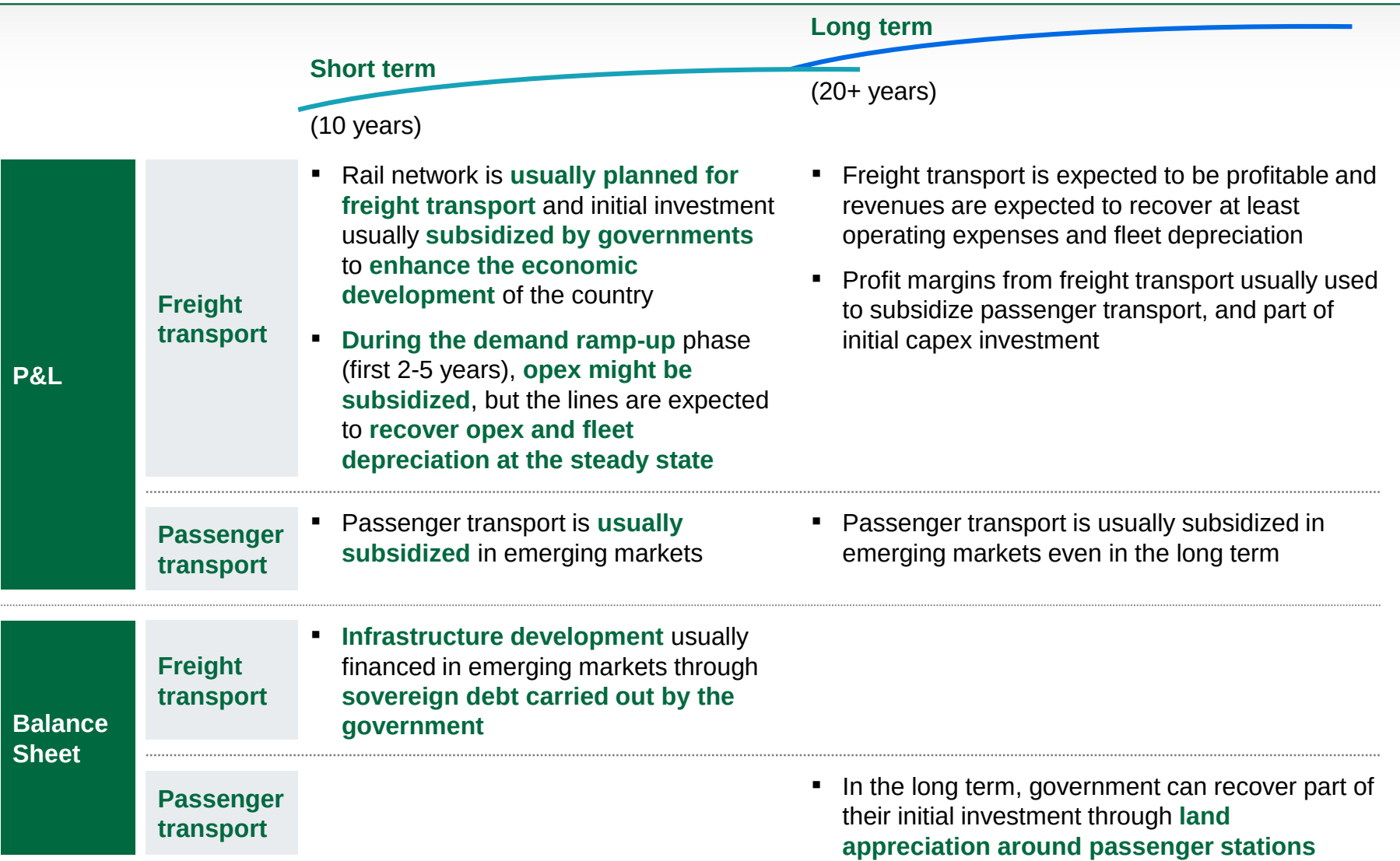
¹ Based on current freight and planned passenger revenues and trains run by EDR for Q2; freight includes empty and full trains.

² Based on EDR Performance Report, assuming 7 trains a day.



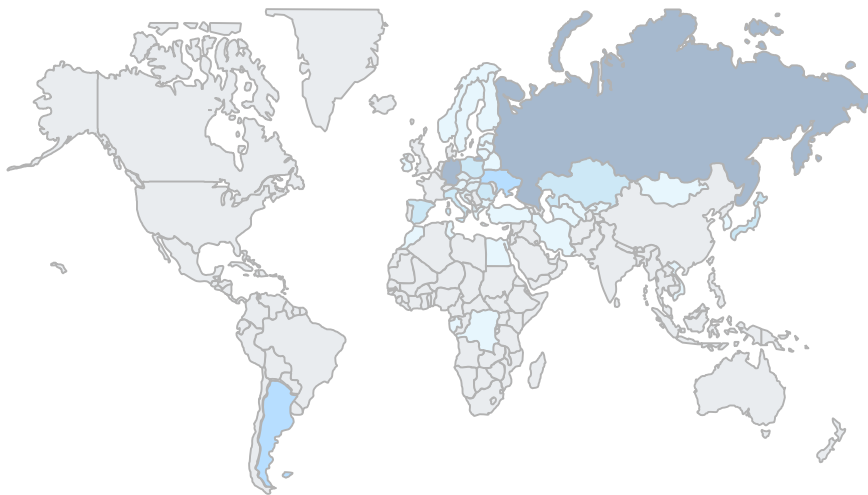
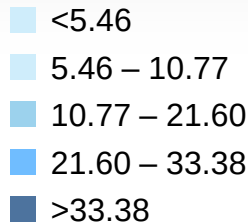
Freight transport has a positive impact on P&L, while passenger transport has a positive impact on the balance sheet in the long term

P&L and Balance Sheet characteristic in rail business

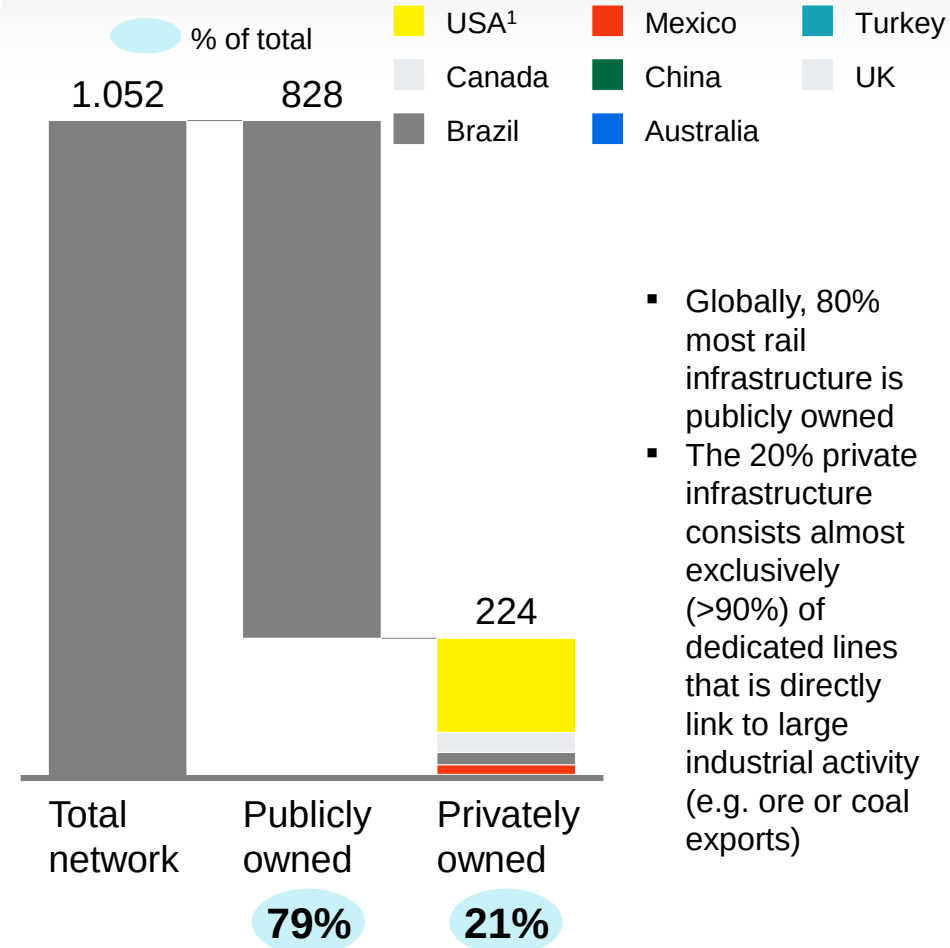


Only ~20% of world rail infrastructure is privately owned – mostly in mature markets/dedicated to industrial activities

World Rail network ('000 km, 2016)



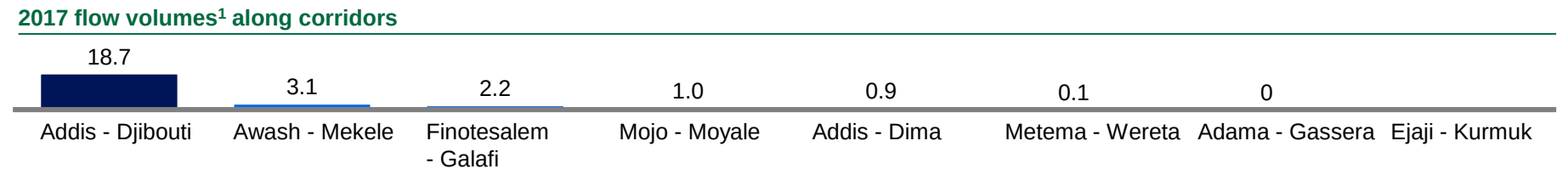
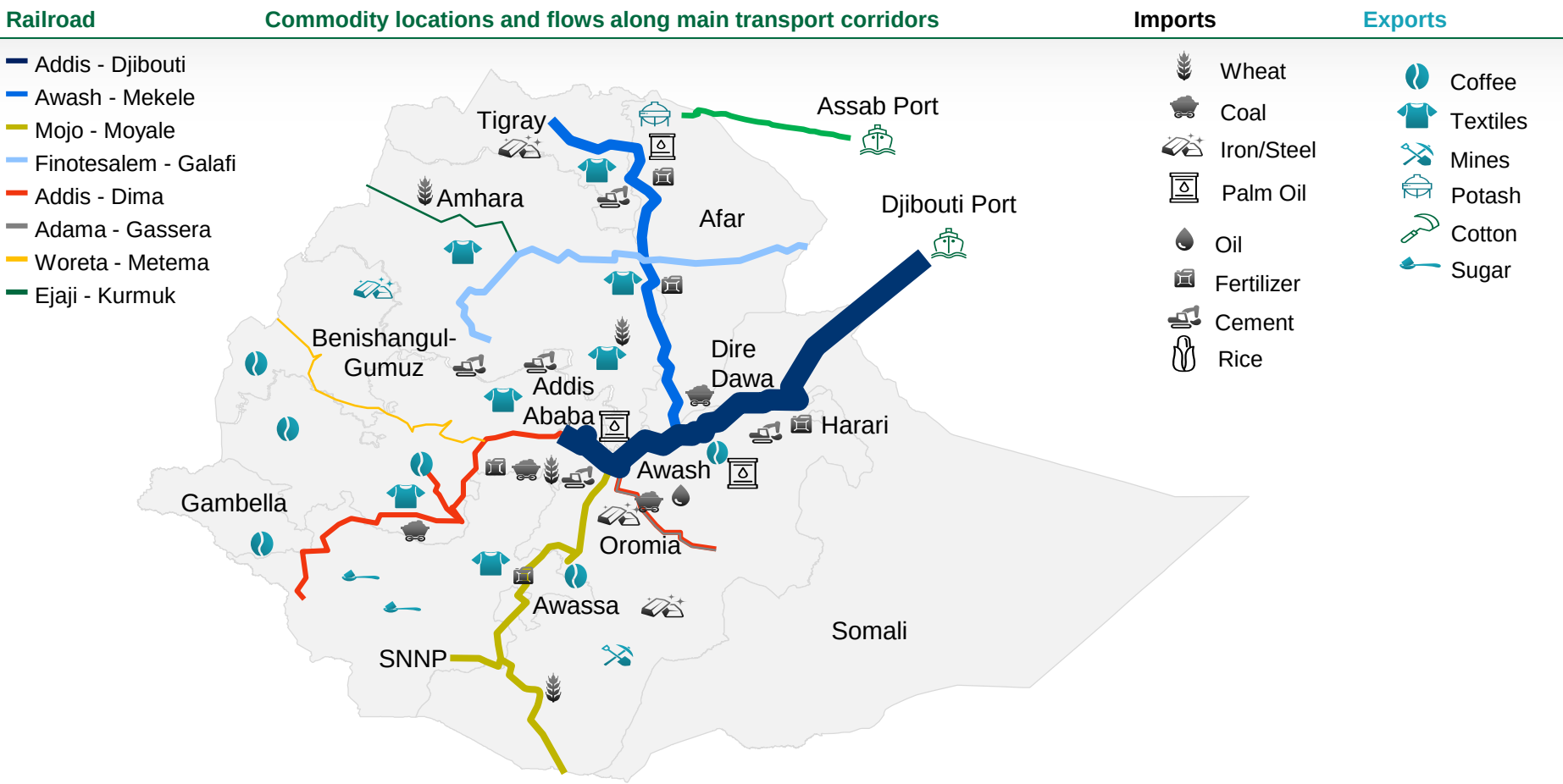
World Rail network ('000 km, 2016)



Limited attractiveness for network development for private investors worldwide

¹ Privatized rail networks in the USA was driven by historical ability of private companies to secure significant capital, a situation that is unique in the world

~85% of trade flows are concentrated along corridors with completed or in-progress lines: Addis – Djibouti and Awash - Mekele



¹ Includes imports, exports, and intranational volumes. Intranational volumes are derived from import/export data from ERCA as well as individual cement and coal mines.



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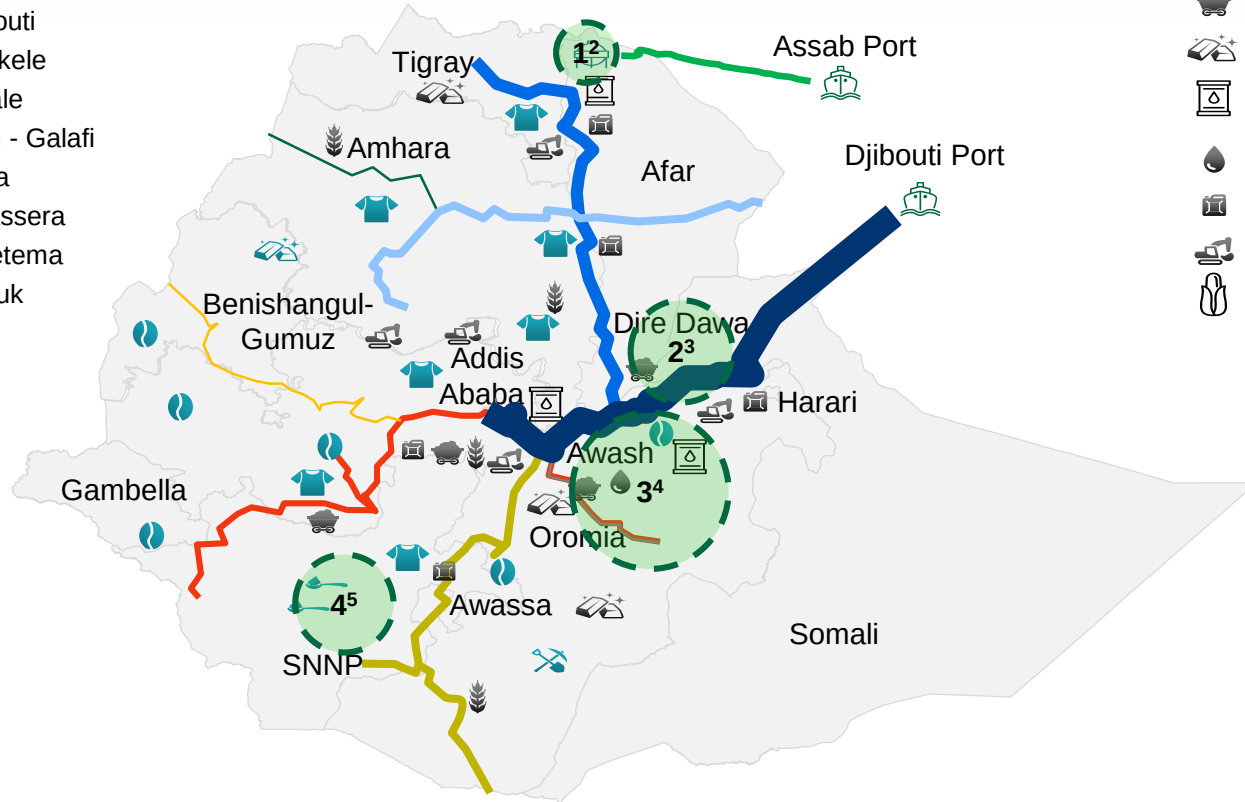
Locations of resources – volume represented by size of circle (MTPA Scale)

Railroad

Commodity locations and flows along main transport corridors

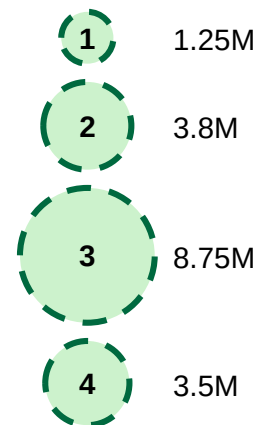
Exports

- Addis - Djibouti
- Awash - Mekele
- Mojo - Moyale
- Finotesalem - Galafi
- Addis - Dima
- Adama - Gassera
- Woreta - Metema
- Ejaji - Kurmuk



- ☼ Wheat
- ☼ Coal
- ☼ Iron/Steel
- ☼ Palm Oil
- ☼ Oil
- ☼ Fertilizer
- ☼ Cement
- ☼ Rice

- ☼ Coffee
- ☼ Textiles
- ☼ Mines
- ☼ Potash
- ☼ Cotton
- ☼ Sugar



1 Includes imports, exports, and intranational volumes. Intranational volumes are derived from import/export data from ERCA as well as individual cement and coal mines.

2 Based on Potash projections

3 Based on fertilizer production (3.8MTPA)

4 Based on oil projections (8.75MTPA) to Awash

5 Based on sugar projections (3.5MTPA)

By 2030 total flows in Ethiopia could reach 65 MTPA in the base case and 95 MTPA if aspirational national growth targets are fully met

used for line projections

Projection scenarios for commodity volume flows in Ethiopia by 2030

Assumptions

Current situation

- Base Year: 2017

Base case – GDP-based growth

- Base Year: 2017
- Growth Rate:
 - 7.3²%, projections for Ethiopian GDP growth
 - Historically, GDP and traffic grew at similar rates (~10% in the last 5 years)

High case – GTP II and GDP

- Base Year: 2017
- Growth Rate: 10.1%, derived from GTP II projections plus individual commodities

Projected 2030 volumes along each corridor¹

Current Corridor Volumes (Million Tons Per Year)

Addis - Djibouti	18.7
Awash - Mekele	3.1
Mojo - Moyale	1.0
Finotesalem - Galafi	2.2
Addis - Dima	0.9
Metema - Wereta	0.1
Adama - Gassera	0
Ejaji - Kurmuk	0

Base Case Corridor Volumes (Million Tons Per Year)

Addis - Djibouti	46.7
Awash - Mekele	7.7
Mojo - Moyale	2.5
Finotesalem - Galafi	5.4
Addis - Dima	2.2
Metema - Wereta	0.3
Adama - Gassera	0
Ejaji - Kurmuk	0

High Case Corridor Volumes (Million Tons Per Year)

Addis - Djibouti	63.9
Awash - Mekele	12.3
Mojo - Moyale	7.7
Finotesalem - Galafi	7.5
Addis - Dima	2.6
Metema - Wereta	1.0
Adama - Gassera	0.1
Ejaji - Kurmuk	0

Total (Million Tons Per Year)

26

65

95

¹ Includes imports, exports and major intra-traffic

² Historical trade growth on GDP growth ratio, applied to forecasted GDP growth



Based on the optimistic best case scenario

80% of flows expected around existing lines; Mojo – Moyale and Finotesalem – Galafi concentrating next largest traffic based on GTP II

X% Percent of total freight volume ■ 2017 Volume ■ GTP II Growth Rates Until 2030

Status	Line	Volume along corridor (tons, millions) ¹			Comments
Existing	Addis - Djibouti	18.7	45.2	63.9	67% ▪ ERC should focus on capturing key commodities , such as oil, containers and fertilizer, which make up 1/3 rd of total flows
	Awash - Mekele	3.1	9.2	12.3	13% ▪ 25% capture rate of GTP II 2030 projections for breakeven ▪ Dependent on Potash flows; conflicting with Assab line
Planned	Mojo - Moyale	1.0	6.7	7.7	8% ▪ Heavily reliant on sugar projections; 3.5 Mt out of a total 7.3Mt projected through GTP II on the corridor (48%)
	Finotesalem - Galafi	2.2	5.3	7.5	8% ▪ May cannibalize flows from Addis – Djibouti in short term , but provide additional capacity as Addis – Djibouti ramps up
	Addis - Dima	0.9	1.8	2.6	3% ▪ Reliant on coffee and textiles from Jimma Industrial Park; neither are projected to grow enough to support the line
	Wereta - Metema	0.1	0.9	1.0	1% ▪ Flows dependent on sesame seed
	Adama - Gassera	0.1			0% ▪ Need more info on commodity flows
	Ejaji - Kurmuk				0% ▪ Need more info on commodity flows
	Assab Port ²	0.9			1% ▪ Yara project could export up to ~1Mt; despite high margin producers could receive from exporting premium potash extracted in Dallol, low volumes make rail line construction financially infeasible

¹ Does not include potential for additional flows from connecting to ports (e.g., Port Kenya for Mojo – Moyale, Port Sudan for Wereta – Metema, etc.)

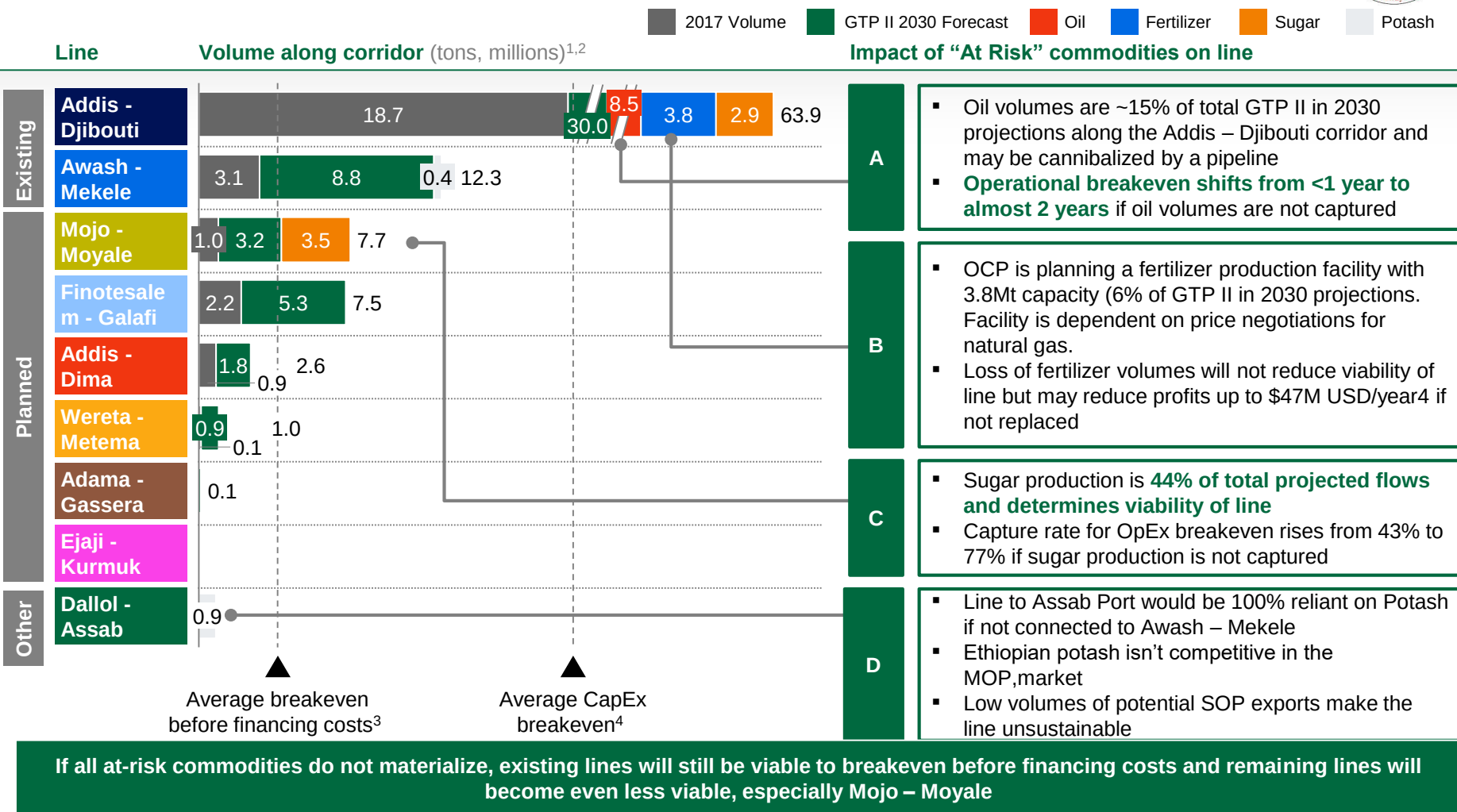
² Rail to assab Port is not included in GTP II plans but has potential for consideration, especially given recent peace agreement with Eritrea

SOURCE: Addis - Djibouti and Awash - Mekele feasibility studies; Rail Network Division; GTP II; OCP; Illovo



Based on the optimistic best case scenario

Traffic projections based on the realization of key strategic projects;
in the absence of which planned lines will be even less attractive



1 CapEx for Addis – Djibouti and Awash – Mekele Capex are known; remaining lines were ranged based on lowest and highest CapEx/km for sub-sections of existing lines.

2 Breakeven volumes are defined for individual lines but are displayed as the average across all lines

3 Defined as the volume necessary to breakeven against operating, maintenance, and rolling stock depreciation costs. OpEx/km is derived from EDR feasibility report; price is measured at operating cost of truck. All lines except Addis - Djibouti are allocated marginal profits from Addis - Djibouti for goods that would use truck if respective line was not built

4 Defined as the volume necessary to breakeven against all costs. CapEx costs are estimated based on average capital expenditure per km from Addis - Djibouti and Awash – Mekele

Significant trade flows could be moved effectively by rail, in particular imports on the Addis-Djibouti corridor: containers to Mojo, oil to Awash, steel for construction along the corridor and for export fertilizer from the planned plant in Dire Dawa

Rail competitiveness for freight transport

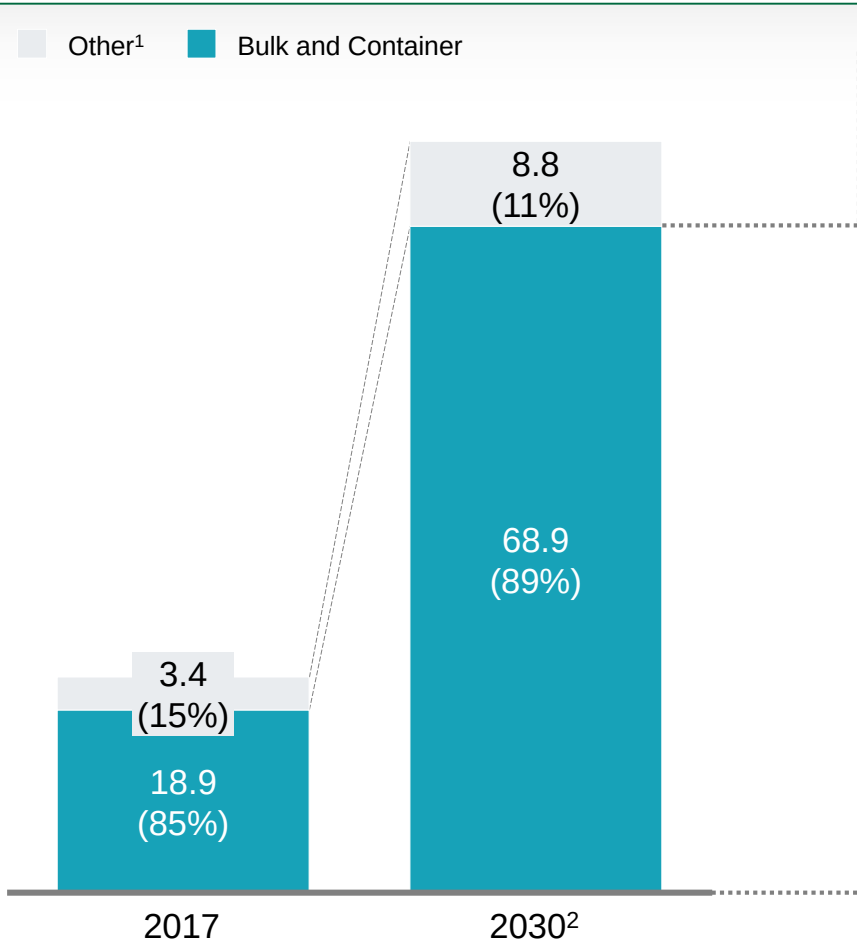
	Point to point high volume bulk flows (> 1 train a day)	Point to point low volume bulk flows (1 train a week)	Bi-modal concentrated container flows	Bi-modal container flows
Freight that is typically transported on rail 	Point to point flows of heavy bulk (export of coal or ores)	Bulk and container transport with relatively short distance from the origin / to the end destination (e.g. oil imports to refinery if there is no pipeline)	Containers on high volume corridors between import terminals and depots	Bulk and container transport with relatively long distance from the origin / to the end destination
Distance 	>100km	>400km	>600km	>1.000km
Examples in Ethiopia¹ 	- Oil transport from Djibouti to Awash (8.5MTPA) - Fertilizer export from Dire Dawa to Djibouti (1.9MTPA)	Potential Potash export from Dallol to Assab (0.9MTPA)	Containers from Djibouti to Mojo (9.3MTPA)	NA

¹ volumes estimated by 2030

ERC has a strong role to play to support GTP 2 targets as 85 - 90% of freight volumes are within rail natural market (containers and bulk commodities)...

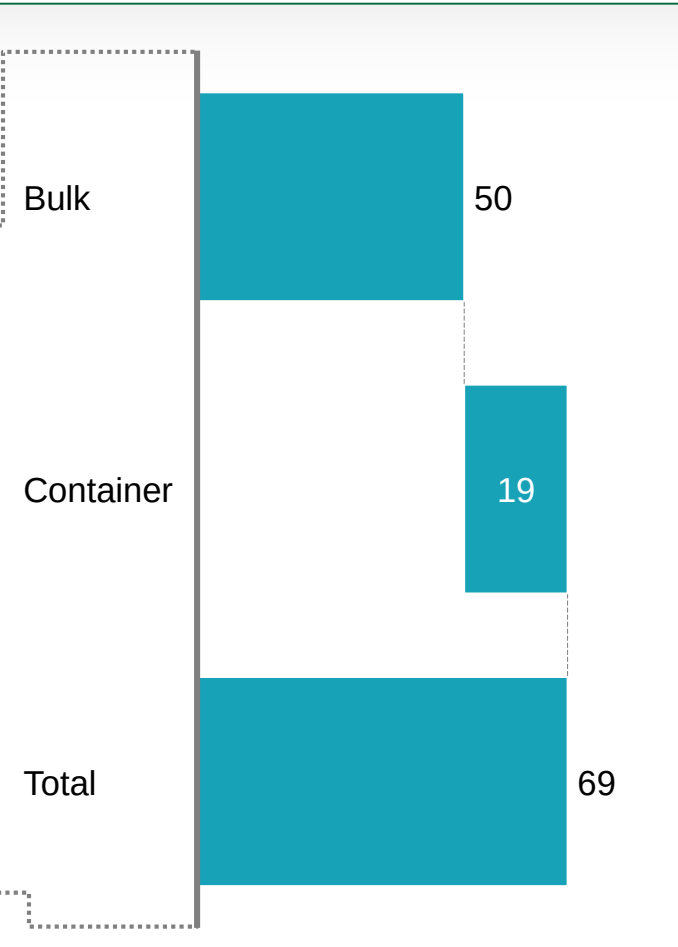
Current and projected flows

Million tons per year



Bulk and container breakdown

2030, Million tons per year



- Dominance of bulk and container commodities is conducive to rail success
- ERC should focus on capturing containers and bulk goods through:
 - Network optimization
 - Capacity optimization
 - Customer acquisition
 - Pricing

¹ Includes Livestock and "Other" from ERCA

² Forecast using best case assumptions, including extrapolated GTP II projections and individual commodity forecasts



... for which it can provide macroeconomic benefit to Ethiopia by creating structurally lower transportation prices for imports/exports

Macro-economic benefits of rail

- Rail provides structurally lower transportation prices for the economy for bulk commodities transported for long distances
 - Reduces overall cost of goods for producers, which can be passed onto consumers
 - Dependent on effective rail system which does not add handling costs higher than road
- In specific cases, link rails can also remove costs and operational hurdles for individual producers
 - In OCP example, link rail would eliminate double handling costs
- ERC’s pricing for rail will determine how the savings are allocated between ERC and importers/exporters

Structural price deflation

- With no double handling costs, operational costs of transportation are 20% lower on rail
- Savings can be absorbed by ERC, logistics companies, transporters, or end consumers

Operational Transport Costs² (USD per tkm)

Mode	Operational Transport Costs (USD per tkm)
Road	0.026
Rail	0.021

OCP example

- Building a link rail to OCP factory reduces double handling costs of multimodal operations
- OCP can save up to \$9.5M annual on handling and transport costs

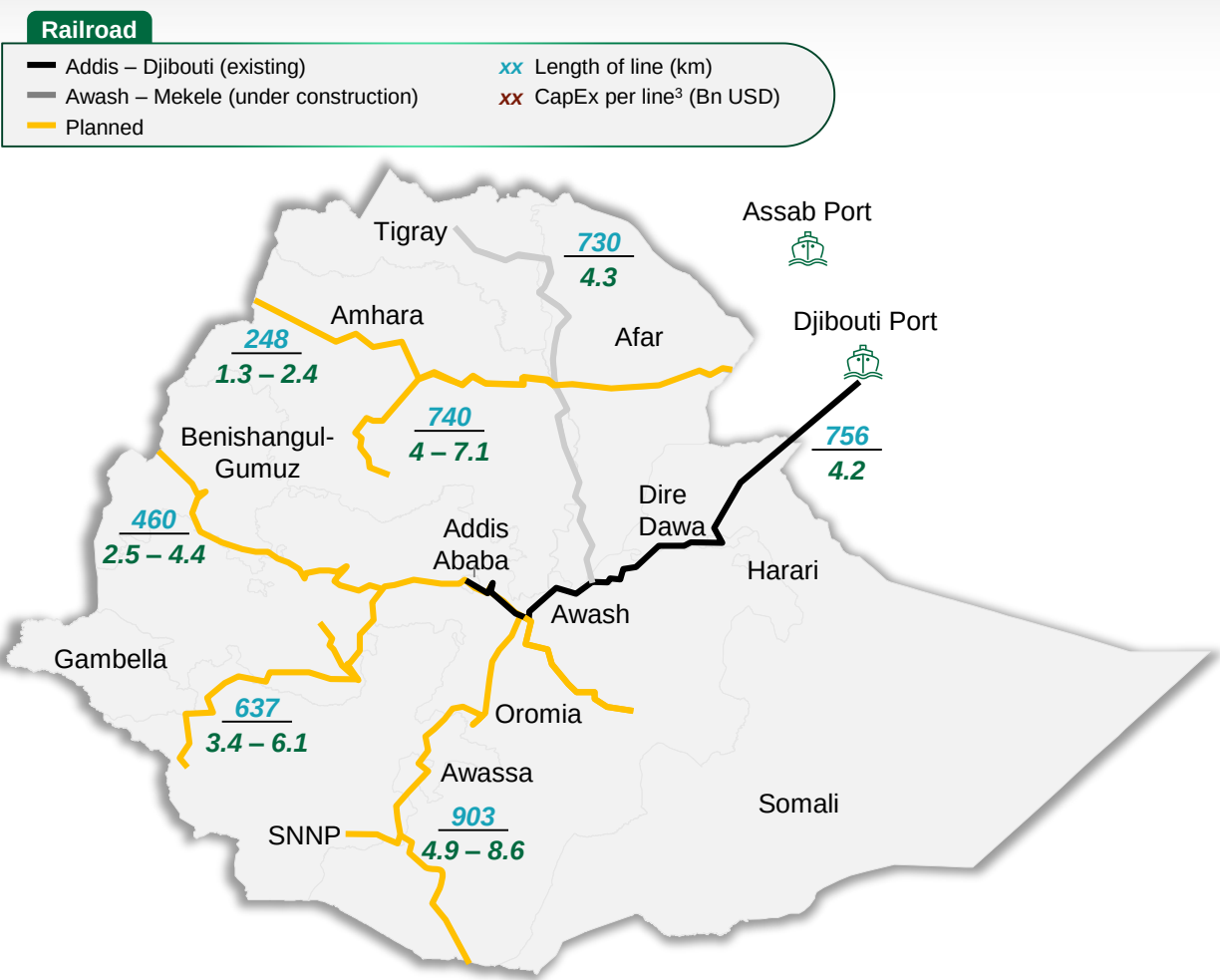
OCP Transport Options¹ (Annual USD, Millions)

Option	Road Cost (M)	Rail Cost (M)	Loading Cost (M)	Total (M)
Link Rail	41	9	0	50
MultiModal	18	1	40	59
Truck Only	80	9	0	89

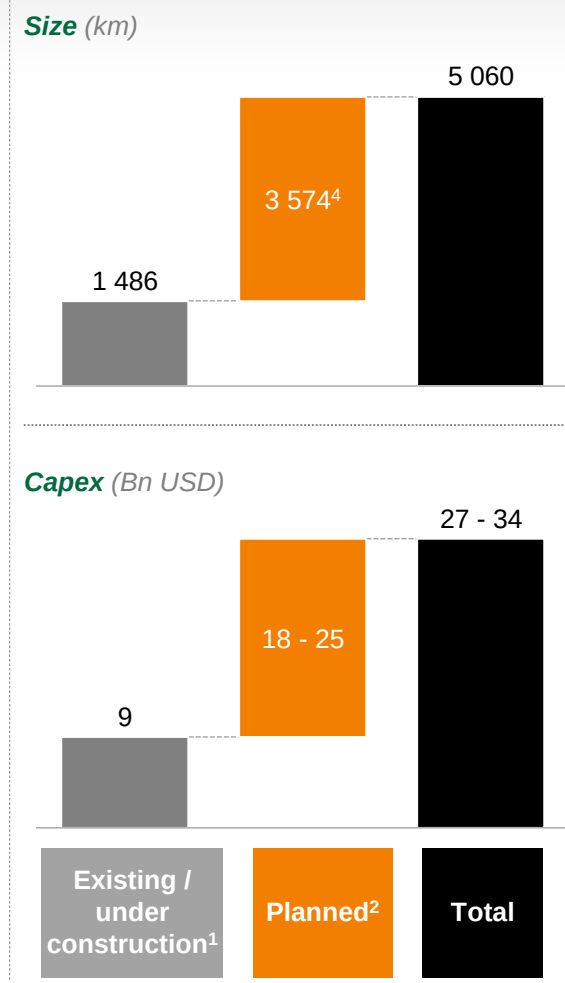
1 Rail operational costs derived from ADR Tariff Report; road operational costs from expert interviews. Road and rail operational costs are averages and subject to variation based on distance, technology, etc.
2 Assuming 2.5MTPA, 5km link road, 0.049USD/TKM rail price, and 90birr point-to-point truck cost, and equal volume to Mojo and Djibouti

Given the stakes – capex cost of planned GTP 2 lines projected at 18 to 25 Bn USD – a clear roadmap is in order

Existing and planned rail infrastructure



Network metrics

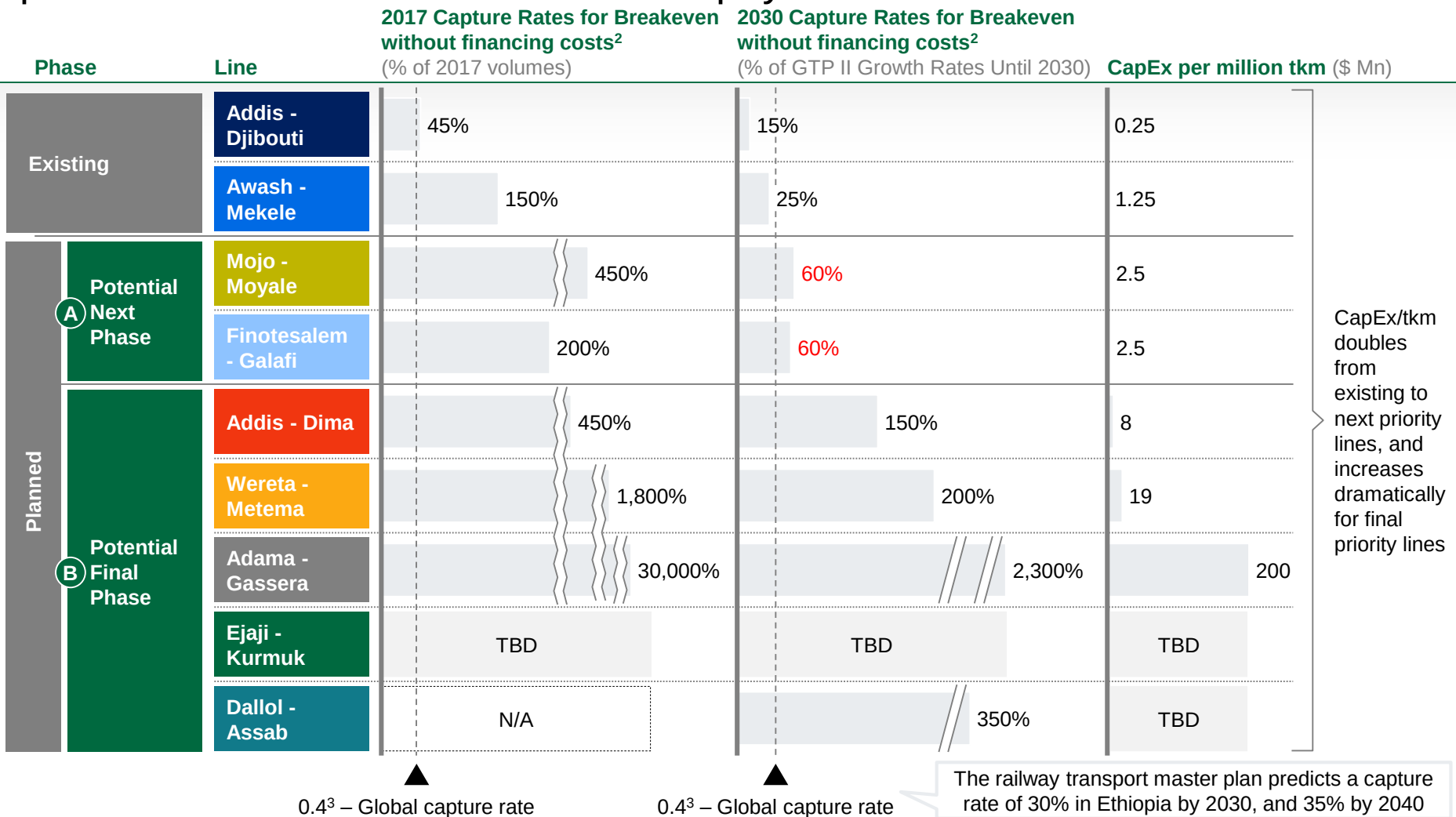


1 Based on total capital cost of lines, including survey and design, interest, consulting costs, etc.
 2 Assuming the future capex per km is at least 2x the average capex per km from Addis - Djibouti and Awash - Mekele
 3 CapEx is listed as total cost and includes contract price, interest, insurance, right of way, consultants, design, etc.)
 4. 3,236km of remaining line estimated to be main lines, 338 km of remaining line estimated for passing loops and minor link rails along main lines



Based on the optimistic best case scenario

In the optimistic high case scenario¹, and assuming high modal share of 60%, two additionally planned lines could become operationally profitable but could not cover interest payments for infrastructure



¹ Might not be realized given that current situation is behind GTP II projections

² Percent of total corridor flows necessary to breakeven along each line; based on EDR operating expenses and average CapEx from Awash - Mekele and Addis - Djibouti lines. Breakeven defined as revenue matching operating, maintenance, and rolling stock depreciation costs.

³ Average global model share of freight rail



1

Capture the potential on existing lines (Addis-Djibouti and Awash-Mekele), **while becoming profitable.**

- Focusing on existing lines would allow ERC/EDR to move towards profitability on the Addis-Djibouti line, breaking even (incl. financial fees and forex loss) by 2030; the Awash – Mekele line will require government subsidies to recover operational and financing costs beyond 2030.
- **Capturing this potential would require additional targeted investment (~550 Mn USD) to optimize current line capacity and capture additional demand**



2

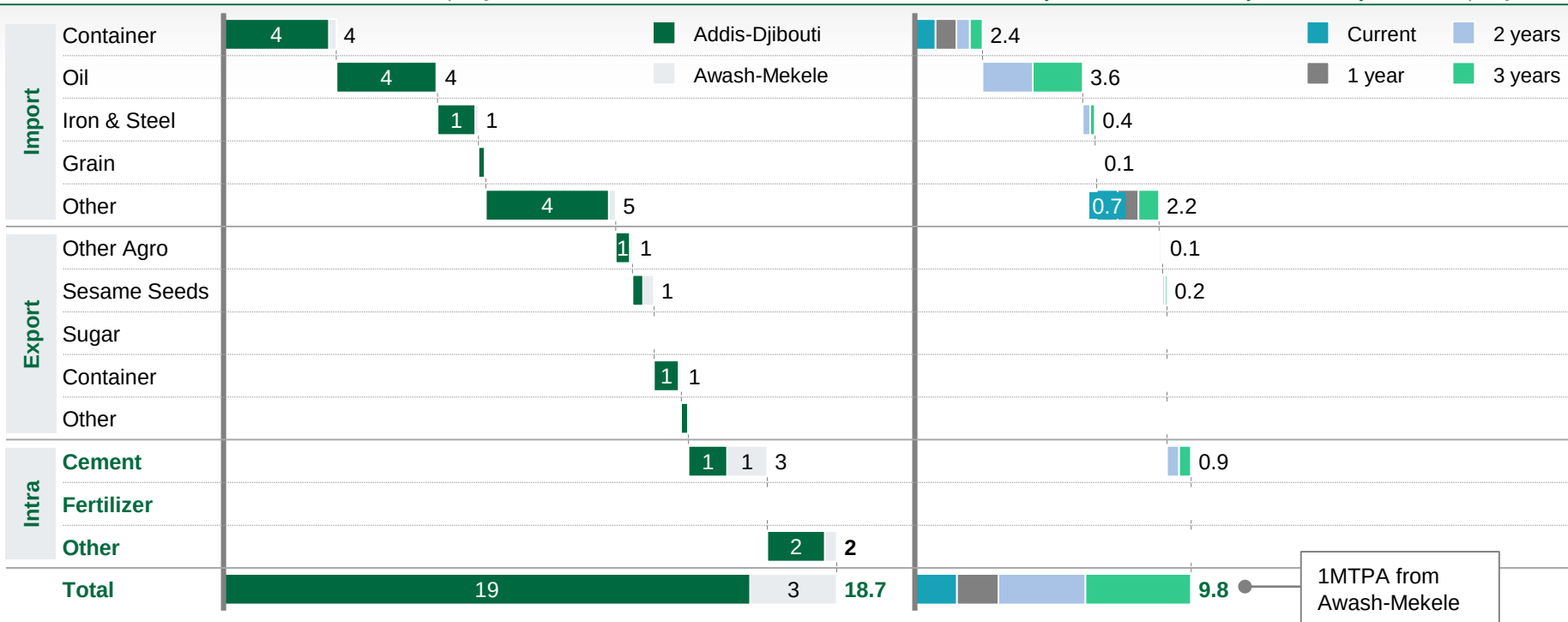
- **Deprioritize the development of new lines unless conditions change** (e.g. new large scale extractive industry, strategic rail corridor to neighboring countries)



ERC could capture ~50% of current trade flows for bulk goods and containers that naturally belong on rail through revising the pricing policy and end-to-end customer logistics

Total current flow, Mt per year

Current and planned demand capture transported, Mt per year



Rationale

- Optimize current fleet utilization on import and export
- Build on steel transport
- Capture oil transport in 1 year
- Focus on capturing dry bulk agricultural products for export

Requirements

- Pricing strategy for bulk commodities for export to compete reasonably with rail
- Focus on capturing bulk agriculture customers in Tigray, SNNP etc
- Freight sales unit to diversify current customers for the rail to include international shipping lines and private freight forwarders
- Linkages to major export manufacturers and industrial parks



Based on the optimistic best case scenario

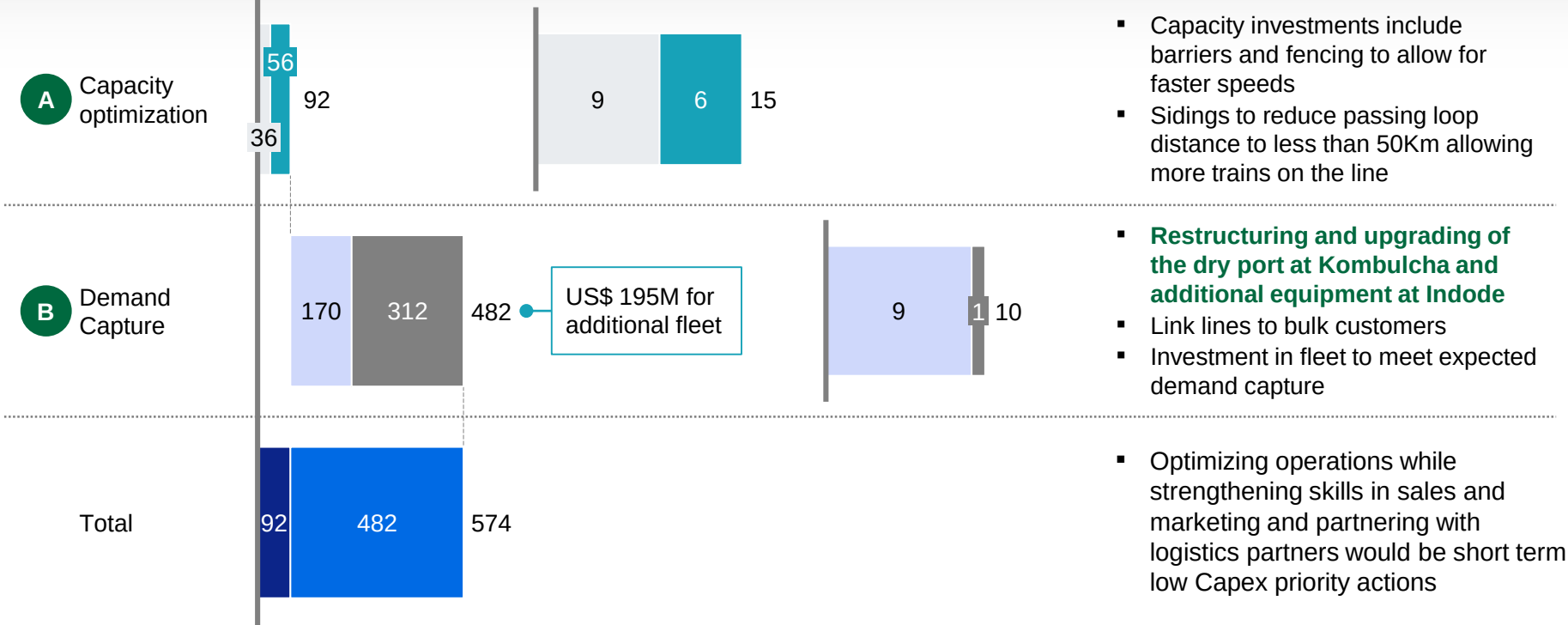
By investing in capacity optimization and demand capture we could expand line capacity to 15MTPA with potential additional demand capture of 10MTPA

Capex investments for capacity and demand optimization US\$ Million

Expected capacity increase (one way), MTPA

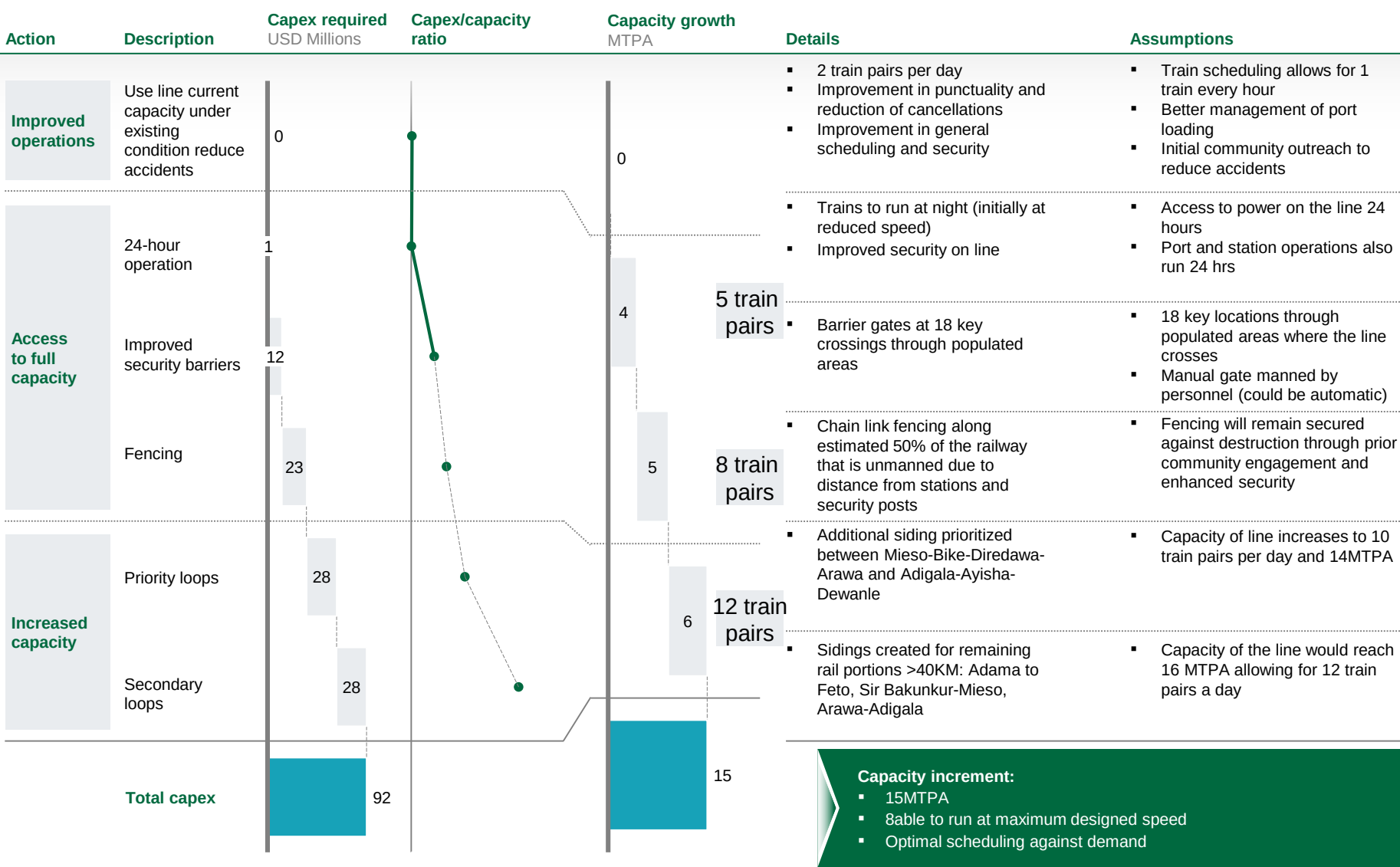
Potential demand- flow capture, MTPA

Optimization Addis-Djibouti Capacity Siding Awash-Mekele Demand



- Initially increase capacity through improved operations and then by improving security to increase the number of trains, reduce time between trains and by increasing hours of operations
- Demand capture investments could primarily be financed through PPP's reducing the actual Capex investment
- Demand capture on the Awash-Mekele line reliant on the development of dry ports at Kombutcha and Indode, which represent a large investment
- Line capacity optimization investments would require additional regional and local government support to be effective

A An investment of ~US\$ 90 Million is needed to achieve the medium term capacity gain of 15MTPA on the line



B To capture demand, investment in sales and marketing, depots and links to the fertilizer factory will be needed while providing end-end logistics

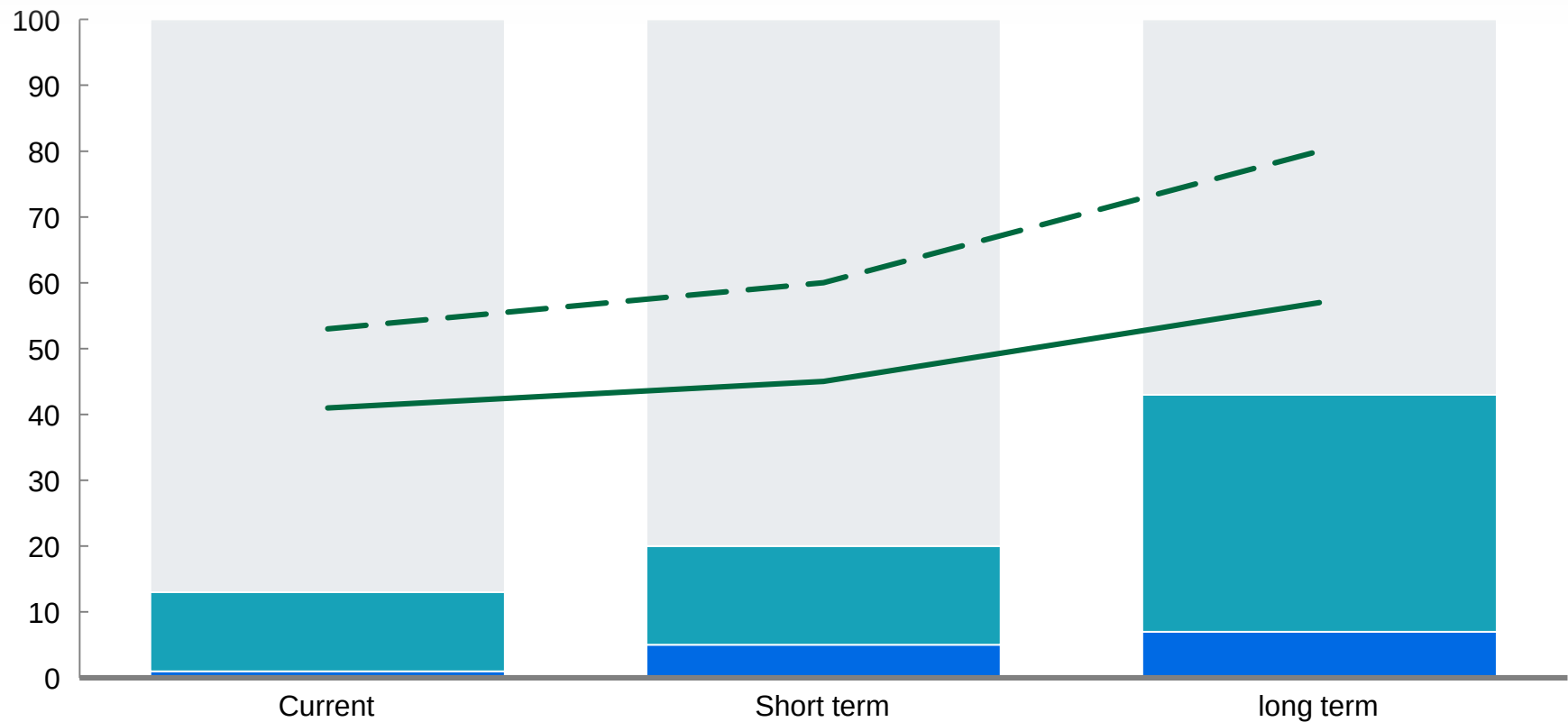
Action	Description	Capex required USD Millions	Details	Pros	Cons
BD/ Marketing sales units	Create an internal unit for development of relations and business for freight transport. Marketing and sales initiatives through freight expos	1	- Creation of a separate BD unit within ERC focusing on 4 stakeholders of freight - Track access sales to independent operators	- Local skill development - Direct management of revenue drivers	Contract management and KPI delivery across multiple stakeholders
3PL logistics	Invest in an in-between logistics transport system for rail head to depot transfers	1	Contracts with freight forwarders and 3PL partners for end-to-end goods transfer	Provide end to end freight logistics for the region	High level of competition and unknown reliability
Link turnouts to key importers/ exporters	Link lines to key importers/exporters e.g. cement and fertilizer	125	- Connect last mile to fertilizer factory and cement - Could be funded through PPP models	Reduced freight cost for rail should drive higher volume	Capex investment funding not available
Inland dry ports	Set up inland port at Kombulcha and upgrade of Indode port	150 10 160	Ports to complete customs clearing in the north to allow for direct export transfer	Goods can by-pass Addis and go directly to port	- Will take time to build and source funding - Skills to manage a port limited
Fleet	Additional fleet to carry expected demand capture	35 160 195	1,800 additional wagons and 65 additional locomotives	Fleet to meet demand	Funding limited and needs to be pre-paid to capture revenue
Total capex		482	Capacity utilization: - Maximise capture of trade flows to 50% of market - Increase diversity of customers on the line - Logistics partnerships or own end-end transport will be critical for agriculture		

The expected reduction in trade imbalance would further increase profitability and improve fleet utilization in the long run



Import/export balance vs. utilization and profitability %

Profitability Import Intra
Utilization Export



Irrespective of volumes captured, utilizing the fleet so that at least 40% of the return trip is carrying freight results in a 30% improvement in fleet utilization



To support the move towards profitability the current O&M contract might need to be renegotiated to set incentives to maximize volume optimization and staffing skills transfer adequately

Timeline

Current contract terms

Mid term

(1-6 years)

- EDR has a 6-year contract with management contractor for network and infrastructure operations
- Contract is for USD 357 Million over a 6-year period
- Management contractor service fee agreement with **a bulk upfront payment in the first 2 years**
- **Service fee not tied to volumes and capacity on line**
- **KPI's and skills transfer under TOR but not tied to service fee**

Long term

(6-10 years)

- Management contract ends and EDR to operate fleet with local staff (2,600 planned)
- EDR responsible for network maintenance of Addis – Djibouti line
- Concession agreement (not-signed) continues for an additional 22 years

Timeline

- | | | | | |
|--|--|---|--|--|
| <ul style="list-style-type: none">▪ Jan '18▪ Rail operations started in pilot phase under Chinese contractor | <ul style="list-style-type: none">▪ Jul. '18▪ Pilot program completed and transformation to EDR started▪ EDR staffing plan of 2,600 staff to be hired under way | <ul style="list-style-type: none">▪ Nov. '18▪ Skills transfer underway however not matching scheduled plan of 1,900 Ethiopia and 355 Djibouti staff to run operations | <ul style="list-style-type: none">▪ 2020▪ Addis-Djibouti to operate with 60% local team▪ 2,300 Ethiopia staff and 400 Djibouti staff to run operations | <ul style="list-style-type: none">▪ 2024▪ End of management contract for network operations and infrastructure maintenance |
|--|--|---|--|--|



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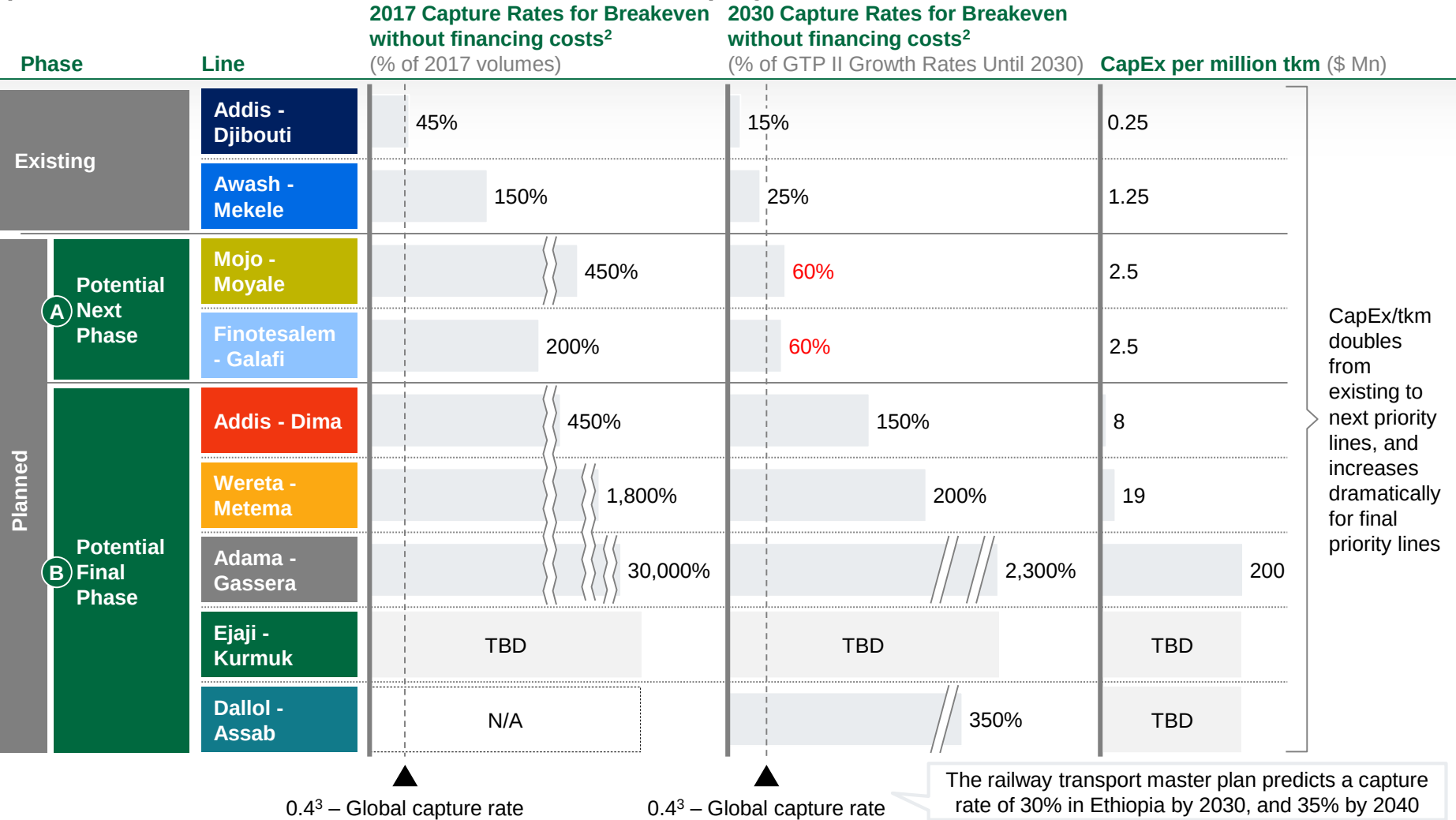
2

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2 Percent of total corridor flows necessary to breakeven along each line; based on EDR operating expenses and average CapEx from Awash - Mekele and Addis - Djibouti lines. Breakeven defined as revenue matching operating, maintenance, and rolling stock depreciation costs.

3 Average global model share of freight rail

SOURCE: McKinsey Rail Practice; Addis - Djibouti and Awash - Mekele feasibility studies; Rail Network Division; GTP II; OCP; Illovo

27

A

Recovering opex by 2030 is highly dependent on achieving optimistic GDP II projections, and capturing at least 60% of the traffic despite the construction of an express road; Servicing the debt (~\$235M in annual CapEx depreciation) is unlikely



Capture Volume
 Remaining Corridor Volume

2030 Base case

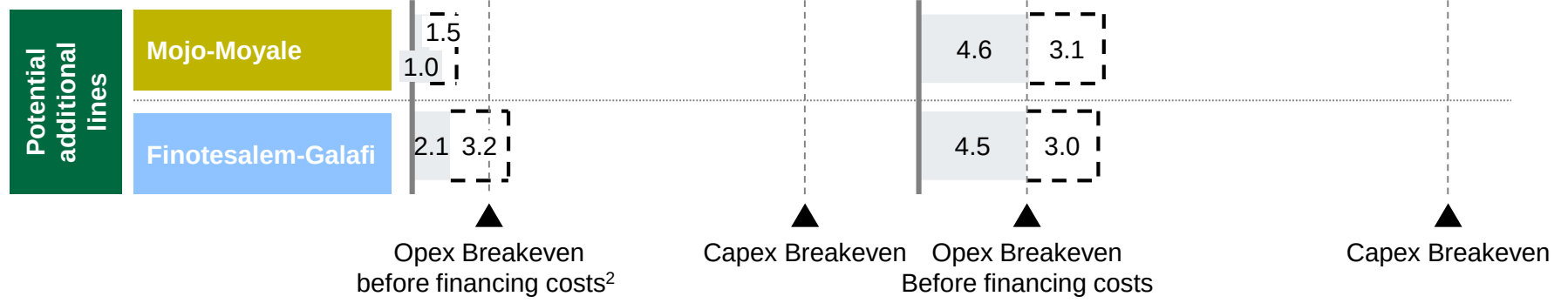
- No sugar production
- GDP growth
- 40% capture rate

2030 High case

- 3.5Mt of sugar production
 - GTP II projections
 - 60% capture rate
- Extremely unlikely given express road construction³

2030 Total Corridor Flows (MTPA)

2030 Total Corridor Flows (MTPA)



Financial implication on ERC

Both lines will generate operational losses, requiring government subsidy. The estimated annual subsidy required is

- **Mojo – Moyale:** ~\$110M
- **Finotesalem – Galafi:** ~55M

Both lines will generate operational profits excluding financing, but CapEx will require government subsidy. The estimated financials are:

- **Mojo – Moyale:**
 - Operational Profit before financing cost: ~\$1M
 - Annual CapEx Subsidy: ~\$135M¹
- **Finotesalem – Galafi:**
 - Operational Profit before financing cost: ~\$9M
 - Annual CapEx Subsidy: ~\$100M¹
- Given low operational profits, reaching profitability including financing is highly unlikely

¹ Assuming 50 year flat depreciation rate of infrastructure and ~5.7M USD/KM in total CapEx cost per line
² Breakeven defined as revenue matching operating, maintenance, and rolling stock depreciation costs

³ Express road to be built between Addis - Hawasa



B Unless conditions change, remaining lines have limited financial upside and should only be developed for development purposes. In which case, the government will need to subsidize both capex and opex for these lines.

Lines	2030 flows (Million Tons)	Annual OpEx ² subsidy (Million USD)	Total capex ¹ (Million USD)
Addis - Dima	2.6	72	3,653
Metema - Wereta	1.0	31	1,422
Adama - Gassera	0.1	38	1,422
Ejaji - Kurmuk	0	71	2,638
Dallol – Assab ³	0.9	57	2,412

If conditions change, e.g. new large scale extractive industry, strategic rail corridor to neighboring countries these lines might become more attractive

- Limited financial attractiveness of these lines, reducing financing opportunities through private capital
 - Assuming 40% capture rate, lines would incur **between \$30 - 70M per year in operating losses**

1 Assuming ~5.7M USD/KM in total CapEx spend

2 Breakeven defined as revenue matching operating, maintenance, and rolling stock depreciation costs.

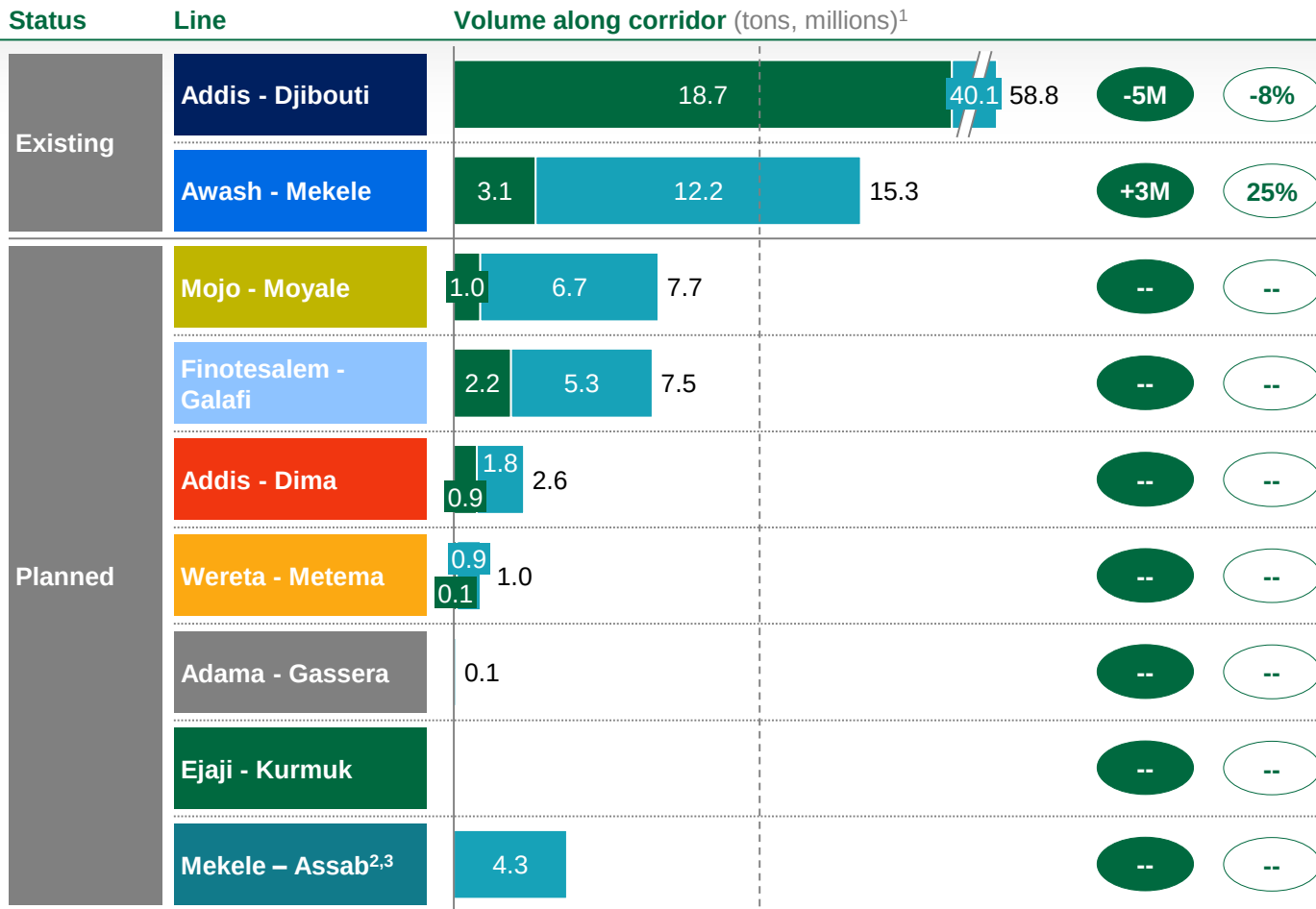
3 Includes only Potash for export, and assumes 100% capture rate



Based on the optimistic best case scenario

B Building a line from Mekele to Assab can shift volumes from Addis – Djibouti to Awash – Mekele, but no additional lines become viable

X% Total Change in volume (Millions) X% Percent change in volume 2017 Volume GTP II Growth Rates Until 2030



Average breakeven after financing costs

- Mekele – Assab line is **highly unlikely to be profitable after financing costs**
 - Breaking even against financing cost would require capturing ~12MTPA, or ~3x total corridor flows
- Creating a line from Mekele to Assab would shift volumes from Addis – Djibouti to Awash – Mekele
 - Awash – Mekele would gain ~3MTPA and Addis – Djibouti would lose ~5MTPA. Remaining volume travels on both corridors without line, and only Awash – Mekele with line
- Remaining lines are largely unaffected

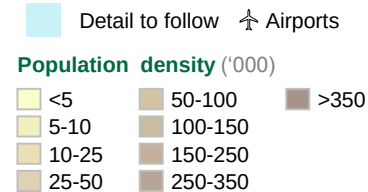
¹ Does not include potential for additional flows from connecting to ports (e.g., Port Kenya for Mojo – Moyale, Port Sudan for Wereta – Metema, etc.)

² Rail to Assab Port is not included in GTP II plans but has potential for consideration, especially given recent peace agreement with Eritrea

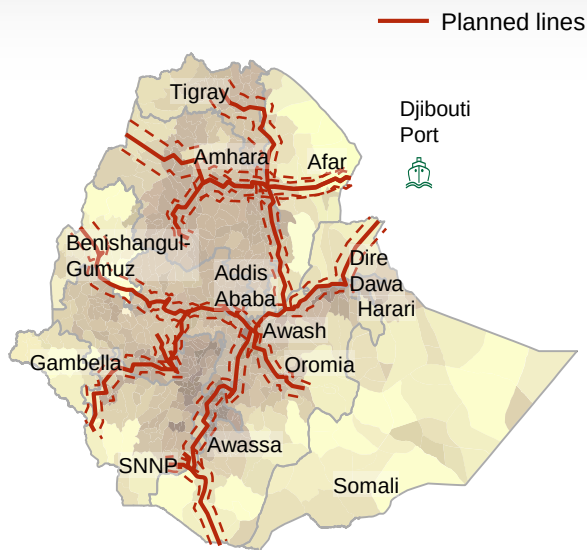
³ Assumes commodities with destination or origin north or Kombulcha shift from Addis – Djibouti to Mekele – Assab, plus 100% of Potash production (1.25MTPA)

Rail, road, and air work in parallel to provide social cohesion for the citizens of Ethiopia

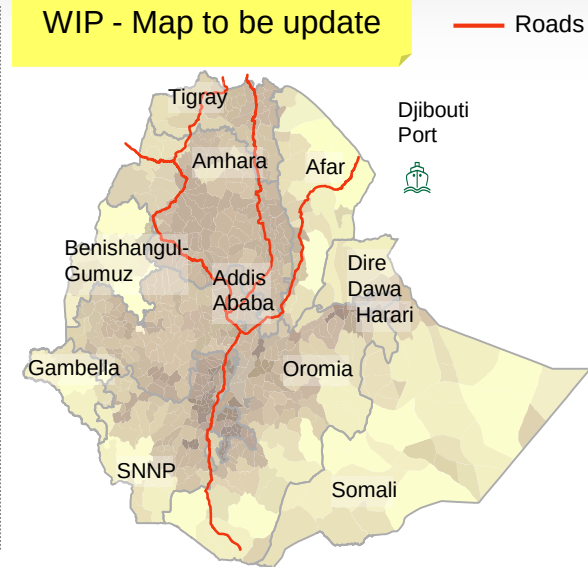
ILLUSTRATIVE



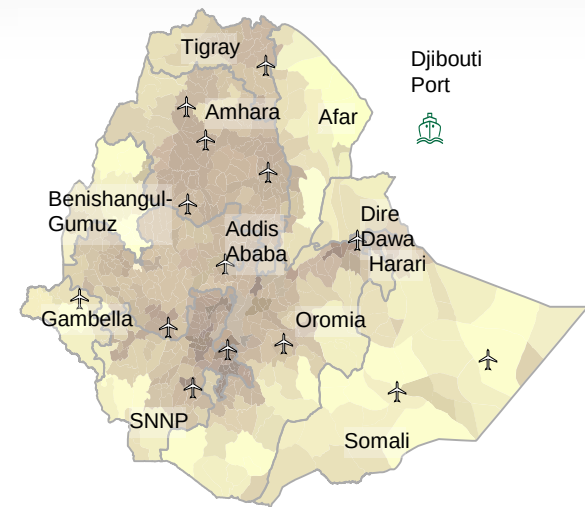
Population density around planned lines



Population density around existing roads



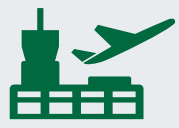
Population density around existing airports



Insight

- Disparate population and income challenges limit rail's ability to create social cohesion through transport, i.e., much of the population served by new lines in less developed portions of Ethiopia may not have the capital to travel on rail
- If ERC constructed the remaining planned lines, it would spend \$18-25Bn USD in order to potentially capture population already serviced by existing roads and airports if incomes allow without operational profitability for these new lines
- Alternative modes of transport may provide more impactful solutions than extending the rail network with more lines

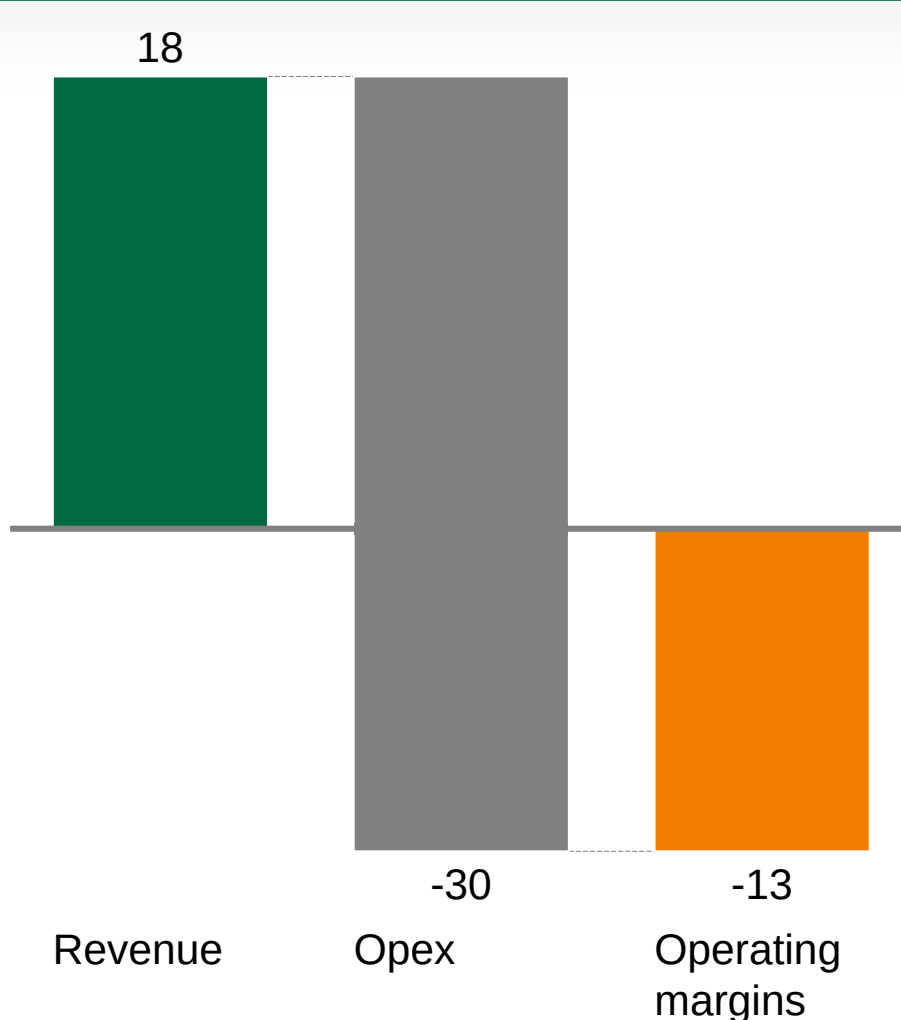
Alternatively to developing planned lines, the government could consider other modes of transportation to connect regions

Mode	Options	Comparison to Rail			Potential regions
		Pros	Cons	Costs	
Expand road network 	▪ Build new roads to connect the regions to the center ▪ Build linkage roads to connect regions directly	▪ High flexibility to connect to existing systems ▪ Could be leveraged for last mile logistics	▪ Low public visibility for the investment ▪ Could be more expensive for citizens to use	▪ Less expensive to build than rail ▪ May be more attractive to investors for PPPs	▪ Gambella ▪ East Addis Ababa ▪ Oromia
Expand air offering 	▪ Build new airports around mid-size population centers	▪ Faster to implement ▪ Stronger existing execution capabilities ▪ Higher public visibility for the investment	▪ Limited capacity (fewer trips at a higher cost) ▪ More expensive of an option for citizens	▪ More expensive than rail to build	▪ Benishangul-Gumuz ▪ East Addis Ababa

In all cases, passenger traffic contributes negatively to the P&L...

■ Revenue ■ Opex ■ Operating Margins

Unit economics, '000 USD/ train¹



Passenger transport value

Social

- Creates social cohesion between cities across the nation
- Addresses regional aspirations to develop rail
- Adds competition; driving down prices for passengers

Structural

- Creates additional transport supply
- Reduces congestion among road transport

Environmental

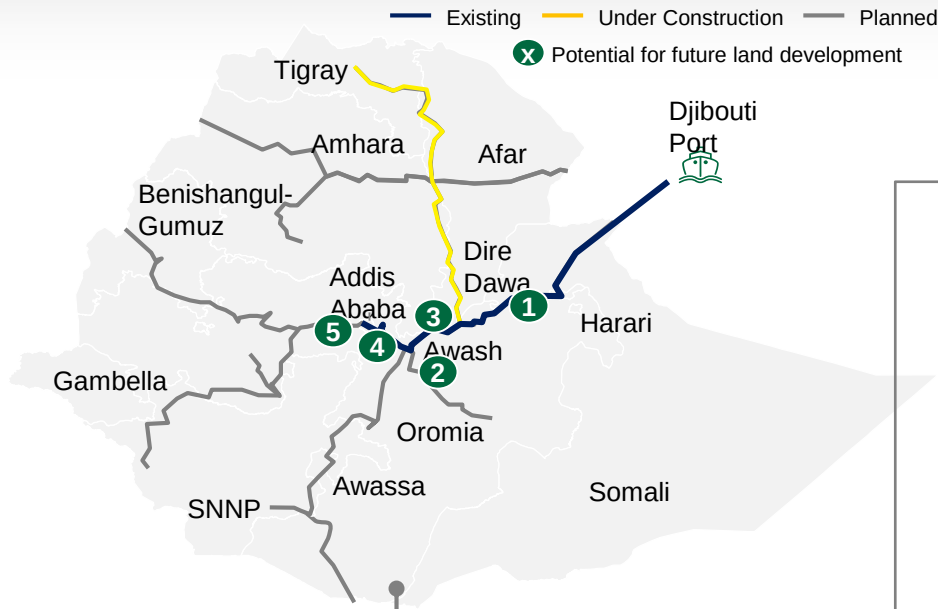
- Energy-efficient transportation
- In Ethiopia, uses clean energy rather than fuel

¹ Based on current freight and planned passenger revenues and trains run by EDR for Q2; freight includes empty and full trains.

² Based on EDR Performance Report, assuming 7 trains a day.

ERC can develop unused land at Dire Dawa, Adama, Endode, Lebu, and Sebeta, leading to ~\$260M in land appreciation

Potential Station Development Locations



Selection Criteria

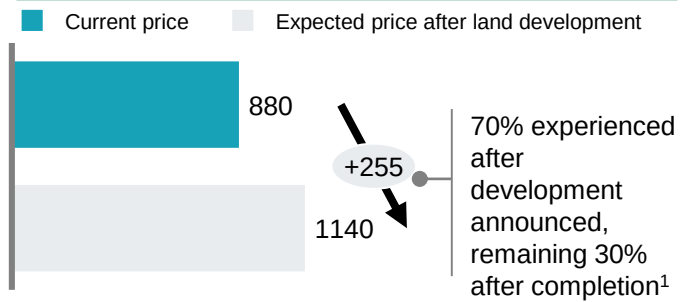
- **Proximity to population:** Successful land development depends on patronage of local population; cannot depend solely on passengers
- **Population income:** Population must be able to spend disposable income on goods/services offered at the location

Land Appreciation Potential

To maximize land appreciation from passenger stations, ERC should focus on locations with the following qualities:

1. **Connection:** Dense networks of streets and paths connected to the station
2. **Transit:** Development located near other high-quality public transport (e.g., busses from train station)
3. **Mix:** Plan for mixed use of station
4. **Densify:** Optimize density of surrounding area and transit capacity
5. **Compact:** Select regions with short commutes to station
6. **Shift:** Increase mobility around station by regulating parking and road use

Land appreciation around passenger stations¹ (USD Millions)



Land development around passenger stations is a benefit to offering passenger transport, but isn't high enough to justify building a new line

¹ Based on previous experience with city of population 10-12 million; national GDP/capita ~10,000 USD/person and land value of 3,200 Birr/square meter



ERC/EDR could improve achieve better financial and operational performance in the short and mid-term...

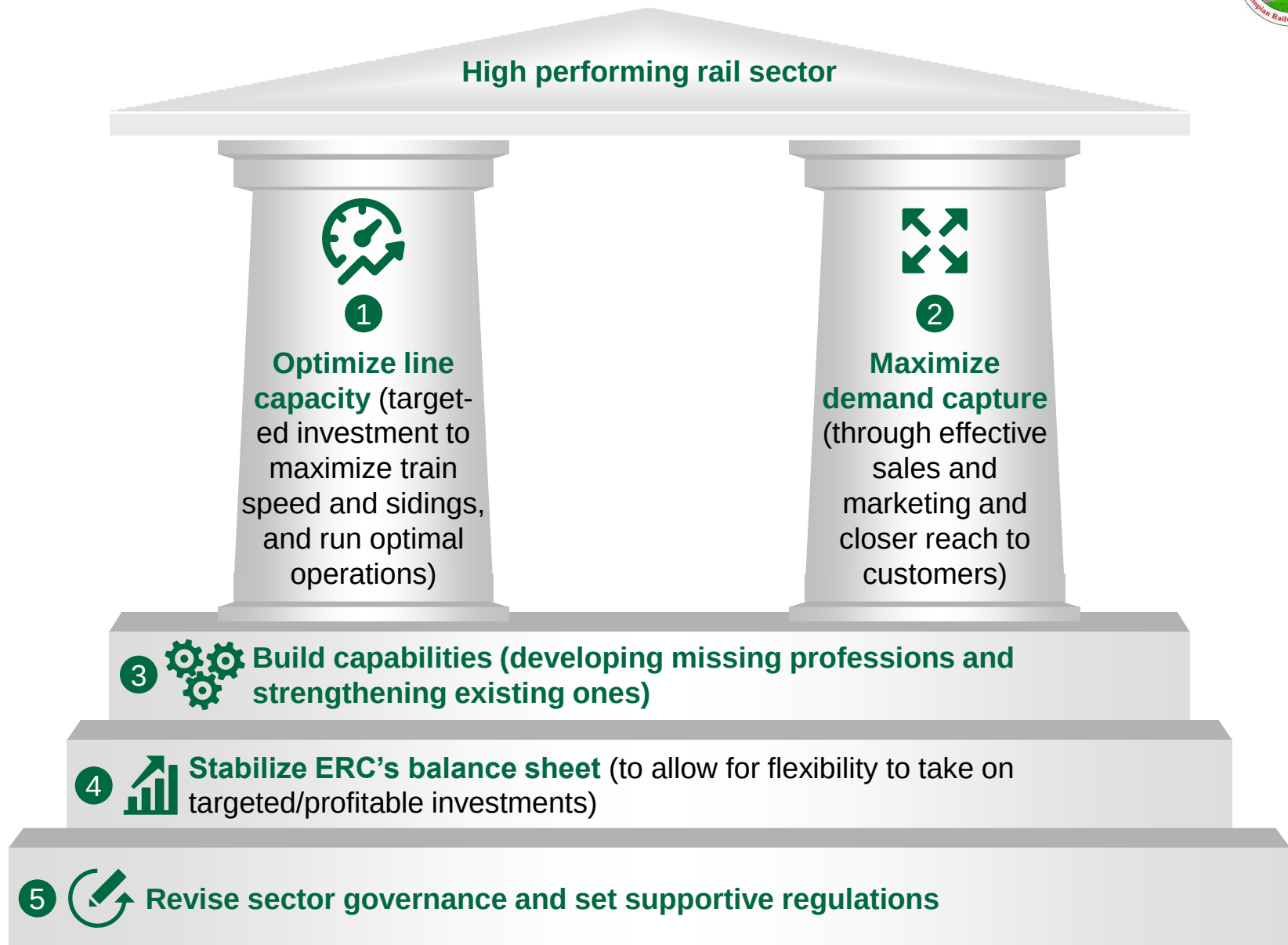
Focus of current transformation effort

What is the primary goal of this stage		“Maximize short term demand and develop critical capabilities” 2019-2020	“Set the stage for an efficient rail sector” 2020-2023	“Explore new frontiers” 2024-
		Maximize the capacity utilization to reach opex breakeven	Put in place the foundation for an effective sector	Expand line capacity and capture more demand
Output	Revenue ¹ (\$USD M)	250	350	600
	Additional capacity ³ (MTPA)	14	3	NA
	Additional volumes (MTPA) ²	9	4	9
Inputs	Capex (excl. Fleet) (\$USD M)	100	275 ⁵	NA
	Fleet investment (\$USD M)	160	35	NA ⁴
	Capability building	Leadership, rail operations through BOT, Commercial – pricing and contracts	- Station management and port operations - Real estate management	NA
	Regulations and sector governance	- Authorize competitive pricing - Revise sector governance	Land development around stations	Put in place new regulations

1 Based on projections of Addis-Djibouti and Awash - Mekele lines. Shows revenue from final year of period, and 2030 for last period use GDP projections and a 40% capture rate to project volumes
 3 Based on 1 passenger train a day and import only traffic

2 Based on base case projections for lines, which
 4 Additional fleet will be required to capture longer term volumes
 5 Additional investments on Awash-Mekele in the next couple of years could be deprioritized as in the short term the line could capture 1MT at most

... through a transformation program around 2 pillars and 3 enablers



The realization of rail potential in Ethiopia relies on line capacity optimization, and maximal demand capture, and is enabled by systematic capability building, a healthy balance sheet and supportive regulation and sector governance

Detailed next

Pillars



Line capacity optimization



- Line-wide capacity investment in infrastructure - An investment of US\$ 92 Million is needed to achieve the medium term capacity gain of 15MTPA on the line

Maximal demand capture



- To capture demand, investment in sales and marketing, depots and links to the fertilizer factory will be needed while providing end-end logistics
- Strategic sales and marketing** : Develop sales and strategic marketing activities to capture the natural market for rail
 - Being allowed to price at bulk at "bulk switch prices" for target goods and sources – a 75% drop vs today's price in main commodities and further 35% drop in up export grade" commodities
 - Being allowed to propose to traffic sources a full logistics service pick up from plant, with trucking a sub-supplier and road as a traffic feeder to rail heads;
- Client or rail-head specific investment** in private sidings, last mile to port and handling facilities
- Additional fleet** to meet customer demand

Capability building



- Build the capabilities required to support the ramp up plan
 - Develop key professions currently missing (sales and marketing – including pricing; station management, depot management; network operations; real estate) while reinforcing existing functions (financing and strategic investment; operations; contract management)
 - Develop leadership capabilities missing skills within existing staff for the new organization and operational skills to be transferred from the management contractor
 - Create the required HR systems (performance management systems, supporting tools and systems)

Stabilized balance sheet



- The government to carry out the existing debt on its balance sheet in order to allow ERC to invest in the profitable investment required to reach the potential of existing lines

Enablers



Sector governance and Regulations

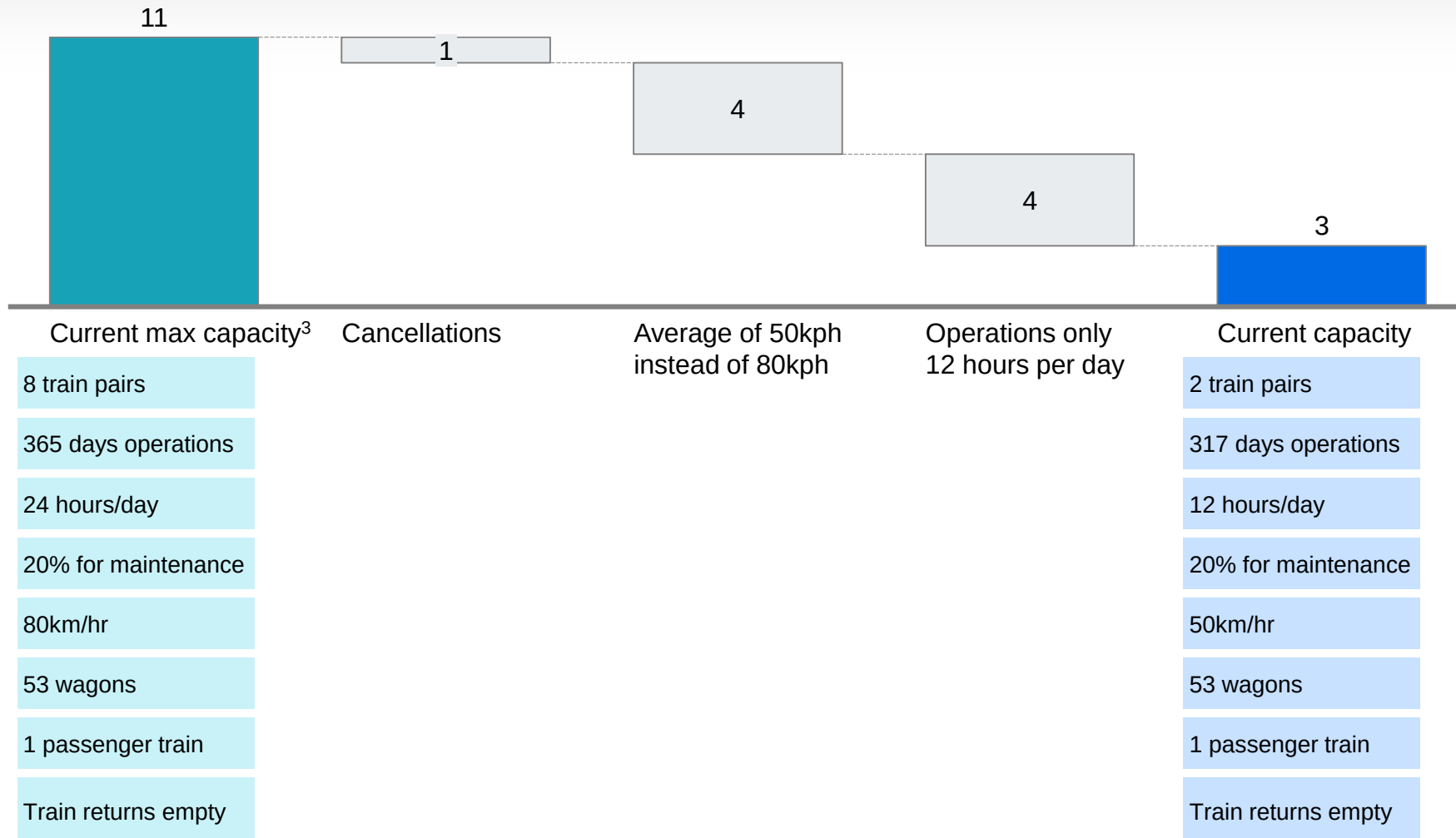


- Sector governance** : the Ethiopian government should revise the current sector governance structure as it presents multiple critical challenges
 - Incentives aren't put in place to maximize the sector value creation (e.g. operator also managing the infrastructure)
 - Duplicated resources as ERC and EDR are both expected to manage different parts of the infrastructure
- Regulations** – the Ethiopia government could further support the development of the sector through
 - Regulations to support the attractiveness of rail (including authorizing strategic pricing for rail)
 - Land development around passenger stations through PPP or concession models



Currently, the rail operates at only ~3MTPA capacity², driven by a limitation on night operations, speed due to security and illegal line crossings and train cancellations

Current line losses, MTPA



1 Based on 2-way traffic, actual capacity is half this due to import/export imbalance

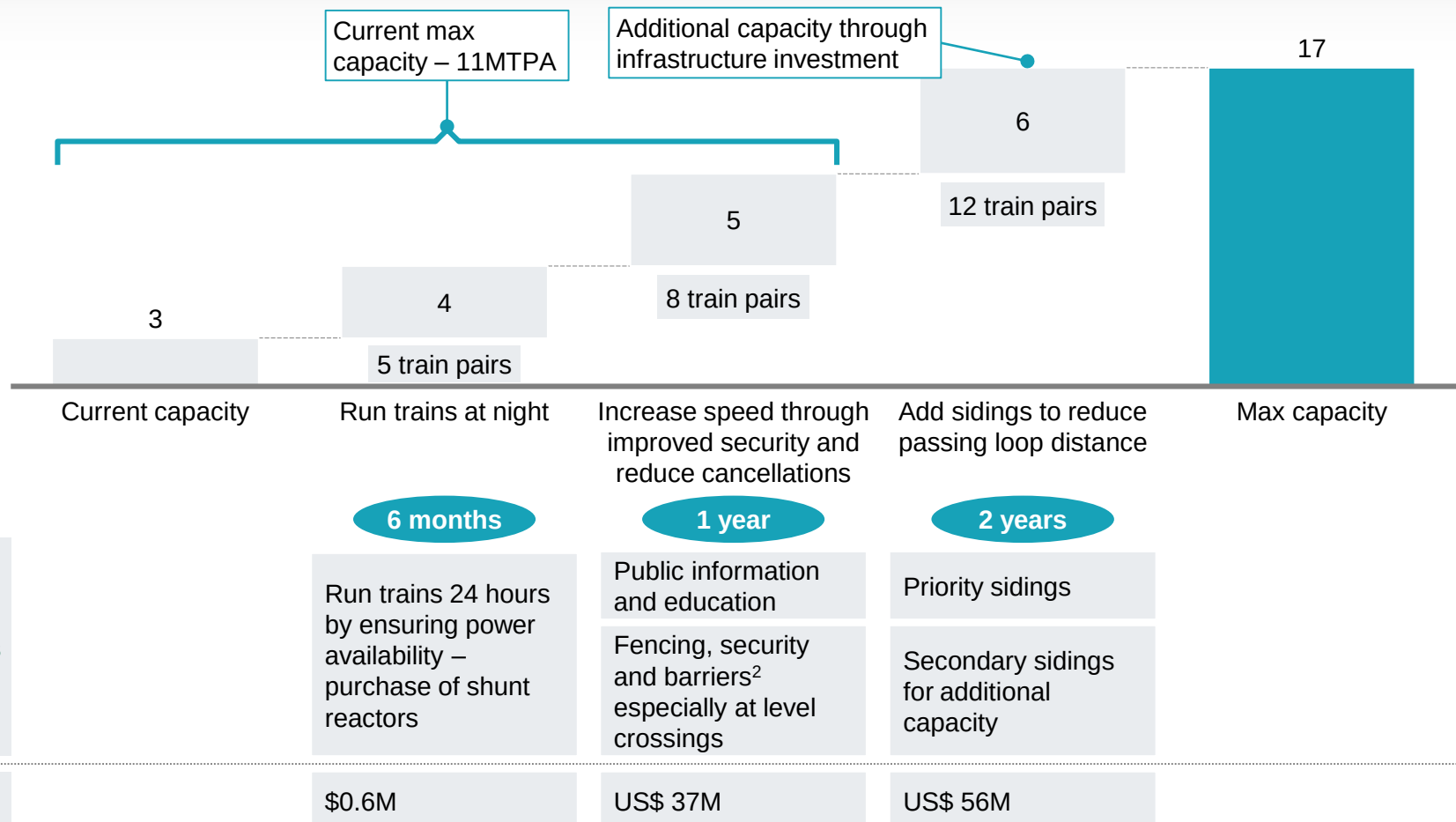
2 based on current import/export ratio of 85-15%

3 Model assumes scheduling based on bottleneck optimized shceduling

Capacity could be extended by several interventions with increasing investments required. The fastest and cheapest capacity increase would be to operate at night (with reduced speed)

Current and maximum line capacity, MTPA

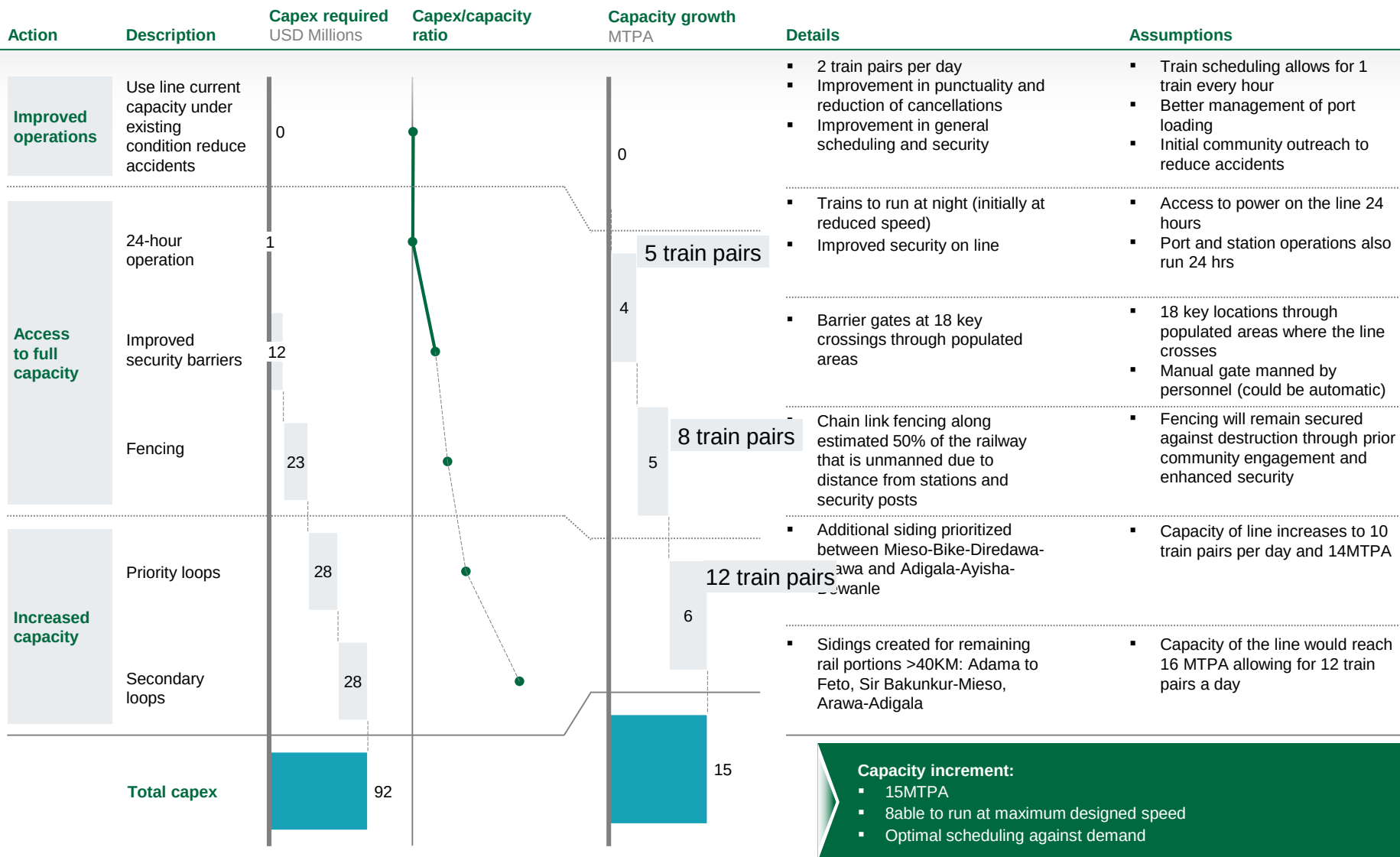
— Total capacity XX MTPA



1 Based on import traffic only

2 This is an external perspective not factoring in community intrinsics that would require local knowledge

An investment of ~US\$ 90 Million is needed to achieve the medium term capacity gain of 15MTPA on the line



The realization of rail potential in Ethiopia relies on line capacity optimization, and maximal demand capture, and is enabled by systematic capability building, a healthy balance sheet and supportive regulation and sector governance

Detailed next

Pillars



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Enablers



Sector governance and Regulations



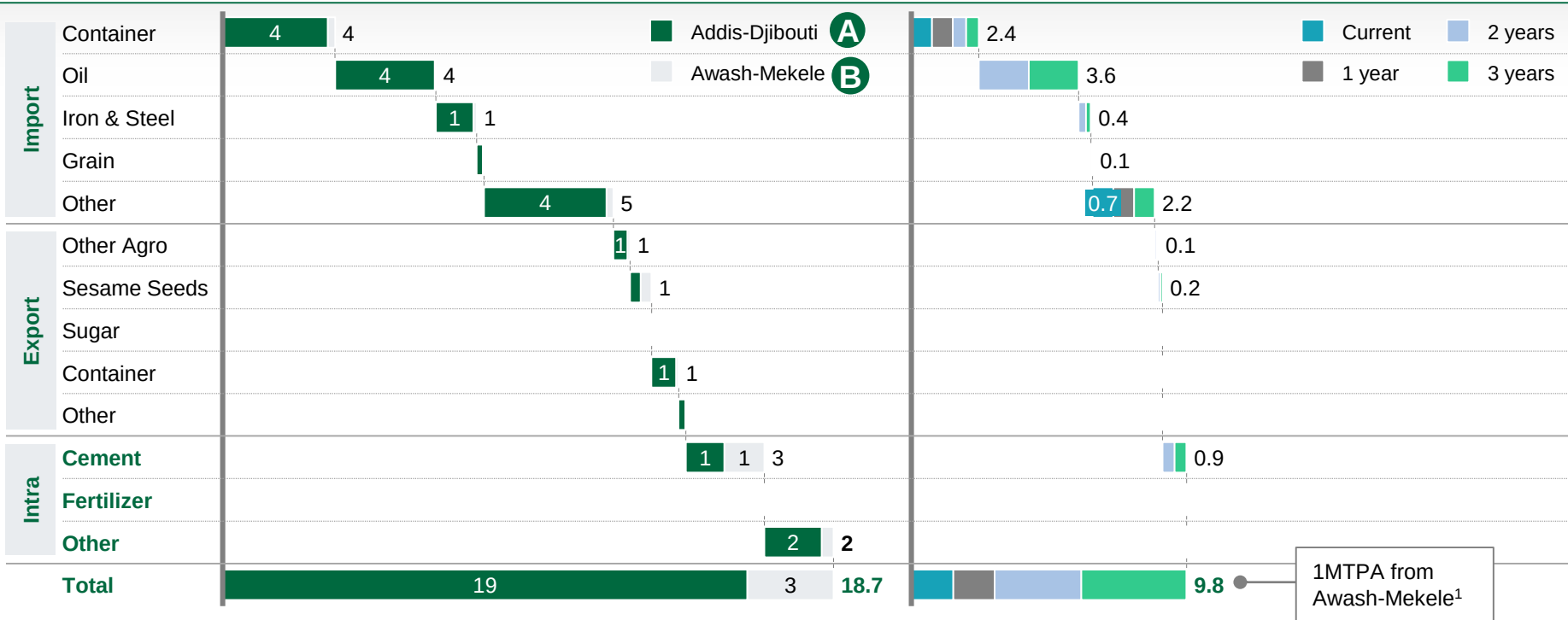
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ERC could capture ~50% of current trade flows for bulk goods and containers that naturally belong on rail through revising the pricing policy and end-to-end customer logistics

Total current flow, Mt per year

Current and planned demand capture transported, Mt per year



Rationale	- Optimize current fleet utilization on import and export - Build on steel transport - Capture oil transport in 1 year - Focus on capturing dry bulk agricultural products for export
Requirements	- Pricing strategy for bulk commodities for export to compete reasonably with rail - Focus on capturing bulk agriculture customers in Tigray, SNNP etc - Freight sales unit to diversify current customers for the rail to include international shipping lines and private freight forwarders - Linkages to major export manufacturers and industrial parks

¹ Will depend on when Awash-Mekele operations start
 SOURCE: Ethiopia trade flows, team analysis

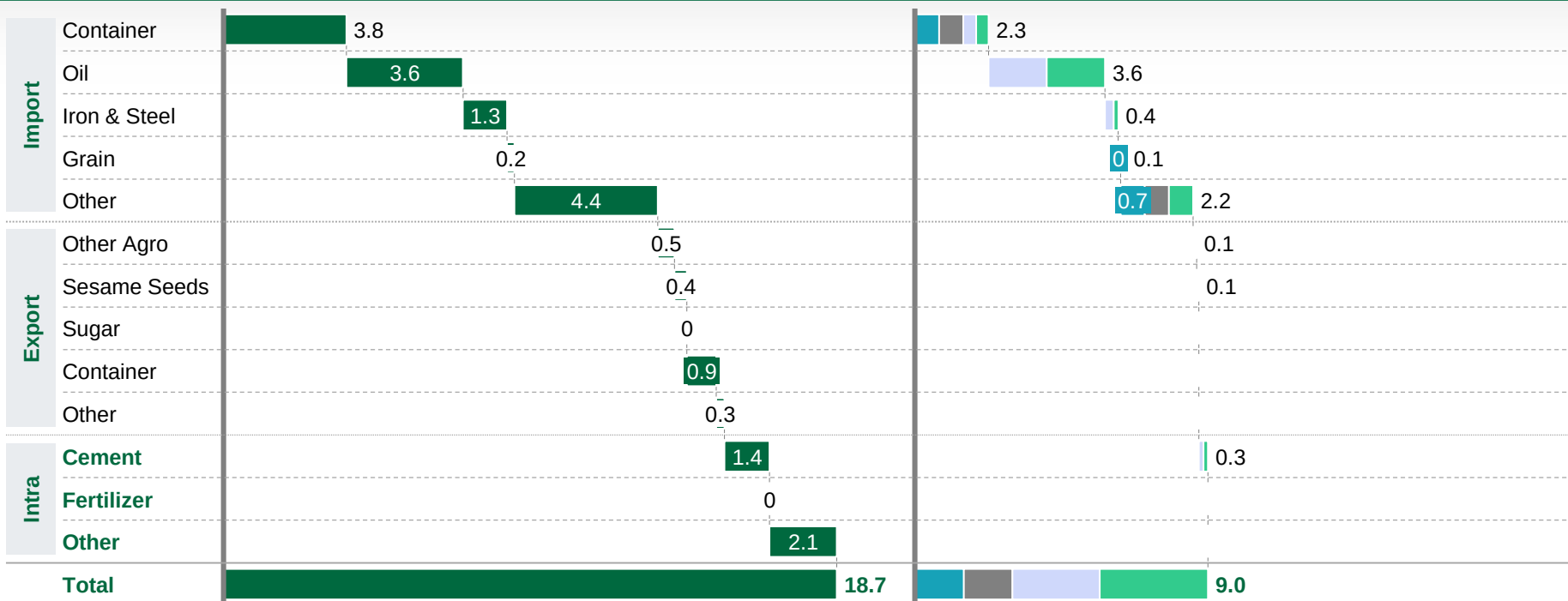


A ERC could capture ~50% of current trade flows for bulk goods and containers that naturally belong on rail through revising the pricing policy and end-to-end customer logistics

Current 1 year 2 years 3 years

Total current flow, Mt per year

Current and planned demand capture transported, Mt per year



Rationale

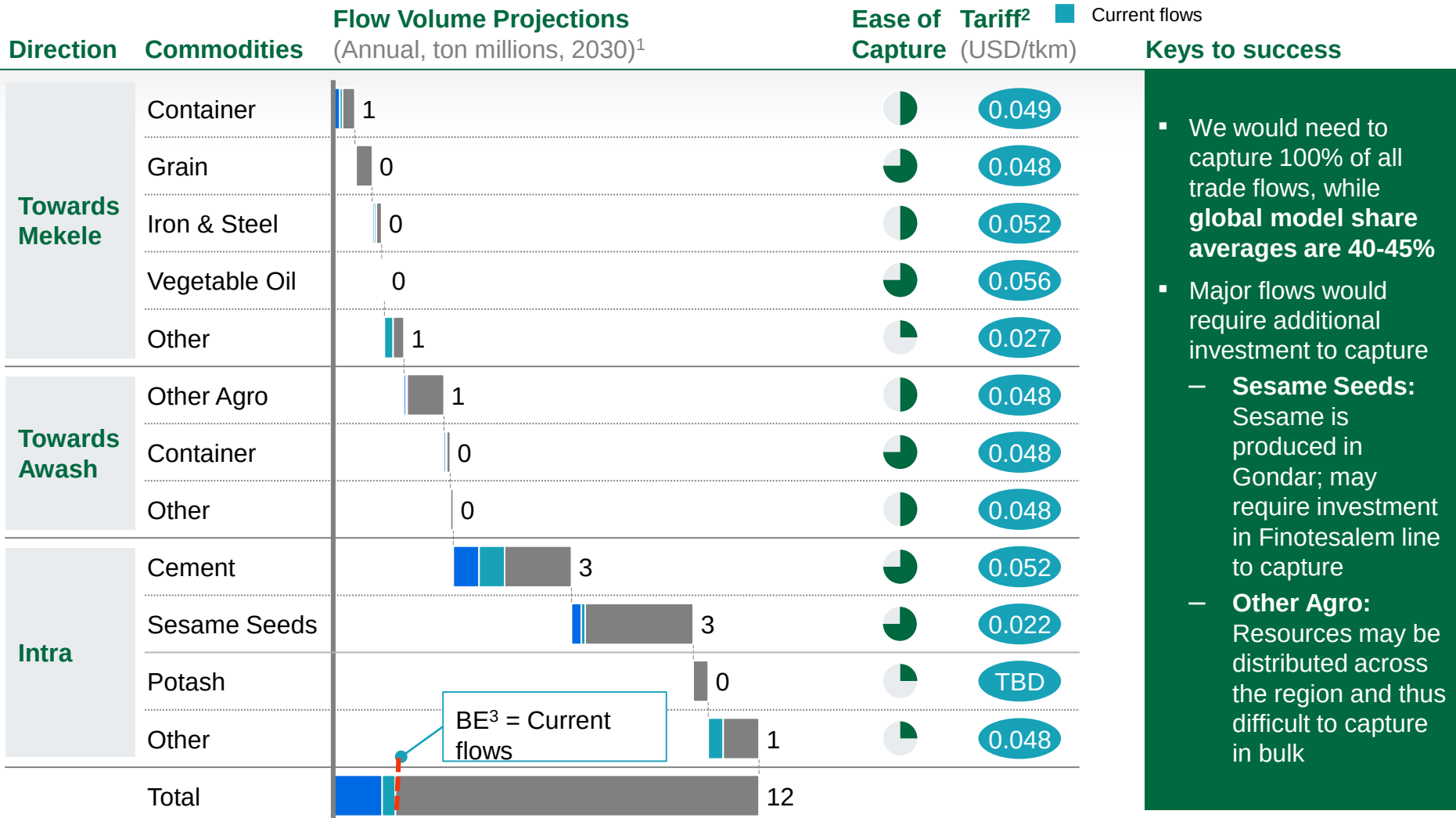
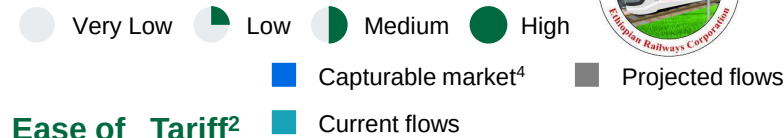
- Optimize current fleet utilization on import and export
- Build on steel transport
- Capture oil transport in 1 year
- Focus on capturing dry bulk agricultural products for export

Requirements

- Pricing strategy for bulk commodities for export to compete reasonably with rail
- Pricing to capture empty containers returning to Djibouti port
- Freight sales unit to diversify current customers for the rail to include international shipping lines and private freight forwarders
- Linkages to major export manufacturers and industrial parks



B To break even on the Awash – Mekele line all possible trade flows would need to be captured



¹ Based on Real GDP/Capita Growth Projections, Oil Demand Growth Projections, Fertilizer Capacity Projections, and Industrial Park Productivity Projections

² Some tariffs are based on averages due to lack of data, namely: Potash, Grain, Vegetable Oil, Textiles, Leather, Cement

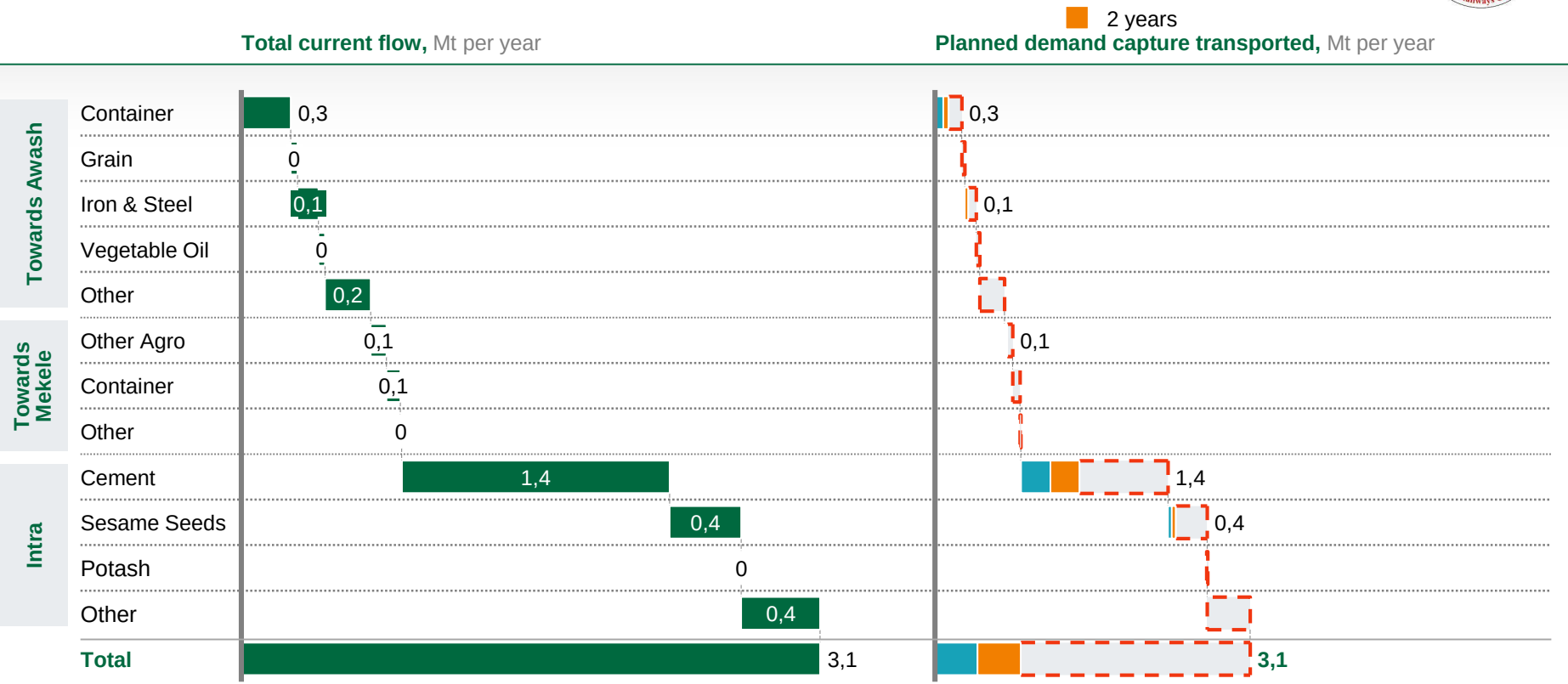
³ For the line to breakeven we would need to capture 100% of current flows

⁴ Capturable market refers to flows that traditionally are best suited to rail including bulk dry agriculture and cement

SOURCE: Ethiopian Revenues and Customs Authority, Operations Control Center, McKinsey Analysis



B Capture of dry bulk goods like cement and bulk agriculture should be the focus for flows on the Awash line



Rationale

- Dense goods make most sense for rail transport over long distances
- Potash is at a single location making it easy for point-point transport

Requirements

- Focus on business development for agriculture in Tigray area
- Direct contracts and end-to-end transport solution for cement factories
- Long term pricing to force rail traffic with potential reductions/ concessions for volume exports



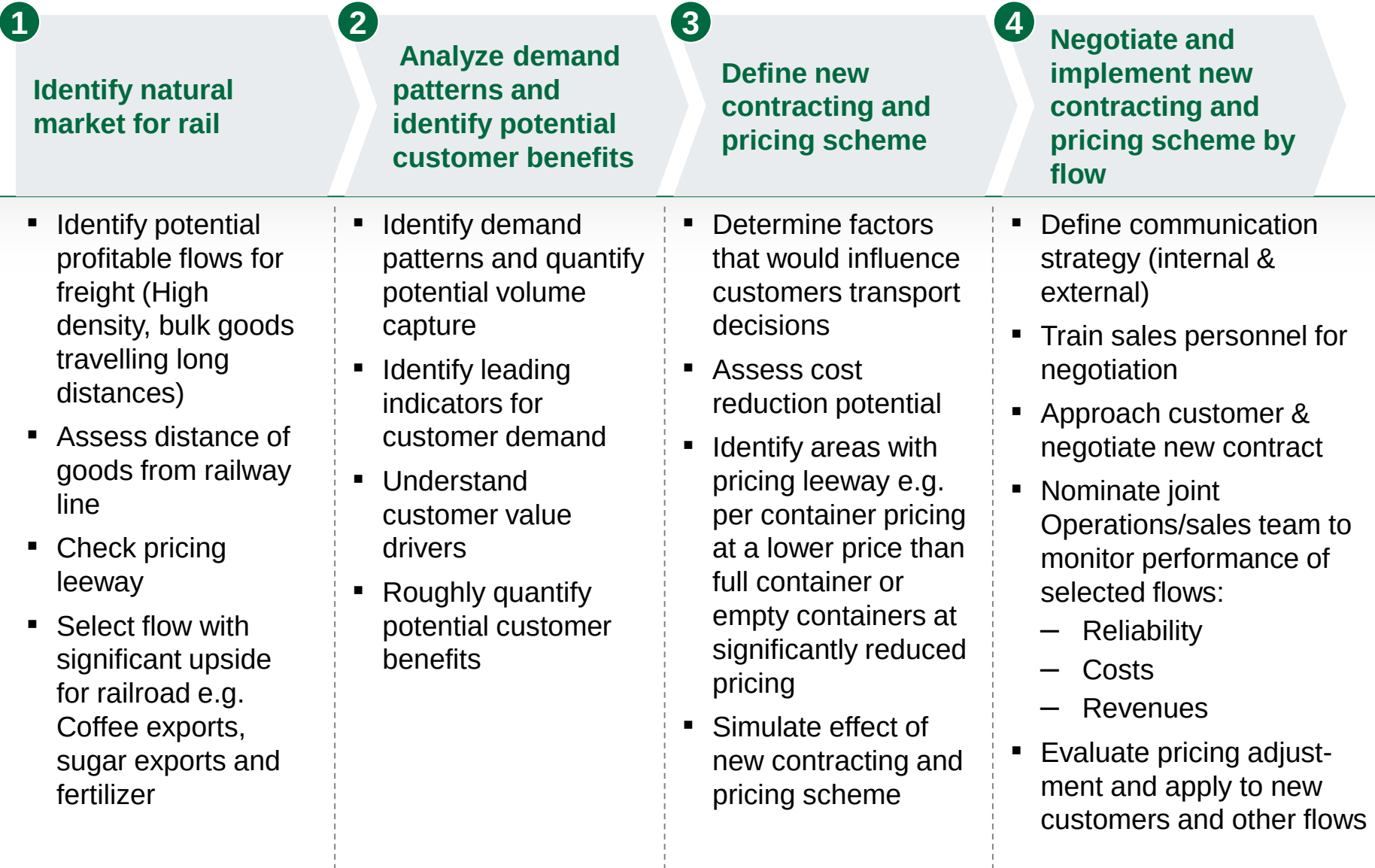
To capture demand, investment in sales and marketing, depots and links to the fertilizer factory will be needed while providing end-end logistics

■ Addis Djibouti ■ Awash Mekele

□ Focus on the next pages

Action	Description	Capex required USD Millions	Details	What	How
BD/ Marketing sales units	Create an internal unit for development of relations and business for freight transport. Marketing and sales initiatives through freight expos	1	- Creation of a separate BD unit within ERC focusing on 4 stakeholders of freight - Track access sales to independent operators	- Local skill development - Direct management of revenue drivers	BD strategy and focus on sales as a priority
3PL logistics	Invest in an in-between logistics transport system for rail head to depot transfers	1	Contracts with freight forwarders and 3PL partners for end-to-end goods transfer	Provide end to end freight logistics for the region	Partnering with local 3PL companies
Link turnouts to key importers/ exporters	Link lines to key importers/exporters e.g. cement and fertilizer	125	Connect last mile to fertilizer factory and cement	Reduced freight cost for rail should drive higher volume	Funding can be sourced through private investment
Inland dry ports	Set up inland port at Kombulcha and upgrade of Indode port	150 10 160	Ports to complete customs clearing in the north to allow for direct export transfer	Goods can by-pass Addis and go directly to port	Temporary outsourced to build internal skills
Fleet	Additional fleet to carry expected demand capture	35 160 195	1,800 additional wagons and 65 additional locomotives	Fleet to meet demand	Priority delivery of already purchased fleet
Total capex		482	Capacity utilization: - Maximise capture of trade flows to 50% of market - Increase diversity of customers on the line - Logistics partnerships or own end-end transport will be critical for agriculture		

A pricing strategy for freight can be implemented through four steps in order to compete with road and capture freight volumes



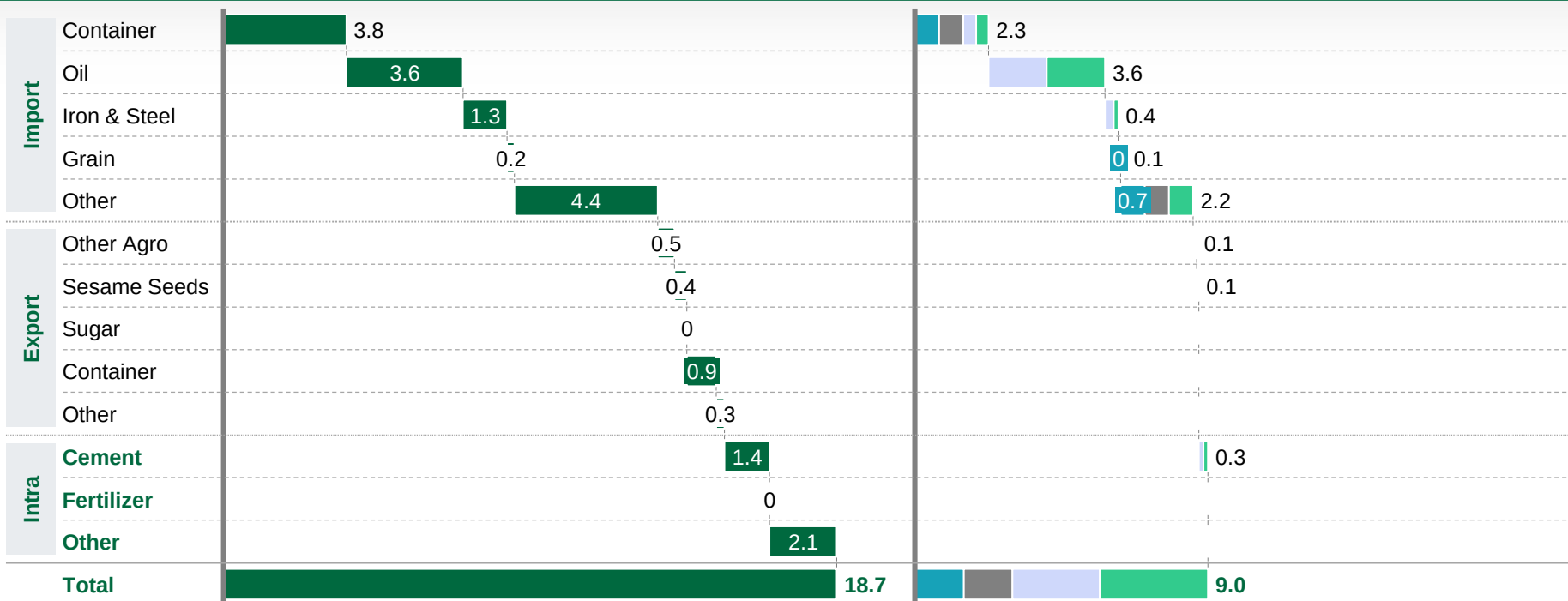


ERC could capture ~50% of current trade flows for bulk goods and containers that naturally belong on rail through revising the pricing policy and end-to-end customer logistics

Current 1 year 2 years 3 years

Total current flow, Mt per year

Current and planned demand capture transported, Mt per year



Rationale

- Optimize current fleet utilization on import and export
- Build on steel transport
- Capture oil transport in 1 year
- Focus on capturing dry bulk agricultural products for export

Requirements

- Pricing strategy for bulk commodities for export to compete reasonably with rail
- Pricing to capture empty containers returning to Djibouti port
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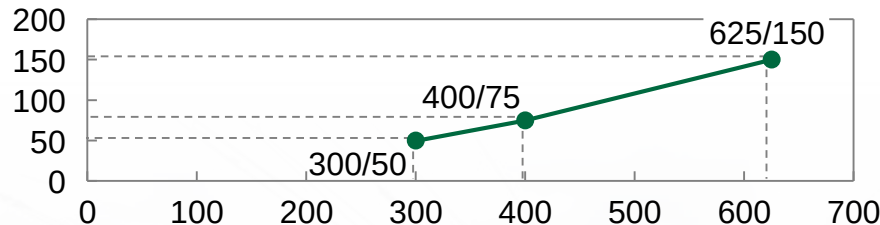
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Rail can be economically competitive vs. alternatives in freight transport for dense, bulk goods and massive volumes



Freight

Distance from rail, km



Total transport distance in which rail is competitive, km

The farther the customer is from the rail head, the longer distances the cargo needs to travel for rail to be competitive

Ponderous products (i.e., high density, nonperishable)



KPI: density, average wagon weight

Massive



Rail is more competitive in the transport of high volumes of products

- Dense goods travelling over 300 Km naturally belong on rail
- Even if goods are 150 Km away from the rail head, if they have to be transported over 600Km it would be more economical to transport them by rail
- The pricing horizon to attract these natural flows needs to be determined to identify
 - What the price drop would need to be to compete against road
 - What cost savings can be put in place to improve overall profit

Distance traveled

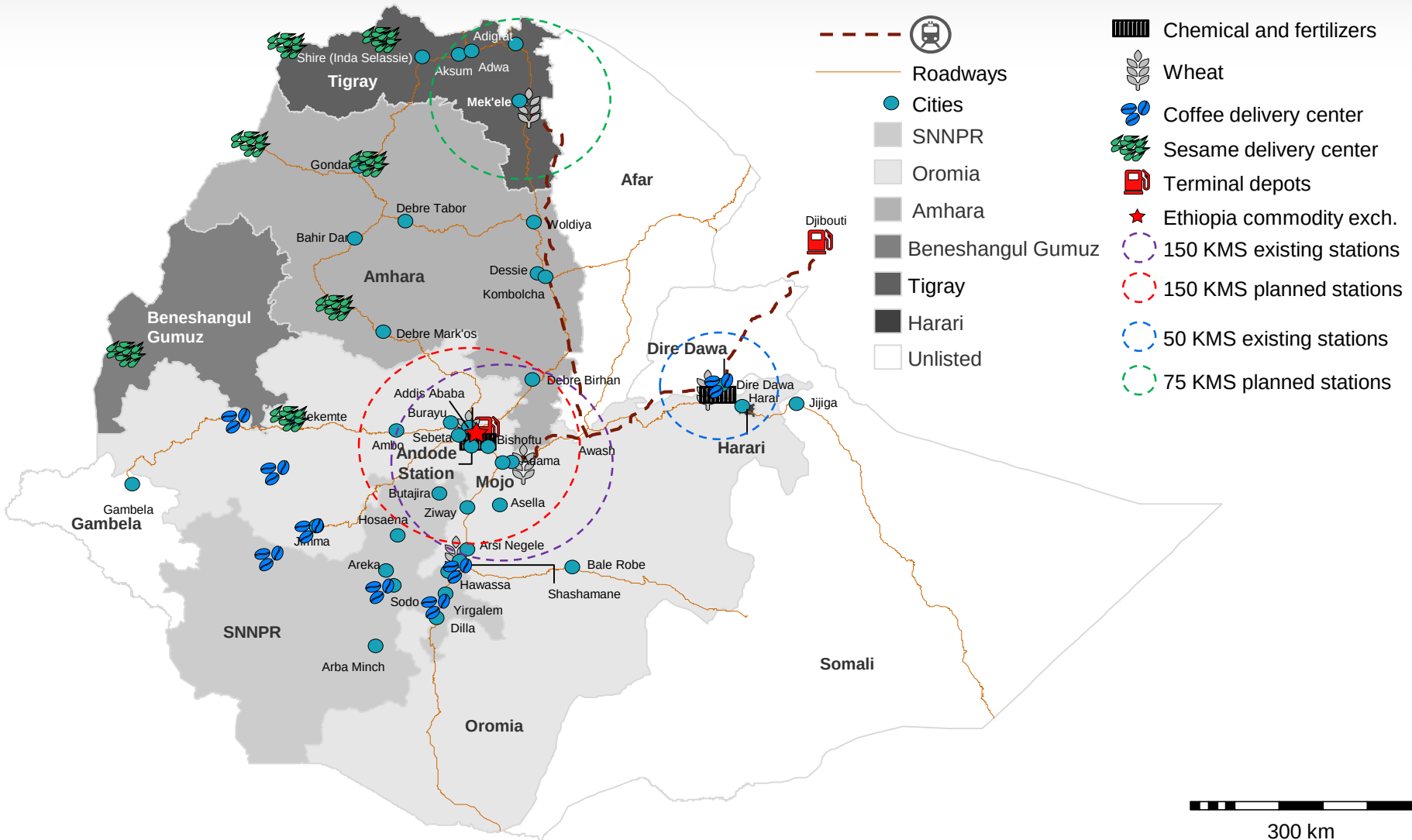
Products transported

Volume of traffic

1 Footprints of productions sites and distance from rail and roadways



Map of Ethiopia showing location of main production areas

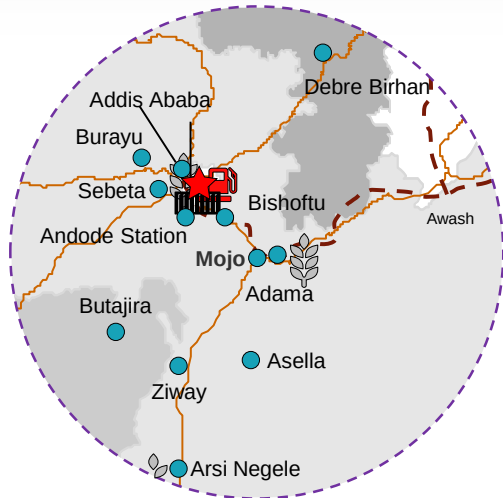


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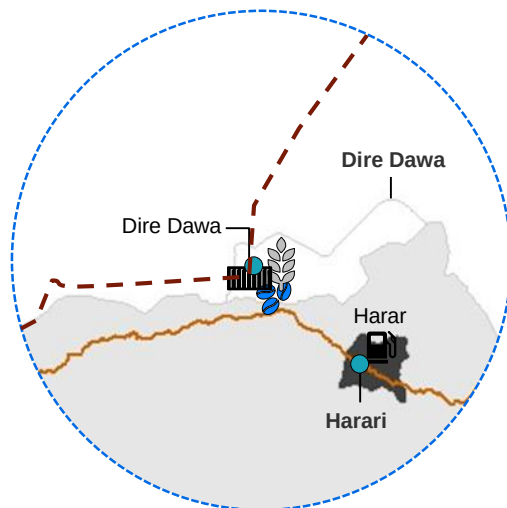
Within a 150Km radius of Mojo and 50Km of Dire Dawa there is opportunity to capture oil, wheat, coffee, sugar and fertilizer flows



150 Km radius around Mojo



50 Km radius around Dire Dawa



- Chemical and fertilizers
- Wheat
- Coffee delivery center
- Sesame delivery center
- Terminal depots
- Ethiopia commodity exch.

150 KMS

50 KMS



Roadways

Cities

SNNPR

Oromia

Amhara

Beneshangul Gumuz

Tigray

Harari

Unlisted



150 km

Flow details

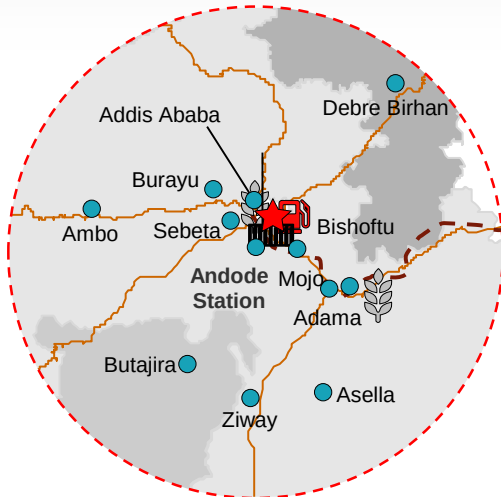
- The Ethiopia commodity exchange acts as the centre for coffee, sesame, beans, maize and wheat from around Ethiopia and is 80Km from Mojo
- The fertilizer factory in Dire Dawa will be less than 10 Km from the Addis-Djibouti line

1

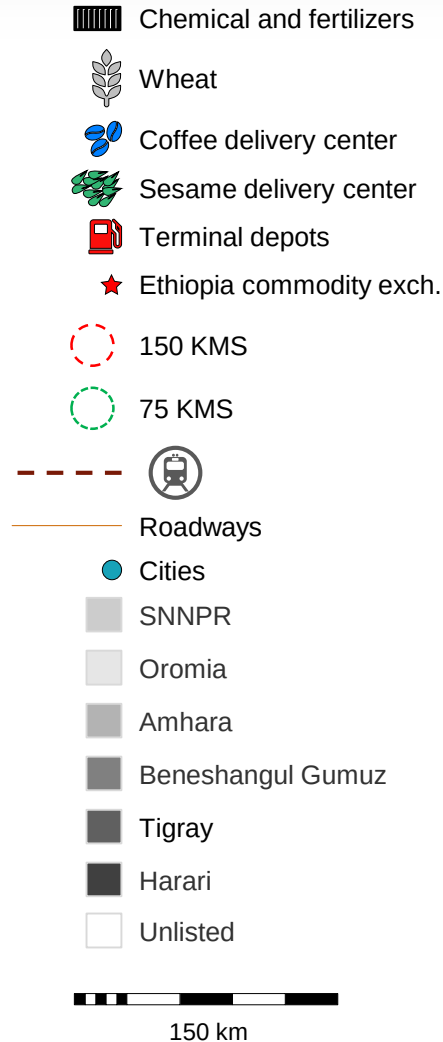
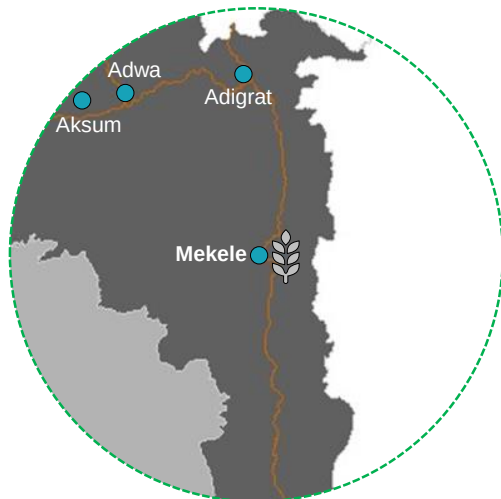
Within a 150Km radius of Indode there is opportunity to serve the Ethiopia Commodities exchange while within 75Km of Mekele there is grain and cement



150 Km radius around Andode



75 Km radius around Mekele



Flow details

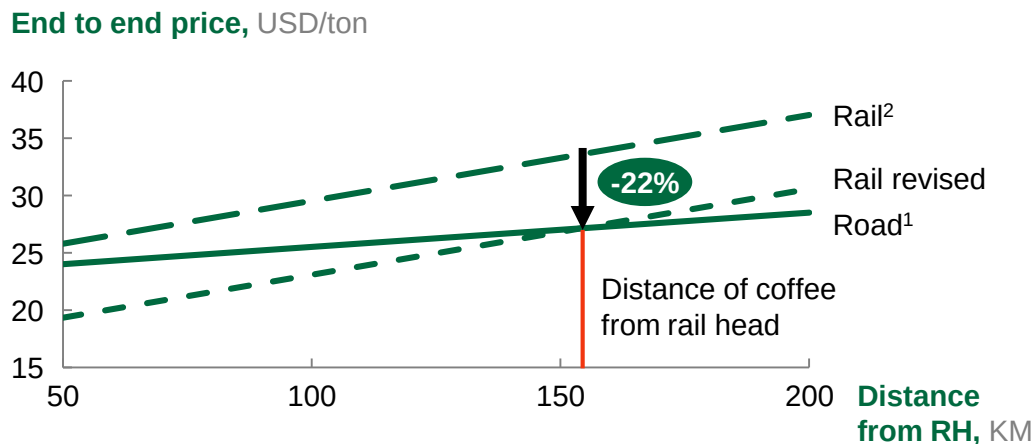
- Andode will be even closer to the commodities exchange and with the new link road a good trucking partnership would allow for capture of all bulk grains and seeds in the region
- Oil seeds and grain from the Tigray area are transported by road along the highway passing through Mekele
- There are two cement factories within Mekele that contribute over a million tons per annum for use in the construction industry within Ethiopia

3 To capture additional traffic through end-to-end pricing we would need to reduce rail pricing to compensate for road costs

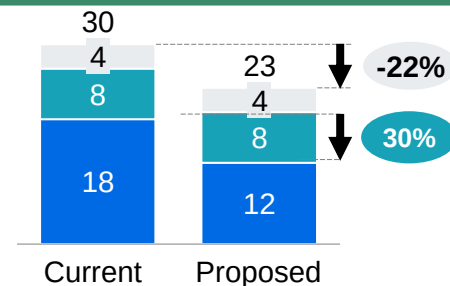


Pricing Horizon – Export coffee assuming 625 km distance

Example pricing horizon for coffee export



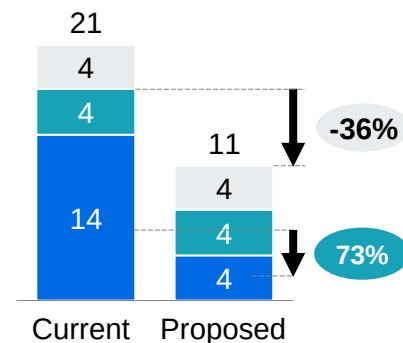
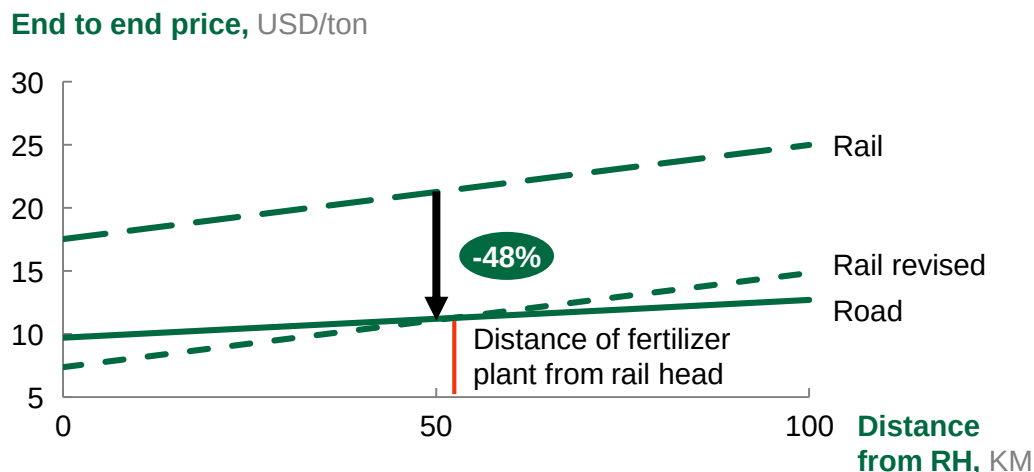
End to end price, USD/ton



30% Drop in rail price with a total price drop of 22% would allow us to capture coffee within 150Km of the rail head

Pricing Horizon – Import Fertilizer assuming 335 km total distance

Example pricing horizon for fertilizer import to Dire Dawa



73% Drop in rail price with a total price drop of 36% would allow us to capture fertilizer delivery within 50Km of the rail head

1 Road pricing at a fixed cost per ton-km, not factoring in variances by end-to-end location as data not available

2 Rail pricing at fixed price per ton-km as per current pricing tariffs

At current pricing we cannot capture freight due to road competition, reducing pricing allows more freight capture at a lower margin. Through capex investments we can reduce total cost and increase margins



End to end price – current



High rail price e.g. 28\$/ton

High cost, long distance

double reloading costs

Current end-to-end pricing is not competitive, limiting freight capture rate.

End to end price – reduced rail price



Reduce rail price e.g. to 18\$ per ton

Trucking costs still high due to distance

double reloading costs

More competitive pricing by reducing rail price will increase capture rate but decrease profit due to high costs for additional logistics

Invest capex in link line to reduce overall cost – price remains the same



Rail price remains at reduced level

Trucking costs reduce greatly or can be eliminated by direct link

loading can be eliminated if direct link

Reducing operating costs through capex investments into link lines will increase overall profit

3 The line is not able to capture volumes due to high end-to-end prices, by decreasing total price additional demand could be captured. Investing capex in specific sidings could increase profit

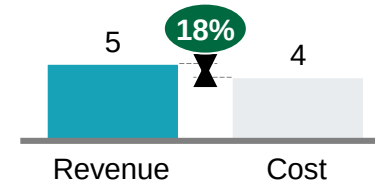
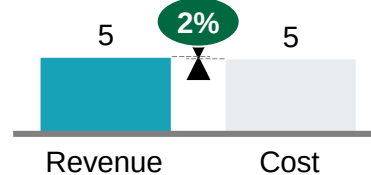
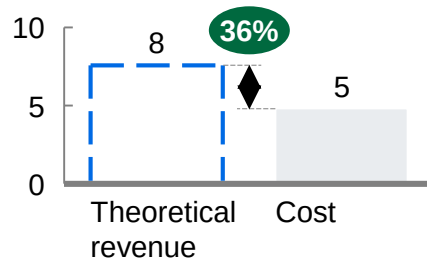
USD millions

Revenue lost due to market not captured

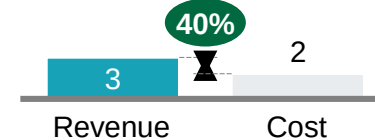
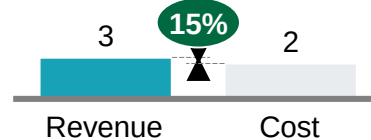
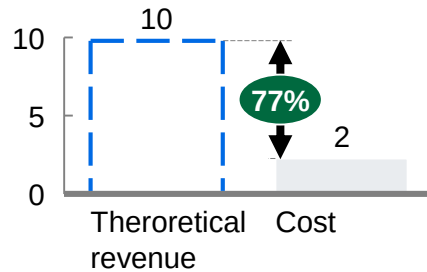
Revenue potential through reduced pricing

Profit if costs reduced through capex investments

Impact of pricing and revenues – coffee



Impact of pricing and revenues – fertilizer



- Current rail price per ton-km includes road cost
- Assumes volume that currently is not being captured

- Revised pricing based on % drop calculated
- Road cost remains the same

- Price remains the same
- Costs could decrease due to capex investments into sidings.

- 1) The line currently is not realizing the first level of profitability as it can't capture the volumes shown due to being outpriced by road
- 2) By reducing rail freight pricing to provide an end-to-end pricing competitive with trucks, the rail would still be profitable
- 3) Profitability could be increased by Capex investments into sidings to reduce road distance and through truck contracts to reduce road haulage costs

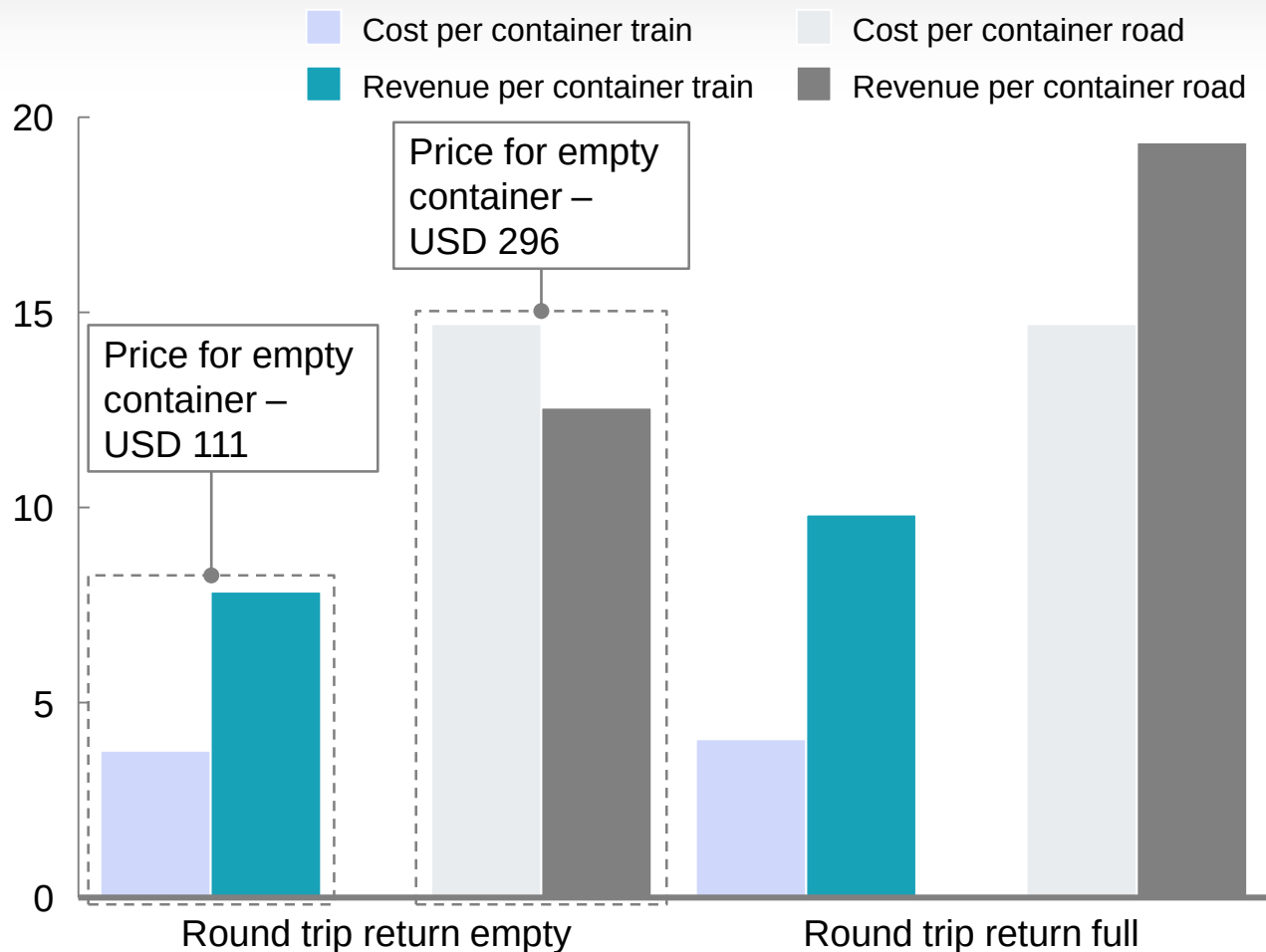
3

It is not profitable for road to carry empty containers back, rail could increase its pricing for empty containers and still compete with road



Cost and revenue for 1 container by road and by rail

USD



- Empty containers are charged per unit on the return journey with rail charging 2.5 times more than road
- Due to net volume it is still profitable for rail to transport emptied while for road, despite the high prices, the cost is subsidized by the incoming journey
- Rail could increase its pricing for empty containers on the return journey and still compete with road



To capture demand, investment in sales and marketing, depots and links to the fertilizer factory will be needed while providing end-end logistics

■ Addis Djibouti

■ Awash Mekele

□ Focus on the next pages

Action	Description	Capex required USD Millions	Details	What	How
BD/ Marketing sales units	Create an internal unit for development of relations and business for freight transport. Marketing and sales initiatives through freight expos	1	- Creation of a separate BD unit within ERC focusing on 4 stakeholders of freight - Track access sales to independent operators	- Local skill development - Direct management of revenue drivers	BD strategy and focus on sales as a priority
3PL logistics	Invest in an in-between logistics transport system for rail head to depot transfers	1	Contracts with freight forwarders and 3PL partners for end-to-end goods transfer	Provide end to end freight logistics for the region	Partnering with local 3PL companies
Link turnouts to key importers/ exporters	Link lines to key importers/exporters e.g. cement and fertilizer	125	- Connect last mile to fertilizer factory and cement - Could be financed through PPP	Reduced freight cost for rail should drive higher volume	Funding can be sourced through private investment
Inland dry ports	Set up inland port at Kombulcha and upgrade of Indode port	150 10 160	Ports to complete customs clearing in the north to allow for direct export transfer	Goods can by-pass Addis and go directly to port	Temporary outsourced to build internal skills
Fleet	Additional fleet to carry expected demand capture	35 160 195	1,800 additional wagons and 65 additional locomotives	Fleet to meet demand	Priority delivery of already purchased fleet
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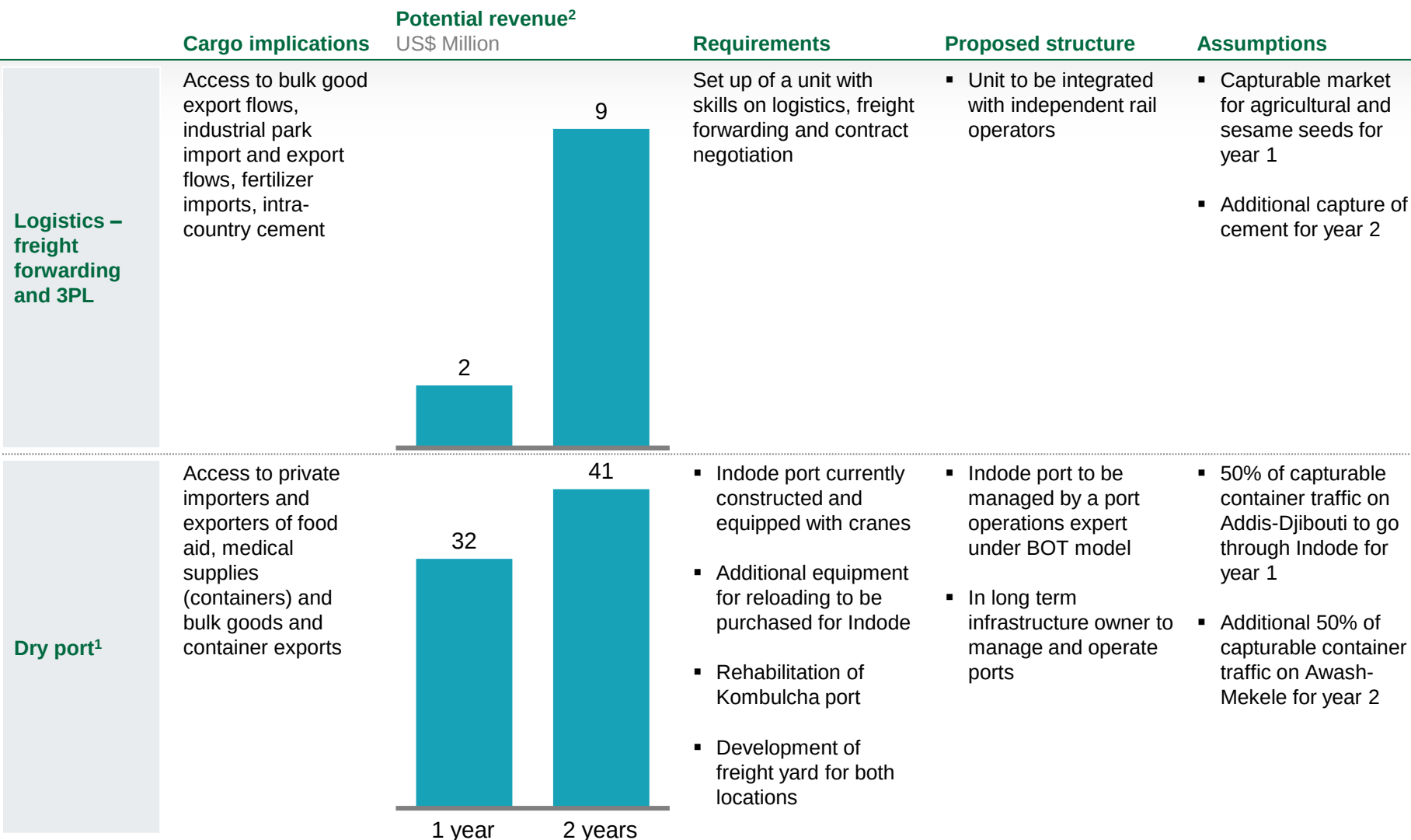
Of the additional services that the rail could provide, 3PL, port services and customs clearing would be the most attractive

Potential service offering  Yes  No  Questionable

Description	Attainability	Attractiveness	Competitive advantage for railway		
Trucking operations	Set up own trucking unit with fleet and staffing to operate 	Low entry barriers (Capex for fleet) 	- Often low EBIT margin (1–2% in EU) - Fragmented market with many competitors	- Direct access to many large customers which require trucking - Skills and cost for initial set up resource heavy - Lack of scale may lead to low utilization 	Not recommended
Logistics (Freight Forwarding and 3PL)	Set up unit to manage partnerships and contracts with 3PL providers 	Low entry barriers (no significant Capex) 	- Attractive EBIT margin (~2–6%) - Stable even in downturn	- Direct access to many large customers which require trucking - Lack of scale may impact competitiveness of pricing 	Recommended through freight operators
Ethiopia dry port	Set up port operations unit to operate Andode dry port including clearing, port operations and cargo terminal operations 	- No established market in the region - Mojo port has limited capacity 	- Depends on cost competitiveness of rail container transport chain vs. road - Can be influenced through infrastructure charges or regulations	- Port skills within the railway organization to be built from scratch - Integrated planning with rail required 	Recommended for ERC with outsourcing
Warehousing	Build and operate warehouses for storage of containers, loading offloading facilities 	Rather low entry barriers (Capex/lease) 	- Generally low EBIT margin (~2–5% in EU) - Very few players extract high margins through radical application of lean method	- No specific warehouse operations know-how - Limited use of warehousing by the railway's freight flows 	Not recommended
Local depot/silo	Build and operate storage silos for agricultural goods close to rail head 	Capex investment and time to build 	Local providers better equipped and have better knowledge	Attractive for export of bulk dry goods if storage needed close to rail head 	Not recommended



Through the optimal logistics partnering solution the line could generate an additional US\$34 million in the first year of operations



¹ Port operations would be under a build-operate-transfer model with experts hired under ERC for initial operations with skills transfer to local staff within one year

² Based on assumption that half the proposed capture of container traffic on imports will come to Indode



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While in theory ERC could consider PPP models to build both new lines and link rails, the latter is more realistic given the financial attractiveness of planned lines

Details to follow

PPP Options	Description	Applicability to ERC	Rationale	Impact for ERC
PPP to develop new lines	- Private player funds construction and operates (for a limited agreed upon period of time) new lines to recover investment and capture additional returns - Several models: Build – Operate - Transfer, Design – Build – Operate – Transfer are most popular with rail		Return on potential lines may not be high enough to attract investors	In order to expand the rail network, the government needs to fund the lines or guarantee high volumes to the concessioner
PPP to capture new demand	- Private player funds construction of infrastructure to their own production facility; recovers investment through cost savings on transportation of goods - Private player or ERC may construct and operate line, depending on preferences of players		- Shifts CapEx investment to private player - Attractive to large producers close to line as the total point-to-point transport cost is reduced	- Small link rails exist that could be developed profitably even with commercial interest rates - Engaging with the main user of the line would also reduce future utilization risk



We identified two potential locations for PPP link rail development; feasibility depends on projected volumes and distance from rail



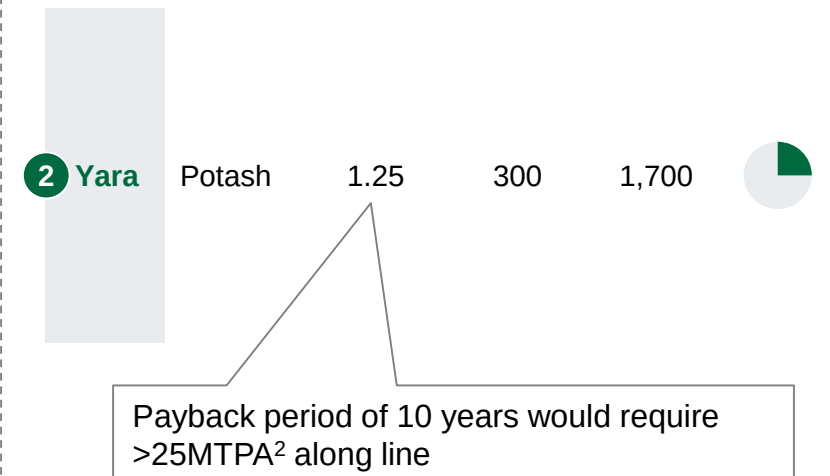
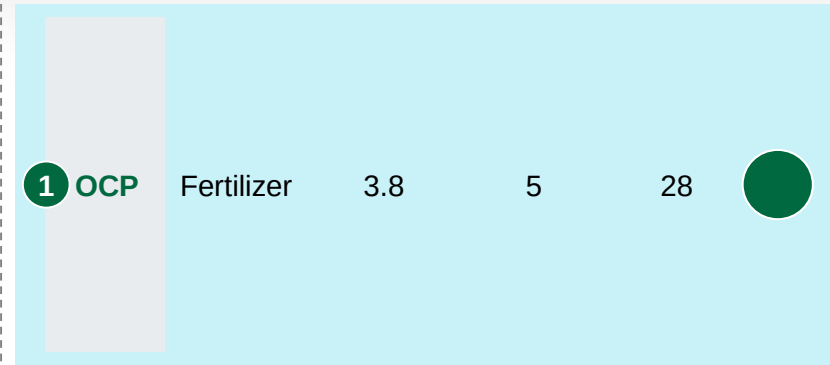
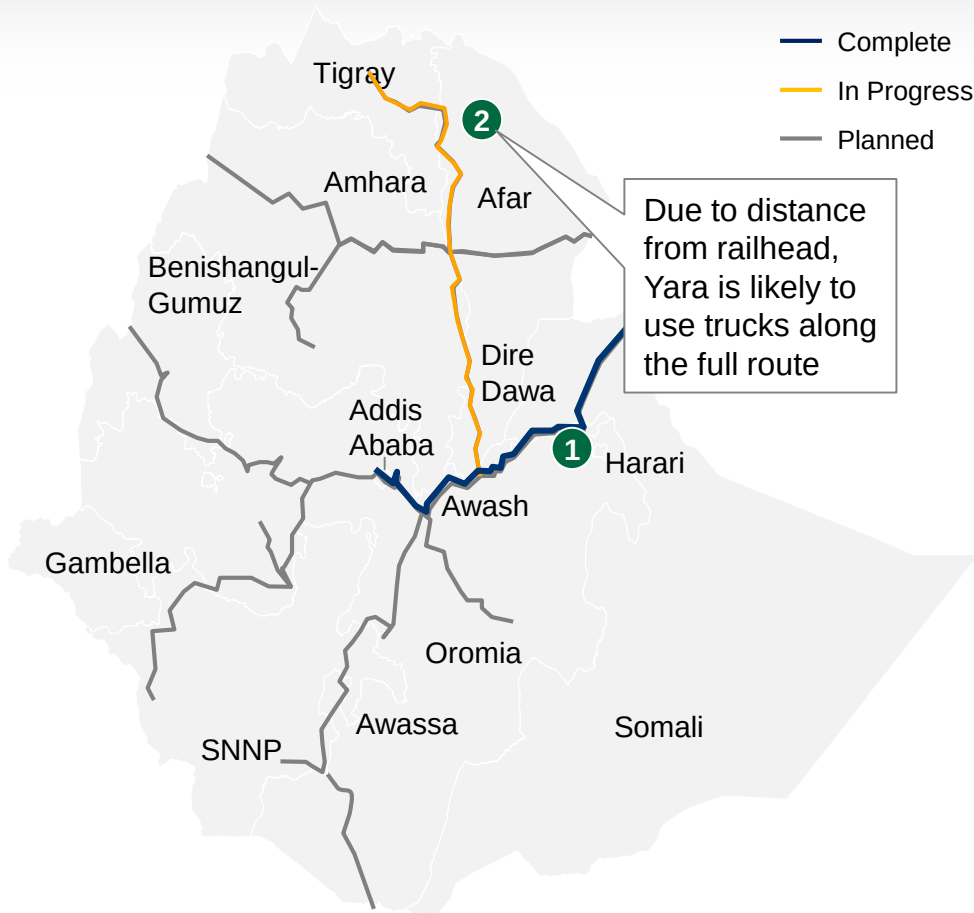
Potential PPP partner



Detail to follow

Railroad

Potential partner	Commodity	Volume (MTPA)	Distance from Rail (Km)	CapEx ¹ (\$M)	Feasibility
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¹ Based on average total capital expenditure per KM for Addis - Djibouti and Awash - Mekele lines

² Based on capex cost/km of ~\$5.6M, fixed opex of ~\$155K/KM, variable opex of ~\$0.02/TKM, and average truck cost of \$0.045/TKM

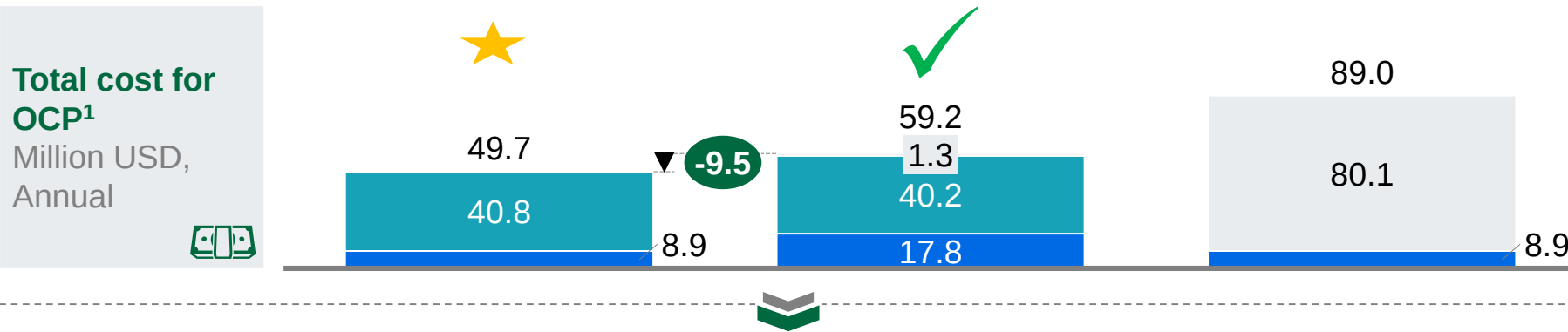
SOURCE: ERC Rail Network Division; SLU; Ministry of Mines; SNL,

Link rail between OCP and Addis – Djibouti line could offer annual savings of \$10M to OCP; ERC can capture part through PPP

★ Optimal OCP Decision²
✓ Current OCP Decision³
Road Cost
Rail Cost
Loading Cost

Option 1 – Rail (With Link) Option 2– MultiModal Option 3 – Road

Description	Option 1 – Rail (With Link)	Option 2– MultiModal	Option 3 – Road
	OCP funds link rail (\$28M) to Addis – Djibouti line from Dire Dawa factory	OCP uses trucks to transport fertilizer from factory to main line, then loads onto rail	OCP transports fertilizer by truck for full distance

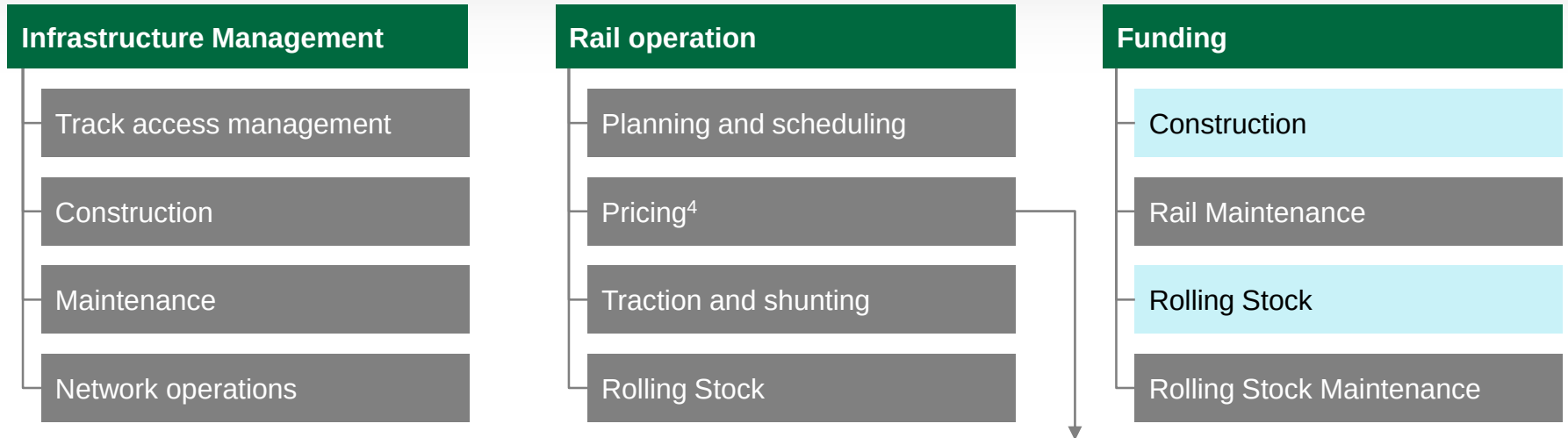


- Without a link rail, **OCP would still utilize rail on the main line due to the high cost of trucking** from Dire Dawa. Comparison of USD/km prices below – Truck: 0.1 – Rail: 0.045
- OCP can reduce annual transportations costs by ~10M USD per year** with a link rail
- ERC can generate revenue by acting as the constructor and operator on the link rail while OCP funds CapEx

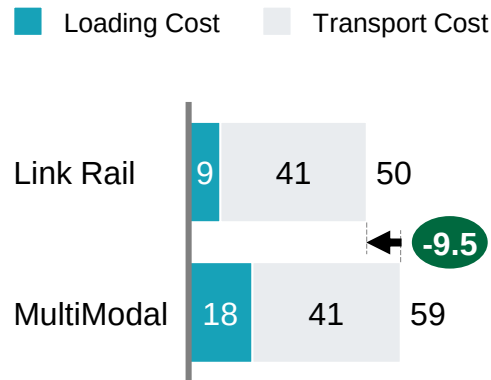
¹ Assuming 2.8MTPA, 5km link road, 0.049USD/TKM rail price, and 90birr point-to-point truck cost, and equal volume to Mojo and Djibouti;
² OCP decision if link rail is available;
³ OCP decision under current conditions

ERC/EDR could manage construction and operations, while OCP would provide CapEx funding. Pricing should benefit both parties

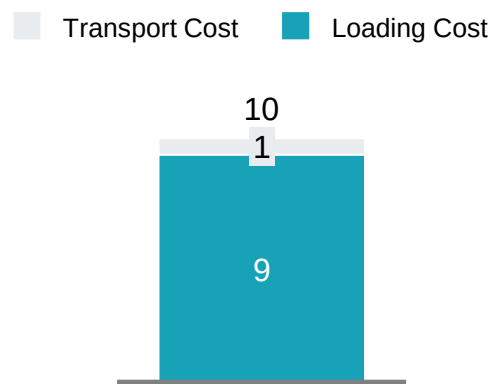
■ OCP ■ ERC/EDR



OCP Transport Costs² (USD Millions, Annual)



OCP Savings with Link Rail (USD Millions, Annual)



To maximize revenues, ERC must capture savings from reducing handling costs

- **>90% of OCP savings are driven by elimination of double handling**
- If ERC charges average price¹, it will lose \$400K annually on the link as a result of fixed operating costs³
- If ERC charges a **flat rate of 19.9 - 21.2² USD/ton, they can profit ~\$10 - 18M annually**
- In either case, based on 2.5-3.8MTPA, **OCP will breakeven <5 years⁵**

1 0.049 USD/TKM 2 Selected as highest price while keeping OCP breakeven below five years 2 Assuming 2.5M tons annually, 0.05 birr/kg loading cost, 0.049 usd/tkm rail cost. \$19.9 assuming 2.5MTPA, 21.2 assuming 3.8MTPA 3 Operating costs which remain fixed regardless of volume (e.g., portions of labor, energy, etc.) 4 Set by EDR/ERC through negotiations with OCP 5 Assuming discount rate of 11.5% and return of 20% on top of investment



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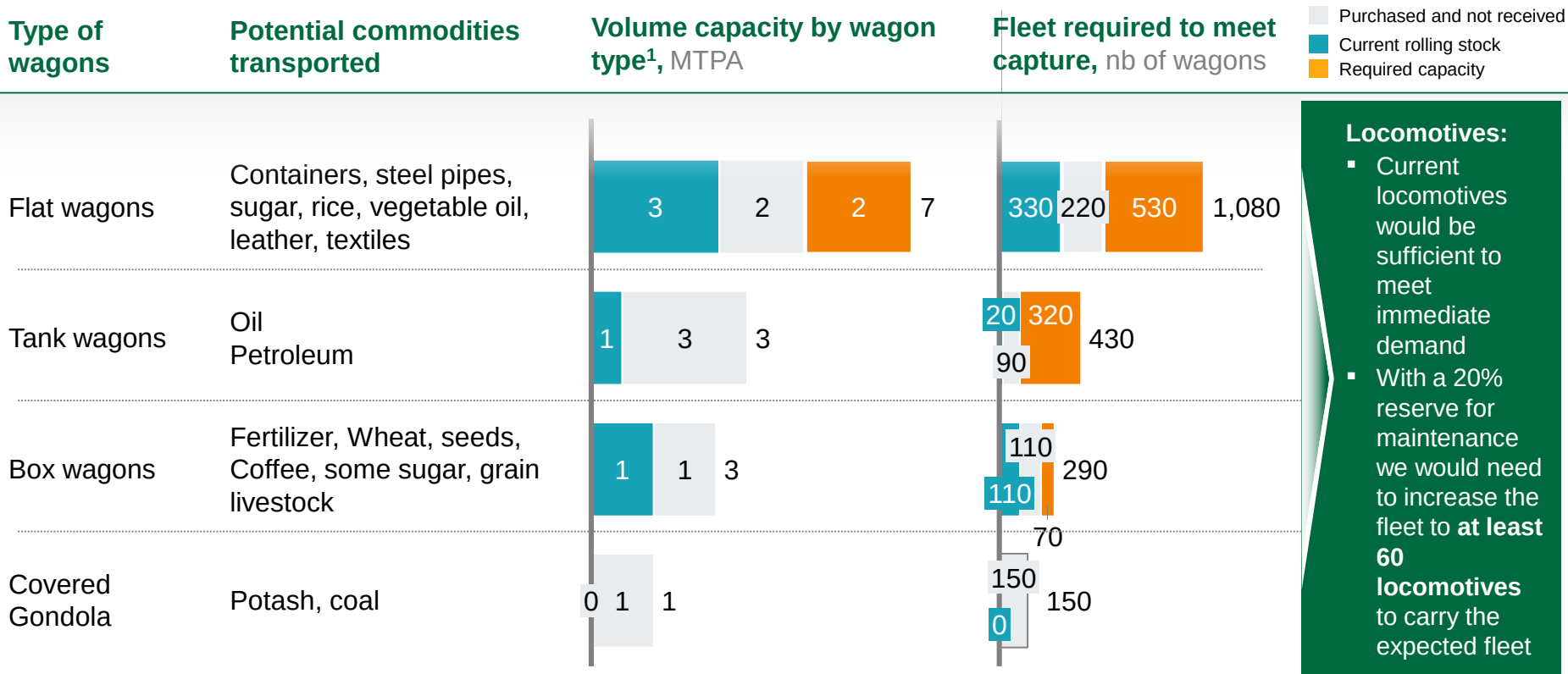
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An investment in 620² additional wagons and at least 60 additional locomotives to capture the predicted flows is needed



- With an assumed turnaround time of 3 days per train actual fleet capacity would be 14MTPA
- We would need to ensure the full fleet as acquired for flat wagons and tanks is delivered and operational, the bulk of equipment purchased yet not received is still in China awaiting payment
- We would need to increase fleet capacity by 620 wagons to meet expected demand capture for containers and oil
- The rolling stock maintenance depot would need to be expanded to meet the increased fleet size

¹ Assume 1 full train per day for 350 days per year, each wagon carrying 70 Tons

² Assumes 20% reserve for maintenance

SOURCE: ERC Rolling stock report

The realization of rail potential in Ethiopia relies on line capacity optimization, and maximal demand capture, and is enabled by systematic capability building, a healthy balance sheet and supportive regulation and sector governance

Detailed next

Pillars



Line capacity optimization



- Line-wide capacity investment in infrastructure - An investment of US\$ 92 Million is needed to achieve the medium term capacity gain of 15MTPA on the line

Maximal demand capture



- To capture demand, investment in sales and marketing, depots and links to the fertilizer factory will be needed while providing end-end logistics
- Strategic sales and marketing** : Develop sales and strategic marketing activities to capture the natural market for rail
 - Being allowed to price at bulk at "bulk switch prices" for target goods and sources – a 75% drop vs today's price in main commodities and further 35% drop in up export grade" commodities
 - Being allowed to propose to traffic sources a full logistics service pick up from plant, with trucking a sub-supplier and road as a traffic feeder to rail heads;
- Client or rail-head specific investment** in private sidings, last mile to port and handling facilities
- Additional fleet** to meet customer demand

Enablers



Capability building



- Build the capabilities required to support the ramp up plan
 - Develop key professions currently missing (sales and marketing – including pricing; station management, depot management; network operations; real estate) while reinforcing existing functions (financing and strategic investment; operations; contract management)
 - Develop leadership capabilities missing skills within existing staff for the new organization and operational skills to be transferred from the management contractor
 - Create the required HR systems (performance management systems, supporting tools and systems)

Stabilized balance sheet



- The government to carry out the existing debt on its balance sheet in order to allow ERC to invest in the profitable investment required to reach the potential of existing lines

Sector governance and Regulations



- Sector governance** : the Ethiopian government should revise the current sector governance structure as it presents multiple critical challenges
 - Incentives aren't put in place to maximize the sector value creation (e.g. operator also managing the infrastructure)
 - Duplicated resources as ERC and EDR are both expected to manage different parts of the infrastructure
- Regulations** – the Ethiopia government could further support the development of the sector through
 - Regulations to support the attractiveness of rail (including authorizing strategic pricing for rail)
 - Land development around passenger stations through PPP or concession models

There are two areas of focus for capability building



1

Create and develop the key functions and skills that are missing from the existing organisation that are core for a profitable rail organisation.

- Create functions required for rail organisations to operate profitably e.g. Sales and marketing, TOD, station management
- Develop strong leaders through leadership capability building
- **Change the current skills transfer model to a strong, performance based build-operate-transfer model for technical and operational skills development**



2

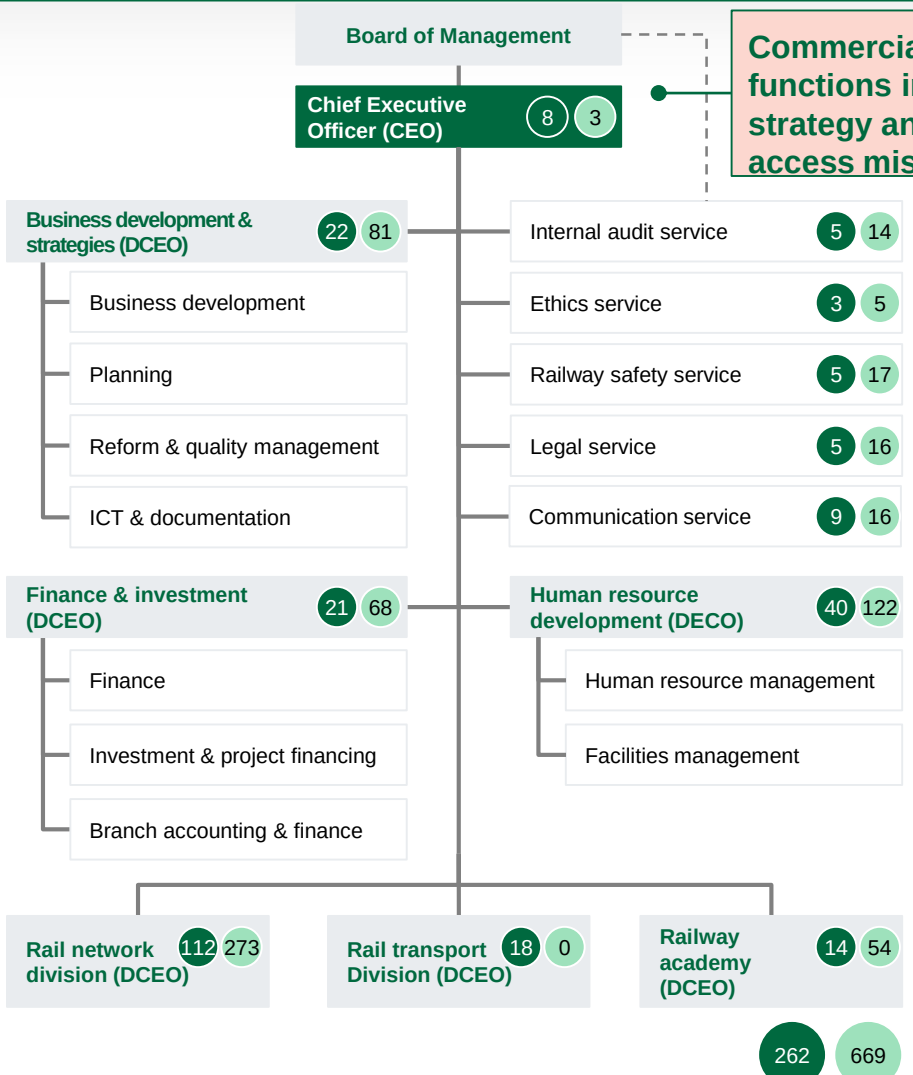
- **Address key issues** highlighted through interviews and staff surveys that impact the day-to-day ease of operations of the organisation (Systems and processes, performance management and tools)

The current organisational structures of both ERC and EDR are missing core functions essential to rail

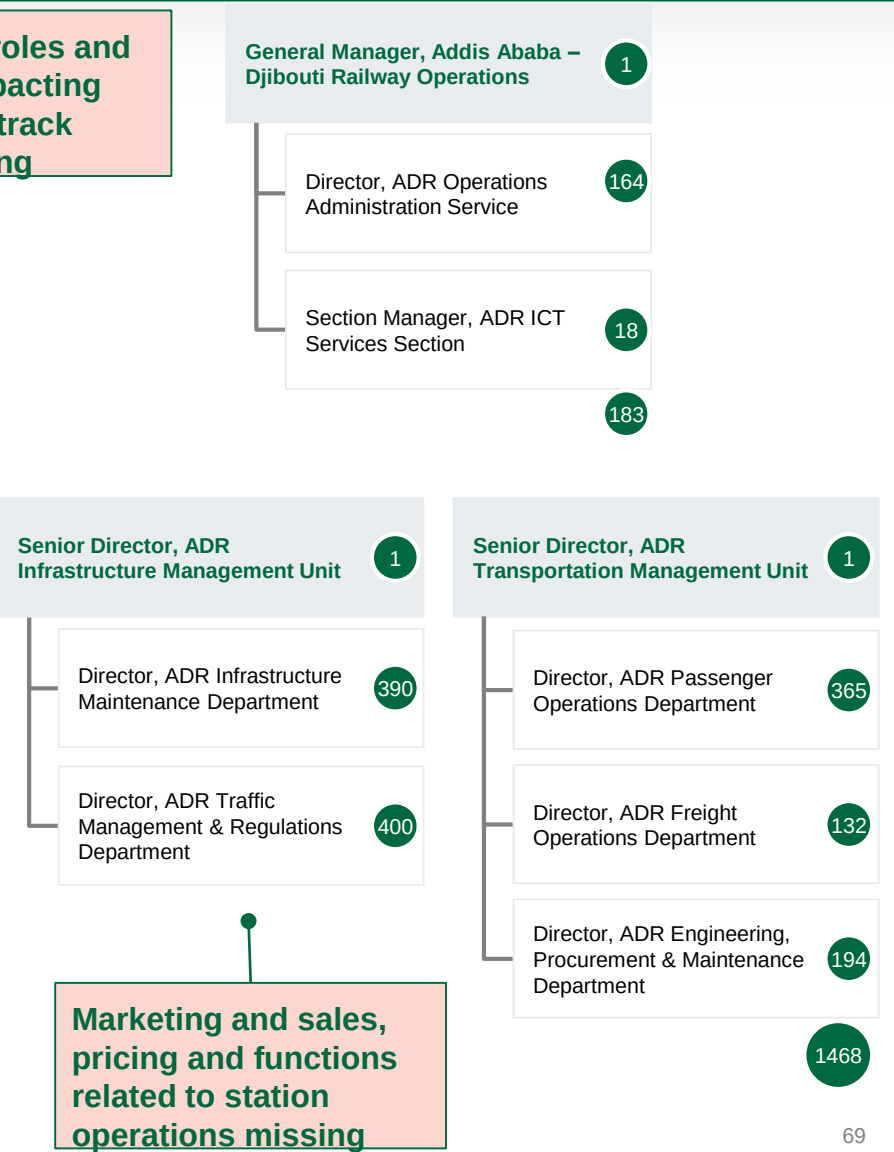


● Staffed
 ● Vacant

Current ERC organisation



Current EDR organisation¹



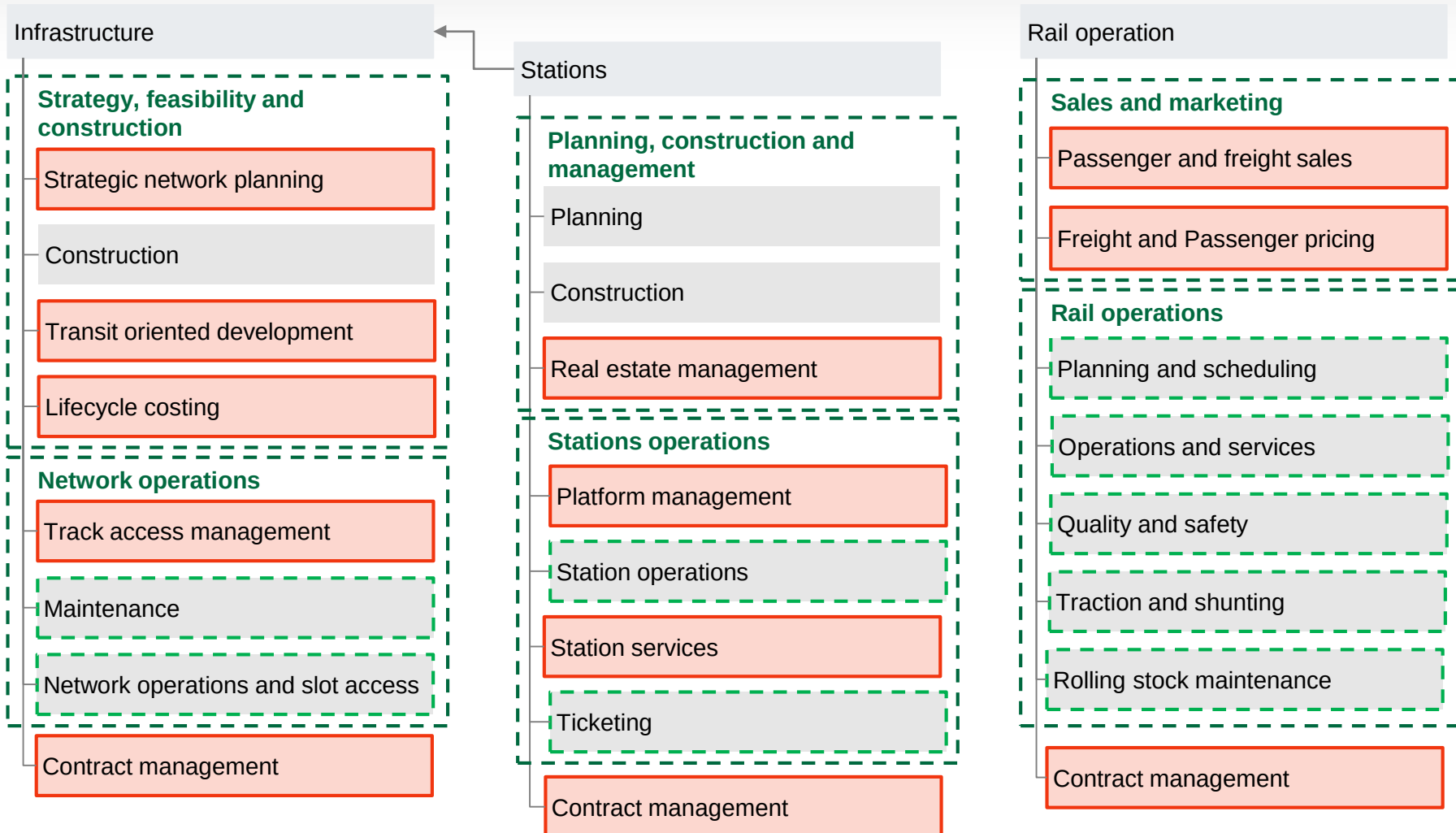
¹ Based on planned structure. Effective organisational structure and staffing are not available

There are key skills missing within ERC and EDR in the core functions of the rail organisation



Function is not in place

Function outsourced to management contractor



The build-up of key operational functions and skills within the organisation could be done in two ways

Description

Functions impacted

A

Training and internal skills development

- Functions related to strategy, soft skills, key business skills and commercial profitability
- These units would need to be created within the organisation and skilled staff hired or upskilled to fill these roles
- Upskilling would be done through training by expert organisations in these specific functional areas

- Key strategic functions such as transit-oriented development, strategic planning, life cycle costing
- Business development, sales and marketing and pricing
- Real estate management for stations and other assets
- Critically contract management and management of commercial operations

B

Build-operate-transfer model

- Operational skills that rely on experts with hours of operational experience require a build-operate-transfer model for skills development
- The management contractor or outsourced expert would have a skills transfer obligation within their contract through which local staff are matched to role and function with the contractor
- Training and skills transfer occurs through job shadowing, gradual transfer of operations and technical training by role and function
- This is ideally a KPI on performance management of the outsourced contractor

- Skills and functions related in the day to day operations and maintenance of the network and fleet
- Network infrastructure maintenance
- Fleet operations – train operators, signaling, OCC staff
- Station operations – station master, platform management, ticketing
- Rolling stock maintenance



A

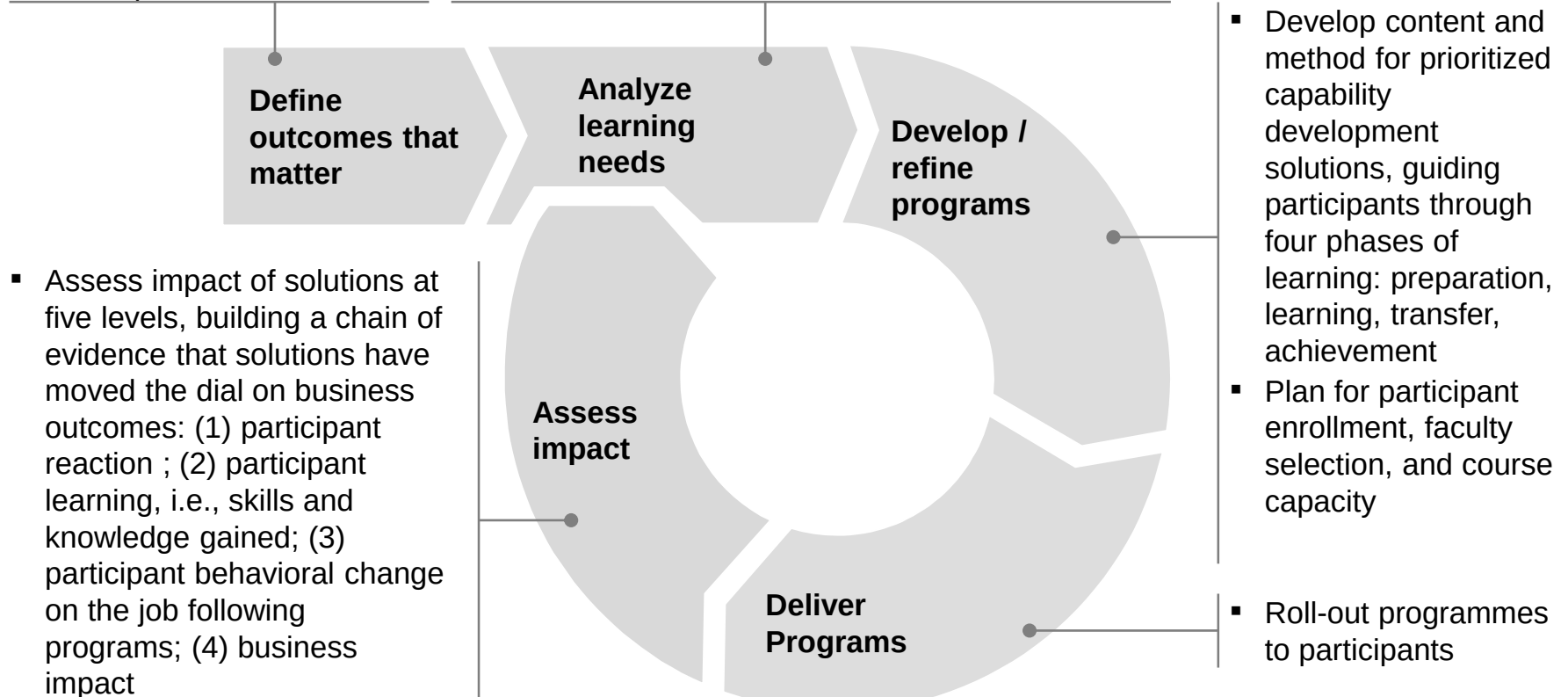
Some skills need to be newly developed while others would require strengthening within the organisations

Skills to be developed internally

Skill need identified	Key capability required	KPI	Best practices
New professions	Freight and passenger sales	- Sales and marketing - Transport logistics - Pricing strategy	% increase in revenue % increase in no. of customers - Dynamic pricing policy reviewed bi-annually
	Station operations and management	- Real estate management - Operations management - Customer service	% increase in per sq. m revenues through alternate avenues - Station revenues to contribute >50% of total revenue
	Depot operations and management	- Logistics management - Port operations - Customs and clearing	- No. of containers/ tons cleared per annum - Fast turnaround for loading and unloading - Train turnaround time less than 3 days
	Network operation	- Train scheduling and access planning - Infrastructure maintenance - Asset management	- No. of additional operators - Days of operation of lines 90% track availability
	TOD	- Partnership development - Negotiation - Contract management - Land valuation	- TOD revenue - NA
Improvement on Existing ones	Financing	- Financial statement creation & projection - Sensitivity / scenario analysis	% of portfolio which is operationally profitable - Hedging against ForEx Losses
	Strategic investment	- Research and data collection - Financial analysis and modeling - Stakeholder management	% of portfolio with positive ROI - Average line profitability - Assessment – consolidation – selection approach to prioritization
	Contract management	- Project and task management - Procurement and contract administration - Negotiations	- Cost and time contract overruns % of on time and on budget contracts - Dedicated CMO¹ - Equal data access for owner/supplied - Input and output KPIs
General	Leadership development	- Leadership skills - People, performance management and problem solving skills	- Employee performance review - Leaders identified by skill and functions - Each function to have single leaders

¹ Following objective/skill assessment additional training needs and skills may be identified

▪ Determine business-level outcomes desired by ERC i.e. the business sponsors of the capability development solutions	▪ Define what required performance looks like ▪ Assess current performance to determine need for capability development solutions ▪ Define a set of priority capability development solutions with clear learning objectives ▪ Develop initial ideas on learning environment needs of difference audiences
---	---



For the first stage of capability building focus would be on leadership development at two levels



Program type

Description

Top-team capability building program

- | | | |
|-----|---|--|
| 1.1 | Introduce the 6Ps ¹ : Discover the 6Ps of leadership | <ul style="list-style-type: none"> Introducing the 6Ps of leadership Reflecting on existing cultural strengths Understanding what new behaviors would be required |
| 1.2 | Set direction: Sharpen the personal vision for what we want leaders to achieve | <ul style="list-style-type: none"> Determining the vision Communicating the purpose through a change story Aligning as a team |
| 1.3 | Growing the people at ERC: Understand how to strengthen your team | <ul style="list-style-type: none"> Exploring how to build trust Empowering people to help them develop as leaders Understanding leader roles in creating a culture of engagement |
| 1.4 | Drive performance: Focus on realizing performance improvements | <ul style="list-style-type: none"> Cultivating a more productive problem solving culture Having collaborative conversations about performance that lead to better results |
| 1.5 | Sustain the gain: Reflect on what has been achieved and plan for the path forward | <ul style="list-style-type: none"> Stepping-back to reflect on what leaders have achieved and remaining challenges Developing a plan for how to take action to advance the management transformation |

Mid-level management capability building program

- | | | |
|-----|---|--|
| 2.0 | Example capability building program | <ul style="list-style-type: none"> Overview of how capability building program could be sequenced to deliver skills |
| 2.1 | Build the case change in the organization: Preparing for change | <ul style="list-style-type: none"> Establishing the personal vision Aligning on a collective vision |
| 2.2 | Share and collaborate across teams: Facilitating performance dialogs | <ul style="list-style-type: none"> Understanding the importance of mindsets in performance dialogs Discussing what good performance dialogs look and feel like Practicing a performance dialog with real-time feedback |
| 2.3 | Become a problem solving leader: Problem solving leadership | <ul style="list-style-type: none"> Defining the role as a problem solving leader Talking about problems productively Reflecting on how to create an effective problem solving culture Practicing problem solving leadership skills |
| 2.4 | Convert performance improvements into results: Accountability and ownership | <ul style="list-style-type: none"> Reflecting on own behavior Shifting personal mindsets to accountability and ownership Creating a culture of accountability and ownership |
| 2.5 | Set the stage for continuous improvement: Reflect on progress and plan for future | <ul style="list-style-type: none"> Prioritizing remaining challenges Developing a plan to build on strengths and tackle remaining challenges |

¹ Leadership 6P's: Process, problem solving, performance, partnering, purpose and people



B Technical and operations skills would be transferred by experts through skills transfer

Skills to be developed internally

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New professions	Freight and passenger sales	- Sales and marketing - Transport logistics - Pricing strategy	% increase in revenue % increase in no. of customers - Dynamic pricing policy reviewed bi-annually
	Station operations and management	- Real estate management - Operations management - Customer service	% increase in per sq. m revenues through alternate avenues - Station revenues to contribute >50% of total revenue
	Depot operations and management	- Logistics management - Port operations - Customs and clearing	- No. of containers/ tons cleared per annum - Fast turnaround for loading and unloading - Train turnaround time less than 3 days
	Network operation	- Train scheduling and access planning - Infrastructure maintenance - Asset management	- No. of additional operators - Days of operation of lines 90% track availability
	TOD	- Partnership development - Negotiation - Contract management - Land valuation	- TOD revenue - NA
Improvement on Existing ones	Financing	- Financial statement creation & projection - Sensitivity / scenario analysis	% of portfolio which is operationally profitable - Hedging against ForEx Losses
	Strategic investment	- Research and data collection - Financial analysis and modeling - Stakeholder management	% of portfolio with positive ROI - Average line profitability - Assessment – consolidation – selection approach to prioritization
	Contract management	- Project and task management - Procurement and contract administration - Negotiations	- Cost and time contract overruns % of on time and on budget contracts - Dedicated CMO¹ - Equal data access for owner/supplied - Input and output KPIs
General	Leadership development	- Leadership skills - People, performance management and problem solving skills	- Employee performance review - Leaders identified by skill and functions - Each function to have single leaders

¹ Following objective/skill assessment additional training needs and skills may be identified

For general operational skill transfer BOT contracts it would take one – three years depending on complexity of the role



Skills transfer model		Operations: Network and rail operated by outsourced contractor with one-to-one job shadowing and skills transfer		Operations all managed by local staff
Stages	Today: Contract review, role and transfer requirements, measurement matrix			
Activities	▪ Definition of roles and organisation structure for operations ▪ Detailed functional review – contractor to provide core skills, job description and details of role for each stage of operations ▪ Negotiation and contracting – Contract clauses to include contractor to hire local staff for contract period – Skills transfer matrix including timeframe, assessment, verifications ▪ Staff assessments on current skills – Review of current staffing – Assessment of skills	▪ Job-shadowing – Matching of staff to roles – Operations of equipment transferred from 100-0 outsourced to 50-50 outsourced-local ▪ Continuous assessment and improvement in case of: – Performance/ quality/ not meeting the agreed SLAs – Ramp up not occurring at desired speed		▪ Outsourced supervision – Local staff to run all operations – Contractor to provide weekly assessments on operations through supervision and assessments – Critical failure areas to be prioritized for upskilling
Timeline	← 3 months → ← 12-36 months → ← 6-12 months →			



1

Create and develop the key functions and skills that are missing from the existing organisation that are core for a profitable rail organisation.

- Create functions required for rail organisations to operate profitably e.g. Sales and marketing, TOD, station management
- Develop strong leaders through leadership capability building
- **Change the current skills transfer model to a strong, performance based build-operate-transfer model for technical and operational skills development**



2

- **Address key issues** highlighted through interviews and staff surveys that impact the day-to-day ease of operations of the organisation (Systems and processes, performance management and tools)

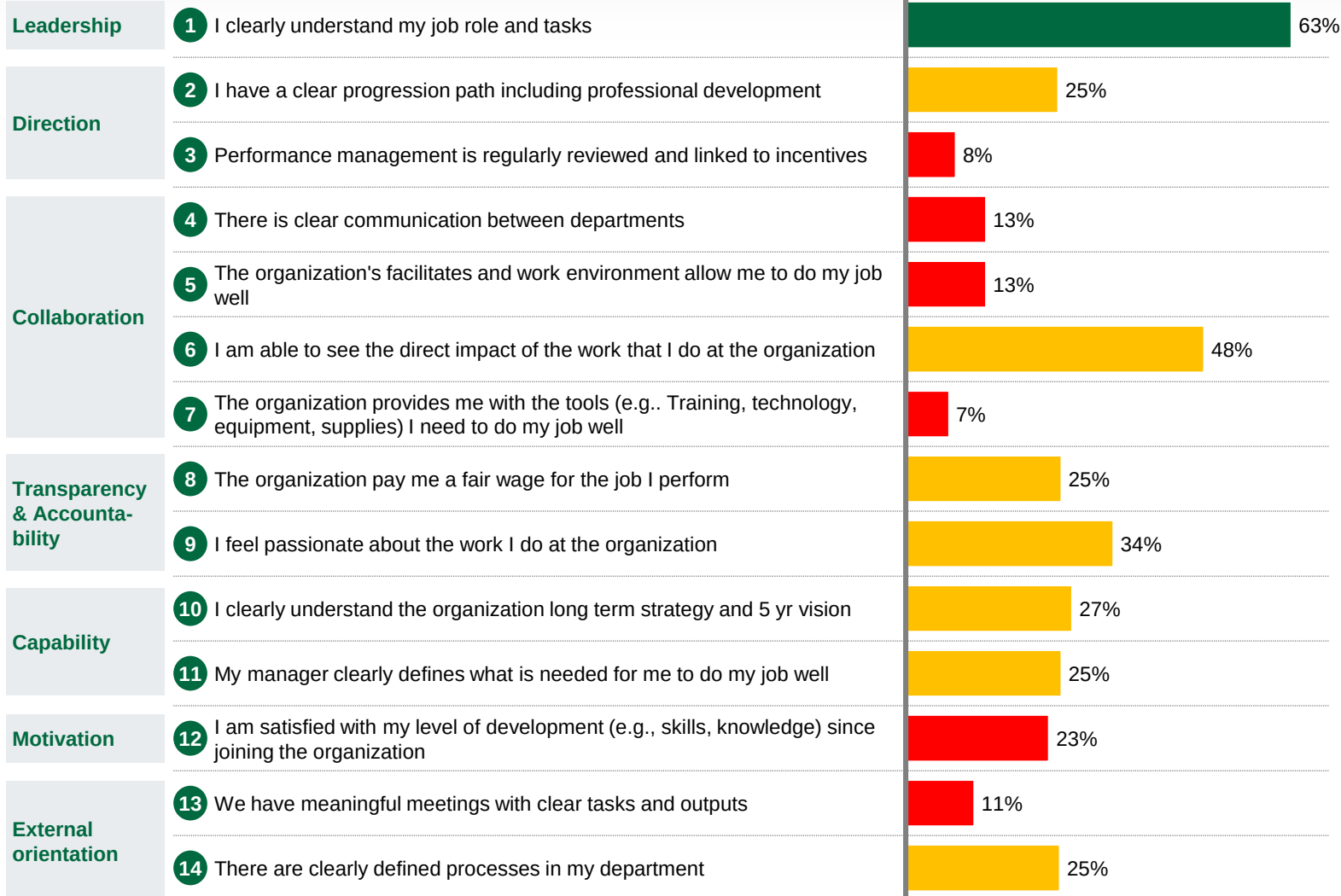
Barometer survey shows staff understand their role but want improved performance management and role specific training



Questions

Responses

● <25% Agree ● 25%-50% agree ● >50% agree



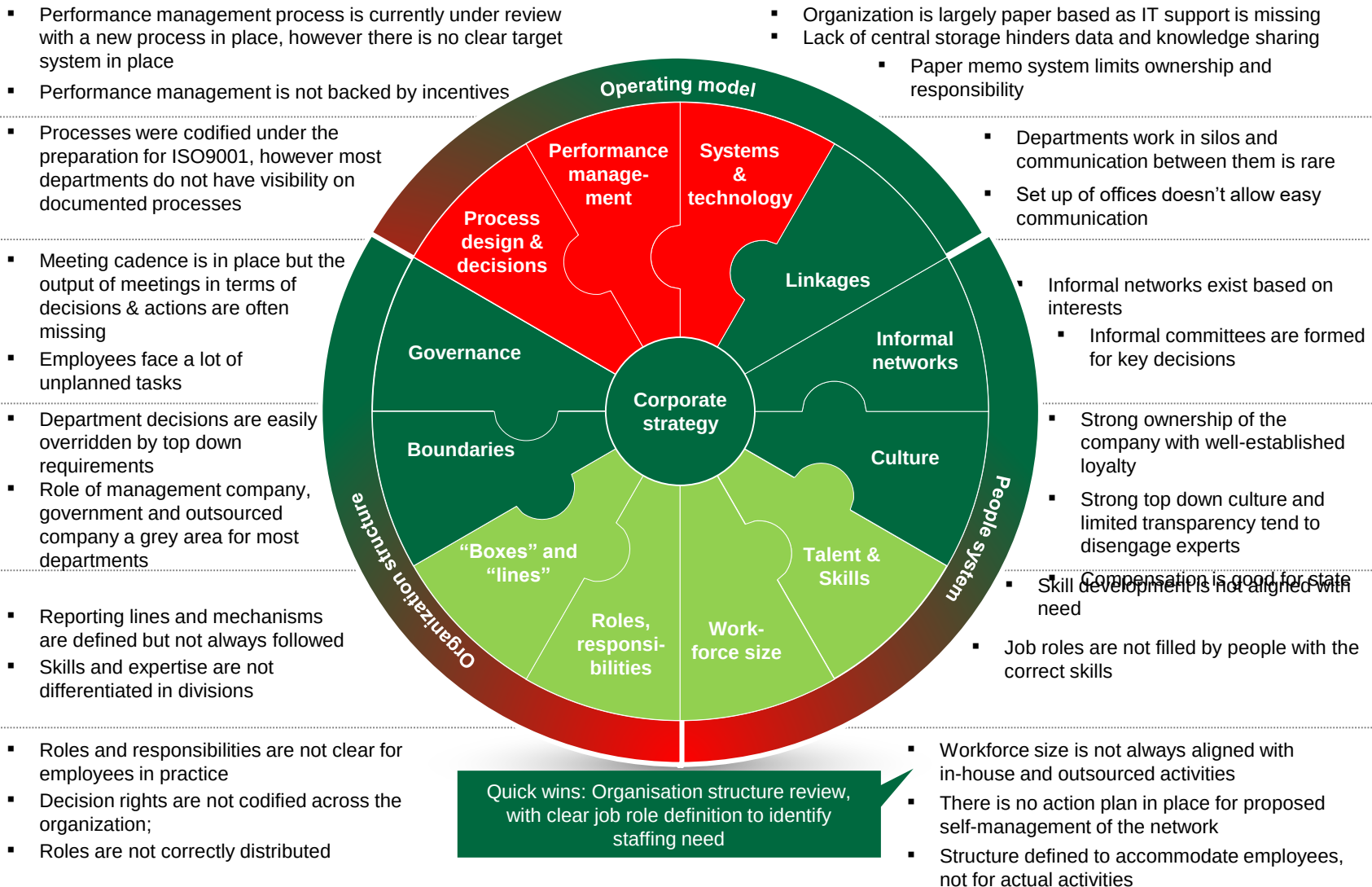
Key insights

- Staff have a clear understanding on what they are supposed to do, however this is due to day-day momentum instead of leadership guidance
- Most staff do not feel their development needs are being met
- Performance management has not been systematic
- Interdepartmental communication is not effective or productive and meetings are often redundant
- Staff are committed to ERC and have a sense of ownership of the company, but are not clear on the long term vision

We have identified three core areas for improvement, process design and decisions, performance management and systems.



Significant challenges Generally positive Governance and Strategy initiatives



The realization of rail potential in Ethiopia relies on line capacity optimization, and maximal demand capture, and is enabled by systematic capability building, a healthy balance sheet and supportive regulation and sector governance

Pillars



Line capacity optimization



- Line-wide capacity investment in infrastructure - An investment of US\$ 92 Million is needed to achieve the medium term capacity gain of 15MTPA on the line

Maximal demand capture



- To capture demand, investment in sales and marketing, depots and links to the fertilizer factory will be needed while providing end-end logistics
 - Strategic sales and marketing** : Develop sales and strategic marketing activities to capture the natural market for rail
 - Being allowed to price at bulk at "bulk switch prices" for target goods and sources – a 75% drop vs today's price in main commodities and further 35% drop in up export grade" commodities
 - Being allowed to propose to traffic sources a full logistics service pick up from plant, with trucking a sub-supplier and road as a traffic feeder to rail heads;
 - Client or rail-head specific investment** in private sidings, last mile to port and handling facilities
 - Additional fleet** to meet customer demand

Capability building



- Build the capabilities required to support the ramp up plan
 - Develop key professions currently missing (sales and marketing – including pricing; station management, depot management; network operations; real estate) while reinforcing existing functions (financing and strategic investment; operations; contract management)
 - Develop leadership capabilities missing skills within existing staff for the new organization and operational skills to be transferred from the management contractor
 - Create the required HR systems (performance management systems, supporting tools and systems)

Stabilized balance sheet



- The government to carry out the existing debt on its balance sheet in order to allow ERC to invest in the profitable investment required to reach the potential of existing lines

Enablers



Sector governance and Regulations



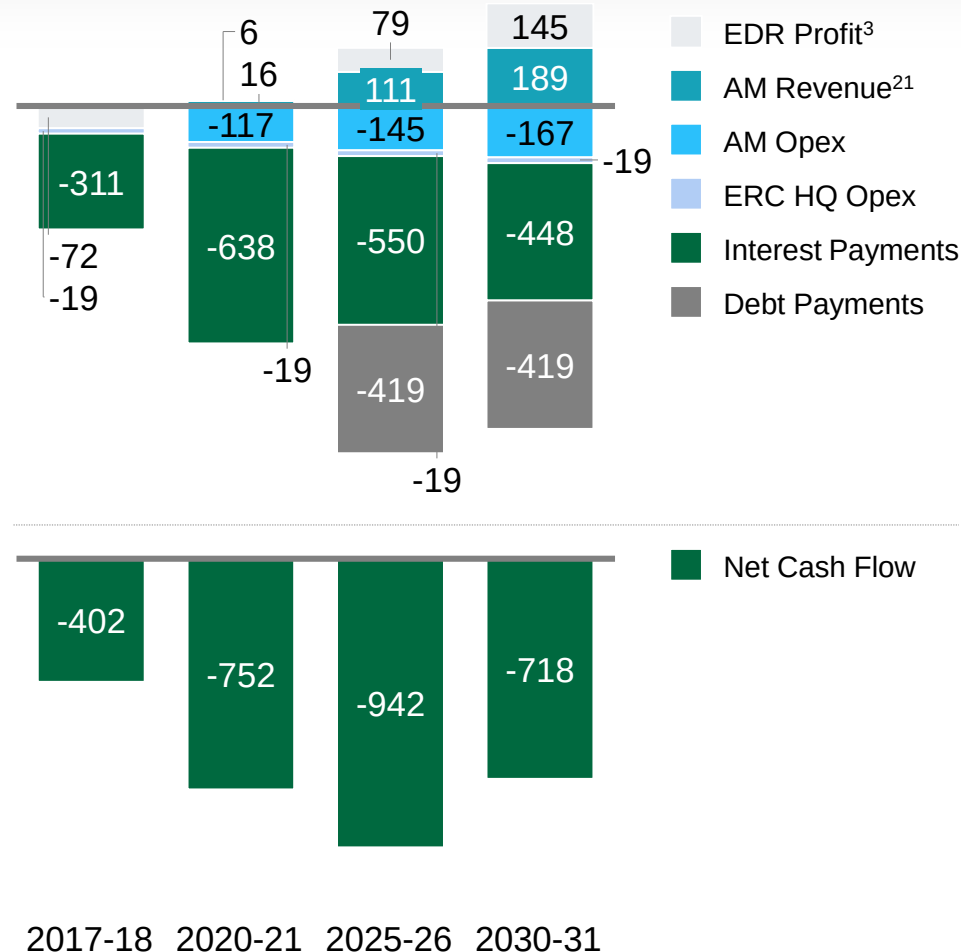
- Sector governance** : the Ethiopian government should revise the current sector governance structure as it presents multiple critical challenges
 - Incentives aren't put in place to maximize the sector value creation (e.g. operator also managing the infrastructure)
 - Duplicated resources as ERC and EDR are both expected to manage different parts of the infrastructure
- Regulations** – the Ethiopia government could further support the development of the sector through
 - Regulations to support the attractiveness of rail (including authorizing strategic pricing for rail)
 - Land development around passenger stations through PPP or concession models

In the next decade ERC will be unable to pay off their debt or even their interest burden

ERC Cash Flow with base case growth assumptions, USD M

Key assumptions

EDR profit allocated to ERC will be 75% of the total profit/loss based on 75% ownership stake
Debt payments assume 5yr grace period and payments afterwards are 1/20 of total infrastructure debt including both lines and any new investments
ERC HQ opex comes from consolidated financials opex
Interest and debt includes new investments and new repayment terms (5yr grace + 20yr payback)



- ERC is **unable to pay their debt or their interest payments** in the next ten years, as a result Govt. should consider taking on the debt
- ERC is **less equipped to handle FX risks and refinancing** debt than the government is

¹ Revenue for Awash-Mekele includes contribution to Addis-Djibouti volumes

² AM : Awash-Mekele

³ Ethiopia's portion of EDR's profit (75%)

Government should consider carrying ERC's debt so that ERC is better able to seek financing for smaller profitable investments



ERC carries debt burden

Advantages

- ERC is responsible for their **own debt and aligns incentives** as an SOE
- Debt staying close to the investment puts **accountability and transparency on economic performance** of investment

Dis-advantages

- If ERC has debt on their own books, they will be **unable to finance any other smaller investments** because of large debt burden
- ERC should only **carry FX risk if they earn revenue in FX**, and since they price in ETB, the FX risk burden is better placed with Ministry of Finance
- ERC can finance profitable smaller investments, e.g., new links or signaling, without carrying huge debt burden



Government carries debt burden

- Government is **better positioned to refinance debt to local currency** and to manage foreign currency risk
- Effectively, **government owns the debt anyway** due to their ownership stake of ERC; e.g., government conducted last round of refinancing negotiations
- Government can **hold ERC accountable** to certain **revenue projections or other KPIs**

Identifying and executing profitable investments is a key role of ERC



There are profitable investments opportunities for existing rail to capture more profits



- Capacity
 - Sidings and signaling
 - Fencing and security



- Demand capture
 - Links to producers
 - Fleet

ERC's main business function as of now is executing the best investments for rail in Ethiopia



- Identifying and executing profitable investments



- Managing rail network and operations
 - Possible future role, but currently handled by management contractor

If debt remains on ERC books, ERC will be unable to fulfill its main business function to identify and execute on profitable investments and optimize current line operations and profit.

The realization of rail potential in Ethiopia relies on line capacity optimization, and maximal demand capture, and is enabled by systematic capability building, a healthy balance sheet and supportive regulation and sector governance

Detailed next

Pillars	Line capacity optimization	Line-wide capacity investment in infrastructure - An investment of US\$ 92 Million is needed to achieve the medium term capacity gain of 15MTPA on the line
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Enablers	Capability building	- Build the capabilities required to support the ramp up plan - Develop key professions currently missing (sales and marketing – including pricing; station management, depot management; network operations; real estate) while reinforcing existing functions (financing and strategic investment; operations; contract management) - Develop leadership capabilities missing skills within existing staff for the new organization and operational skills to be transferred from the management contractor - Create the required HR systems (performance management systems, supporting tools and systems)
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The Ethiopian government can plan an active role in supporting the development of the rail sector

■ Focus of the next pages



1

- **Sector governance** : the Ethiopian government should revise the current sector governance structure as it present multiple critical challenges
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2

Regulations -

- **Regulations** – the Ethiopia government could further support the development of the sector through
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Rail development example - SNCF – the French rail network has undergone several restructuring steps to reach its current organization (1/2)

Evolution of SNCF



State owned Private investors

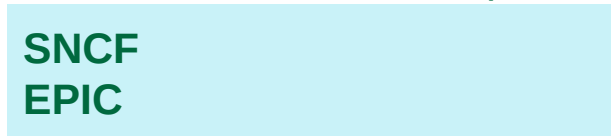
1938 – Consolidation of regional lines to one integrated company



Multiple independent regional railways



1983 – Creation of EPIC, all assets transferred to public limited company



- Public limited company
- All assets transferred

1997 – SNCF EPIC split to RFF and SNCF



- Infrastructure transferred to new company
- Manages and operates network

- Debt transferred to RFF
- Dual payments – Access fee to RFF and management fee to SNCF
- Communication gaps e.g. purchase of too wide trains

Rail development example - SNCF – the French rail network has undergone several restructuring steps to reach its current organization (2/2)

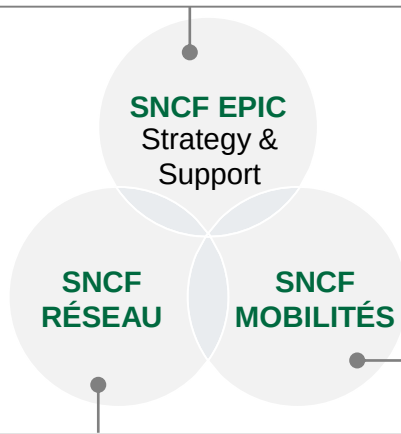


Current structure of SNCF as of January 2015

2014 – Unification of SNCF and RFF to single state owned company under 3 EPIC's

SNCF Immobilier (Property)

- Manages SNCF's property portfolio
- Monetizes assets owned by SNCF Réseau and SNCF Mobilités that are no longer needed for operations, generating additional revenue for the Group



SNCF Réseau (Network)

- Provides to France's rail network infrastructure, including allocating capacity and establishing infrastructure
- Manages network traffic
- Maintains and renovates infrastructure
- Expands and develops the rail network, with a focus on overall efficiency and optimum value

SNCF Voyageurs (Passengers)

- Transilien: commuter transport in the Paris Region
- TER and Intercités: regional trains and classic city-to-city service
- Voyages SNCF: high-speed trains, long-distance coaches in France and Europe, ticket sales
- Gares & Connexions: station management and development¹

Keolis

- Delivers public transport to passengers in France and worldwide
- Operates and maintains all modes of transport and provides related services

SNCF Logistics

- Geodis: freight transport and logistics in France and 120 countries worldwide
- TFMM: rail and multimodal freight transport
- Ermewa: equipment management
- STVA: automobile/vehicle logistics

- There are clear divisions between rail operations and infrastructure
- Internal communication processes have been redefined
- The state owns the entirety

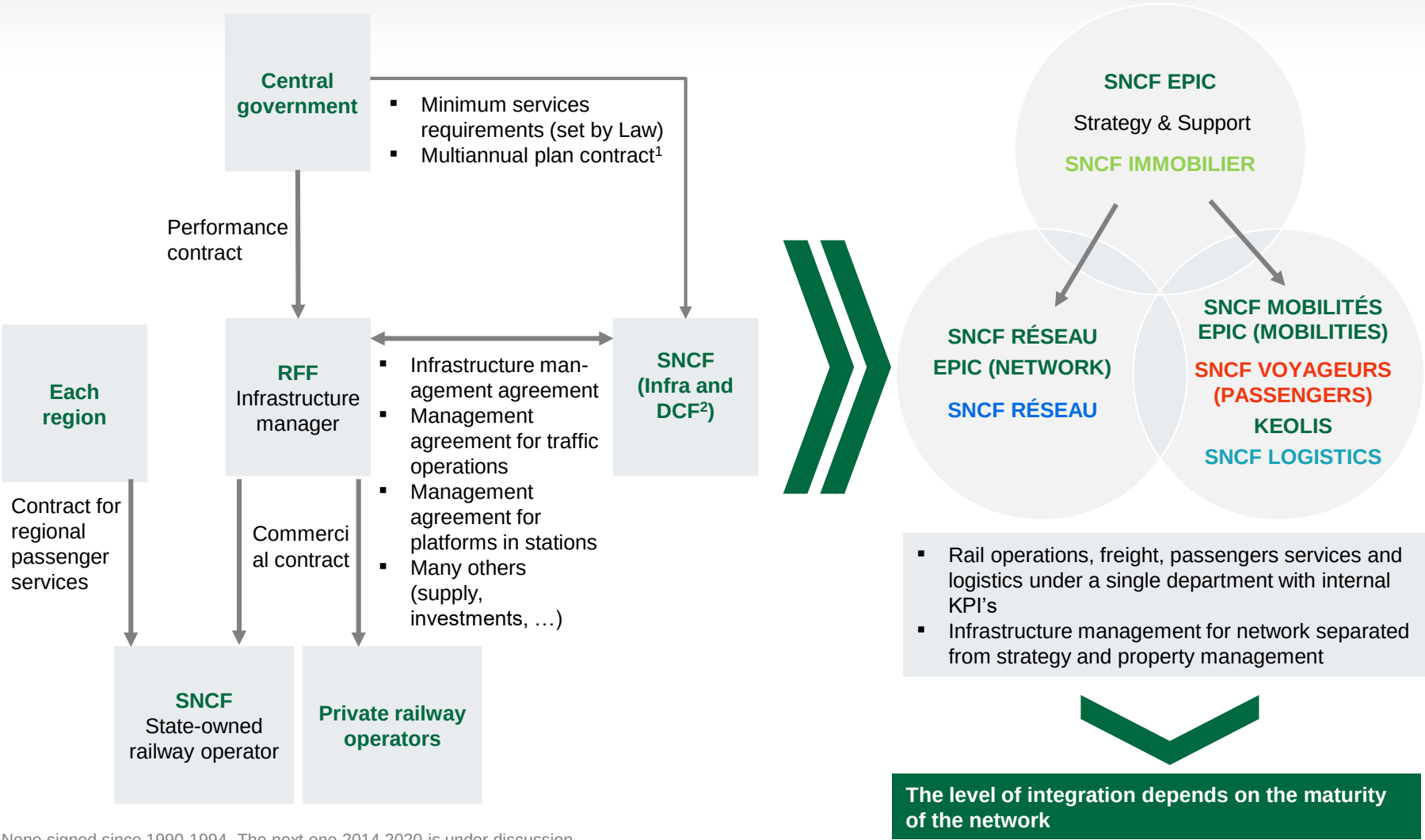
¹ Gares & Connexions provides transparent, impartial services to all rail operators

Rail development example - SNCF - The contractual relationships have been simplified to intra-organisation agreements



Pre-2015

Current

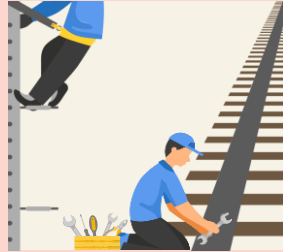


1 None signed since 1990-1994. The next one 2014-2020 is under discussion
 2 SNCF Infra is delegated for the maintenance of the network; SNCF DCF -Direction des Circulations Ferroviaires- is delegated for the management of the slots

There are 4 critical functions in rail

- Design, plan and construct new lines, line extensions and link rails
- Contract management for construction

Network Development & Construction



Fleet operations and management



- Line operations
- Fleet maintenance

- Track access,
- Traffic management,
- Infrastructure maintenance

Infrastructure management



Commercial traffic capture



- Sales & Marketing
- Pricing
- Account management



To determine the optimal organisation structure for ERC, five guiding principles could be considered...

Guiding principles

Maximize the size of the pie



- Sector governance to allow **for efficient competition against alternatives to rail** (road mainly) to **increase the profitability of the rail sector as a whole**

Define clear roles and avoid duplication of resources



- **Network planning and construction to sit under infrastructure owner** for standardized design and inter network connectivity

One unique operator for a small network



- **Rail operators** to determine cargo customers to maximize fleet profitability

Incentivize harmonious collaboration



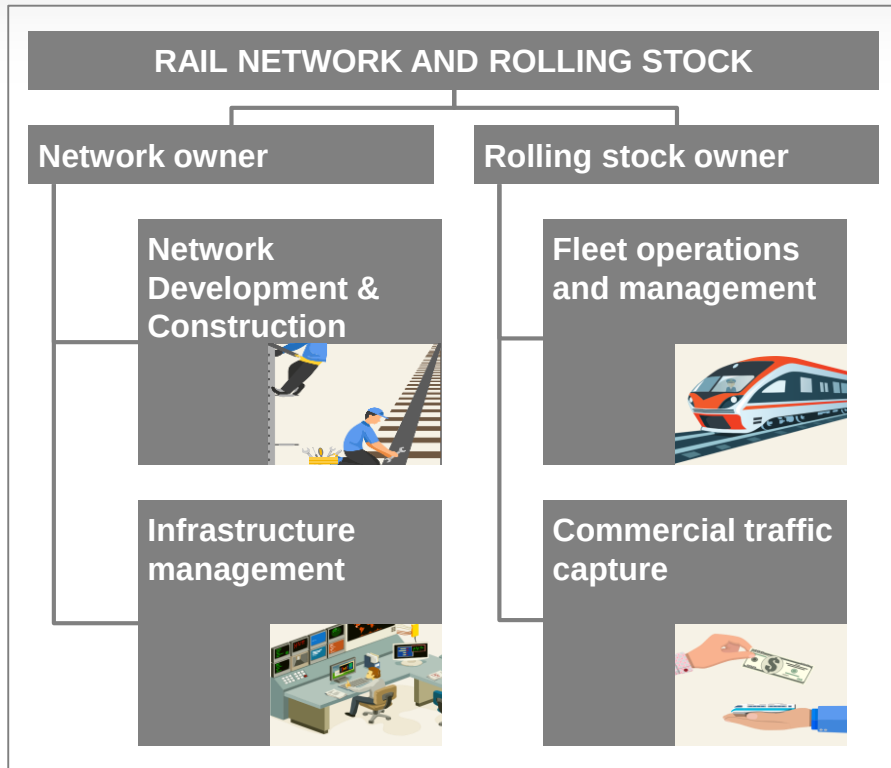
- **A network of less than 10,000Km to be unified across the country** to allow for intra-network rail operability
- **Infrastructure owner to have source of revenue to cover interest on loans** and part of capex investment costs

Implications

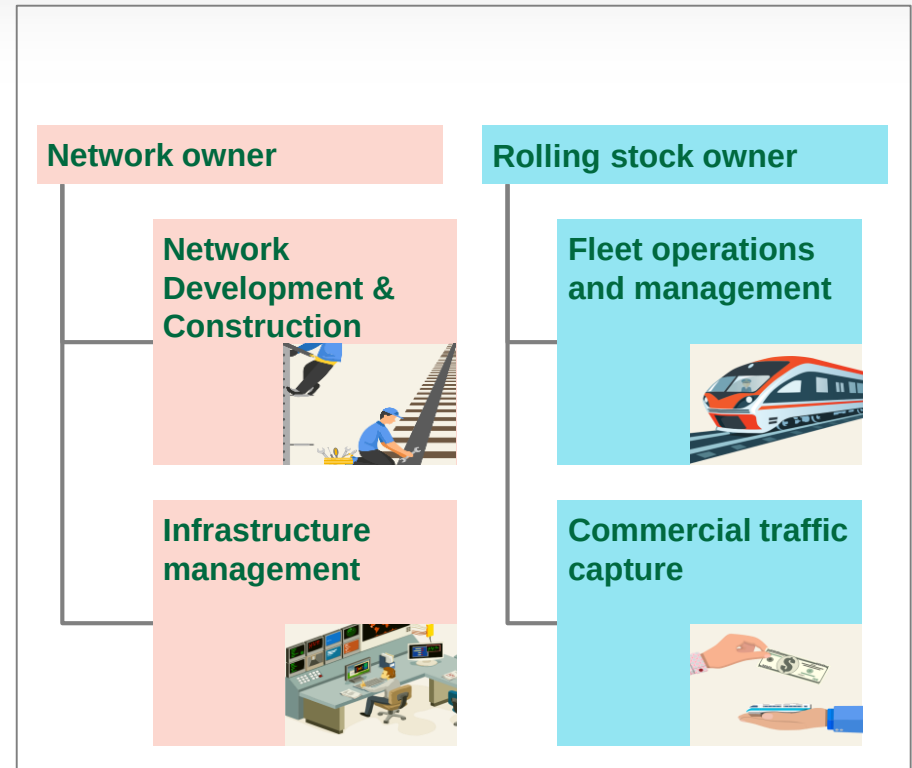
- **Set up the professions** (Marketing and sales, strategy) and **activities** (pricing, point to point logistics, etc) to **optimize rail competitiveness against road**
- Define the players to carry these activities.
- **Interoperability critical** for multiple operators and for traffic flows from the north to the port, planning and design should be under a single owner
- **Operations and business development for freight cargo/ passengers** managed by network operator to identify most profitable flows
- **Network access** managed by network operator to identify most profitable and efficient rail operators
- Track access to single or multiple rail operators to be charged to cover capex costs
- Network operations to be managed by infrastructure owner

... resulting in two optimal sector governance options for Ethiopia

Option 1 : Integrated model



Option 2 : Separated model



Rail network in Ethiopia should have clear roles for infrastructure owners and infrastructure operators

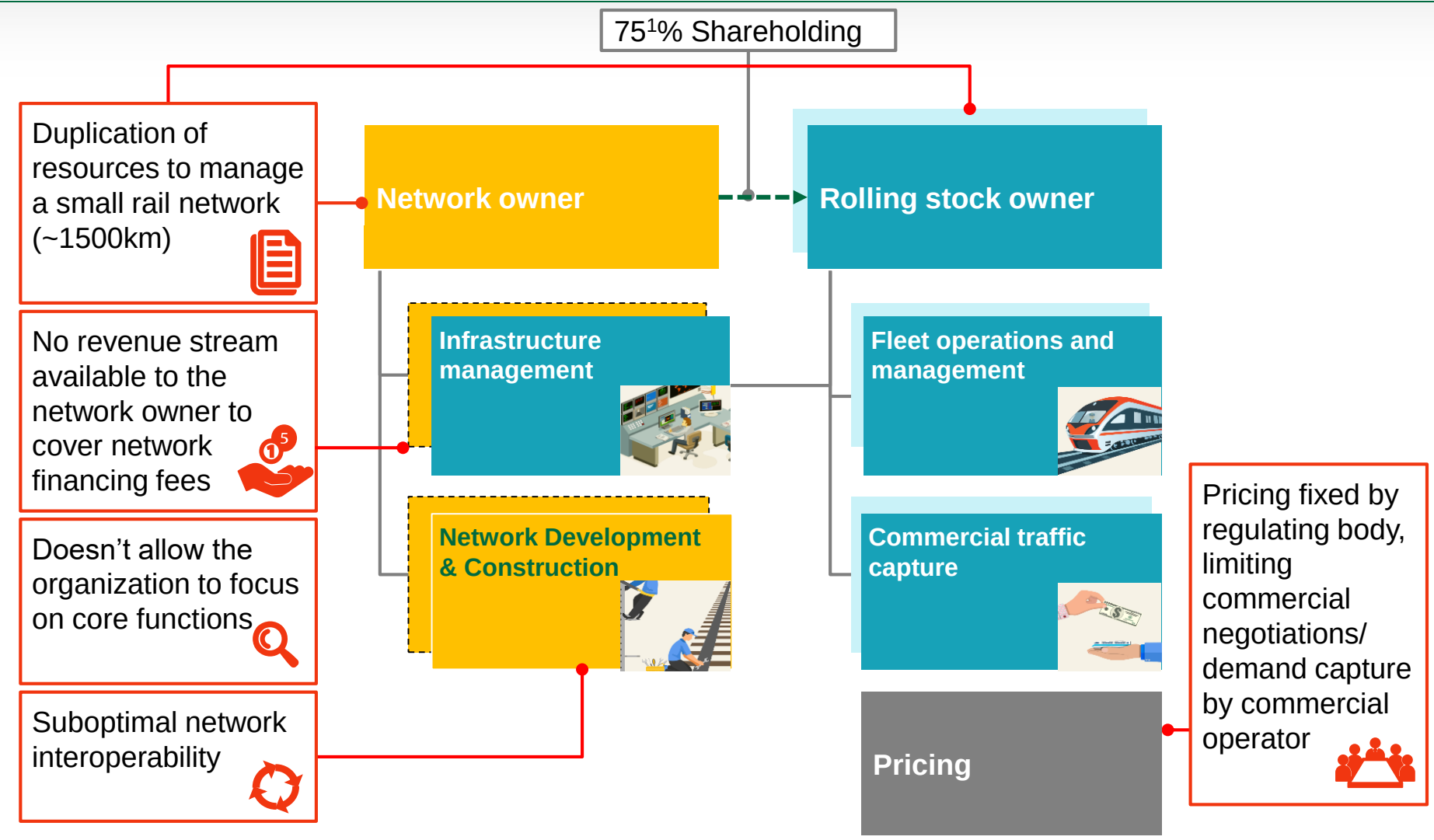
- The railway network is ideally unified to ensure technology compatibility and single point for track access
- Infrastructure and operations function are handled as separate profit centers
- Given the size of the network in Ethiopia (~1500km for Addis-Djibouti and Awash-Mekele), one operator could operate both lines
- Cargo capture would be part of the rail operation business, not of the network operation business

Current sector governance model in Ethiopia creates duplication of resources and doesn't set incentives for a optimal value creation



Planned Awash-Mekele operator Regulatory body EDR ERC Planned Awash-Mekele line Detailed below

Ethiopia current structure



1 72% owned by ERC, and 3% by MoFEC/MoPE/MoT



Current sector governance present strategic, operational, and financial challenges

Challenges

Potential mitigations

Strategic



- Sub-optimal competitiveness of rail compared to road due to
 - Incentives to optimize the value for single lines instead of the system
 - Limitations on demand capture due to fixed pricing
- Offering point-to-point service requires coordination between multiple stakeholders

- The Ministry to enforce optimal coordination through stronger oversight
- Pricing strategy redefined and under operator ownership

Operational



- Technical incompatibility between signaling systems on the Addis-Djibouti line and the Awash-Mekele line
- Small organizations with lack of synergies
- Replication of resources (network management, point to point logistics, etc)
- Payment replication between organisations

- Investments into signaling system to restore compatibility
- Regulator to develop standards to avoid similar mismatch on future extensions
- Bundle critical roles together (network ownership with network operations, rolling stock ownership with operations and customer relationships)

Financial



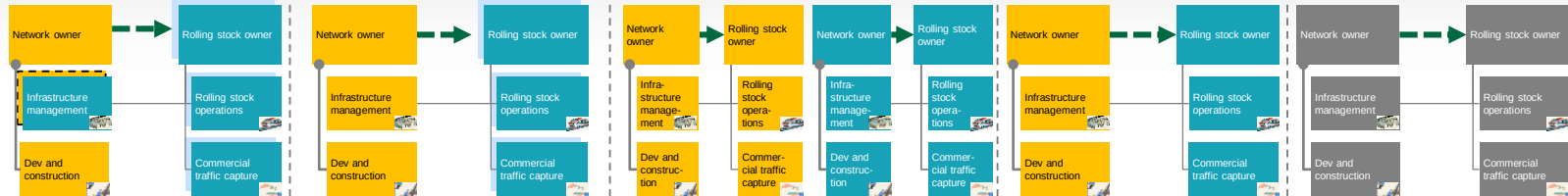
- Ethiopia to receive only 75% of Addis-Djibouti revenue, while taking on 88% of the initial capex

- Renegotiations with Djibouti
- Charging of fee for concession agreement to EDR



5 options could be considered to address sector governance challenge in Ethiopia, two of which are optimal for the sector

ERC EDR New operator for Awash-Mekele line



Adjusted current structure

- Maintaining the bilateral agreement
- Having a new operator operating the Awash-Mekele line
- Setting up a concession fee to be paid by the operators to the infrastructure owner
- The government to define technical standards to ensure network interoperability

Streamlining infrastructure and operations, with one operator per line

- ERC to own and manage the infrastructure for both lines
- Ethiopia and Djibouti to renegotiate the bilateral agreement
- One operator per line, with EDR to remain the operator on the Addis-Djibouti line
- Ethiopia and Djibouti to define access rules for the Awash-Mekele operator to the Addis-Djibouti line

Two stakeholders each owns and operates one line

- EDR to own, manage and operate Addis-Djibouti line
- ERC to own, manage and operate Awash-Mekele line

Streamlining infrastructure and operations, with EDR as the only operator

- ERC to own and operate the infrastructure for both Addis-Djibouti and Awash-Mekele
- EDR to be the only operator covering both Addis-Djibouti and Awash-Mekele lines

Integrated model with one stakeholder

- ERC or EDR to own, manage and operate the entire network

Description

Size of the pie



Resource duplication



Unique operator



Collaboration



Would require renegotiating the bilateral agreement with Djibouti

The Ethiopian government can plan an active role in supporting the development of the rail sector

■ Focus of the next pages



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- **Sector governance** : the Ethiopian government should revise the current sector governance structure as it present multiple critical challenges
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2

Regulations -

- **Regulations** – the Ethiopia government could further support the development of the sector through
 - Regulations to support the attractiveness of rail (including authorizing strategic pricing for rail)
 - Land development around passenger stations through PPP or concession models



Detailed next

The government can play an important role in supporting the development of Ethiopian rail through a strong regulatory framework and the development of partnerships for land development

Regulatory framework

- Set up the regulatory framework and policy in four areas:
 - Economic
 - Safety
 - Environment
 - Technical

Land development

Develop partnerships to encourage land development around key stations to spur appreciation and boost revenues



The government of Ethiopia could be involved in the regulation of railways at 4 levels

1 Economic



May include industry entry, service standards, and pricing of rail services (**or authorization of competitive pricing**), and/or access to infrastructure

2 Safety



Includes processes for protecting passengers, employees and communities, compliance and incident investigation

3 Environment



Includes the impact of rail transport on rail corridor communities and wider impacts such as carbon emissions

4 Technical



Includes technical norms and standards to ensure an integrated, safe and environmentally acceptable rail infrastructure and services network

Benchmark for the role regulators play in the railway sector

	Country	Regulator	Mandate	Reporting line
Rail 	 Turkey	Turkish State Railways (TCDD)	- Set rules and regulations - Construct conventional, fast & high speed new lines - Operate, expand and renovate the railways - Ensure the coordination and cooperation between its enterprises, affiliates and subsidiaries in the framework of the laws, bylaws, regulations, development plan and annual schedules	The supervision, coordination and relationships of TCDD at governmental level are managed by the Ministry of Transport, Maritime Affairs, and Communications
	 Japan	Railway Bureau, MLIT	- License and approve of railway companies - Set the caps for the pricing and - Set pricing mechanisms - Monitor, research and complete investigations - Set subsidies to the local railway - Invest in extending bullet train network	Ministry of Land, Infrastructure, Transport and tourism
	 New York state	New York State Department of Transportation	- Set vision, goals, objectives and plan for intercity passenger and freight rail systems - Develop policies and proposals to solve commuter issues across state and cities	-
	 UK	Office of Rail and Road (ORR), a non-ministerial government department	- Regulate all transport that run on rail (e.g. underground railways, light rail and tramways) - Responsible for safety regulation, economic regulatory delivery; is the competition and consumer authority for the industry	Works closely with the Scottish gov. and the DfT² Secretary of State for Transport appoints ORR board
	 Malaysia	Ministry of transport	- Set the regulations of the rail network - Active planning of potential rail transport development - Administrate and regulate key legislation and licensing of key transport service providers and vehicles	Prime Minister



The government can play an important role in supporting the development of Ethiopian rail through a strong regulatory framework and the development of partnerships for land development

Detailed next

Regulatory framework

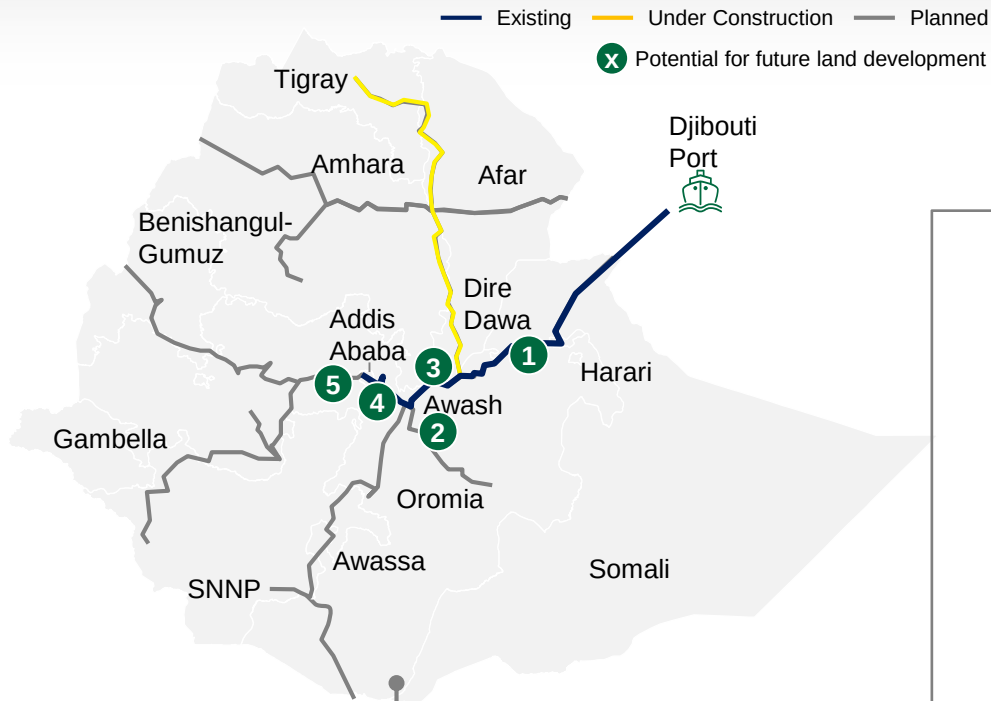
- Set up the regulatory framework and policy in four areas:
 - Economic
 - Safety
 - Environment
 - Technical

Land development

Develop partnerships to encourage land development around key stations to spur appreciation and boost revenues

ERC could develop unused land at Dire Dawa, Adama, Endode, Lebu, and Sebeta, leading to ~\$260M in land appreciation

Potential Station Development Locations



Selection Criteria

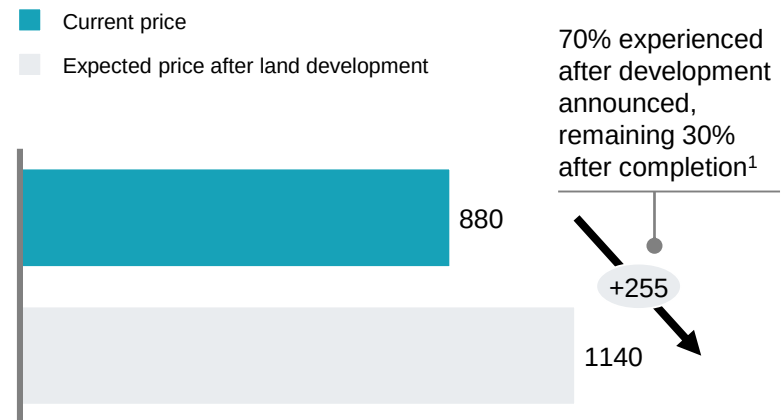
- **Proximity to population:** Successful land development depends on patronage of local population; cannot depend solely on passengers
- **Population income:** Population must be able to spend disposable income on goods/services offered at the location

Land Appreciation Potential

To maximize land appreciation from passenger stations, ERC should focus on locations with the following qualities:

1. **Connection:** Dense networks of streets and paths connected to the station
2. **Transit:** Development located near other high-quality public transport (e.g., busses from train station)
3. **Mix:** Plan for mixed use of station
4. **Densify:** Optimize density of surrounding area and transit capacity
5. **Compact:** Select regions with short commutes to station
6. **Shift:** Increase mobility around station by regulating parking and road use

Land appreciation around passenger stations¹ (USD Millions)



¹ Based on previous experience with city of population 10-12 million; national GDP/capita ~10,000 USD/person and land value of 3,200 Birr/square meter



Unused land monetization by governments typically follows a 5 step process

□ Focus of initiative □ Not applicable to ERC



Definition



Benefit

1 Land database	Developing a comprehensive land database capturing all municipality owned land including key characteristics e.g. location, size, zoning¹, FAR² etc.	- Enables complete view on all land assets to forecast potential revenues and identify funding needs - Allows effective urban and master-planning
2 Land classification and phasing	Classifying land based on attractiveness to develop an overall view, to aid in defining phasing of land monetization in order to maximize value, while minimizing government investment	Enables effective master planning and aids investment allocation (when to develop which parcel) based on priorities
3 Masterplan and HBU analysis	Reviewing land characteristics to ensure they are optimized for maximizing value (FAR, usage etc.) - Using tools such as pooling, redevelopment to ensure the parcels are optimal in size for monetization	Enables government to optimize land plots by aggregating where relevant to maximize monetization potential
4 Monetization archetype	Identifying monetization archetype which is optimal for each identified parcel of land – based on effort required and incremental increase in monetization	Enables government to make an informed decision on returns expected versus timing of cash flow based on archetype chosen
5 Deal execution	Execution of the deal based on archetype chosen – involves marketing/ promotion of the land to investors and bidding/ choosing an appropriate investor from those showing interest	Enables government to maximize value from the archetype chosen by ensuring relevant investors are paying at their maximum willingness to pay

1 Zoning of the land for usage – commercial, residential, mixed use etc

2 Floor to area ratio

Different opportunities exist for land-owning public entities; ERC would benefit most from a low involvement partnership



■ Potential opportunity for ERC

Development Model	Opportunity	Pros and cons	ERC's role	Options
Transactional	Auction sale of land	✚ ERC can leverage market prices in the short-term ✚ Development risk is completely shifted to private sector ✖ Provides one-off cash inflow; harder to maximize future value ✖ Loss of control of land use in the future ✖ Needs land & assets to be transferred to ERC	- Define land uses and criteria for auctioned plots - Set up and implement auctions through MoFEC - Coordinate with MoFEC and buyer to enforce development	
Partnership	Low involvement partnership	✚ Partnerships provide opportunities to generate recurring income ✚ ERC offsets capex & opex ✚ Private sector shares development risk ✖ ERC shares the demand risk ✖ Requires capability to manage and enforce deals	- Create proposals with funding and operating model - Submit proposal to MoFEC - Implement and monitor PPP with selected partner - Provide off-take agreement to share demand risk	- Joint Development Agreement (JDA) - Operate Build Operate Transfer (OBOT) - Build Operate Transfer (BOT)
	High involvement partnership	✚ ERC will have more control over the development ✚ ERC can provide strategic support to ensure city sustainability (i.e., through internal FM) ✚ Efficient delivery & operation ✖ Requires significant capability to set-up and grow companies ✖ Requires cash investment to build capability and brand ✖ ERC shares the demand risk ✖ Needs land & assets to be transferred to ERC ✖ Risk of low occupancy rates	- Set up the OpCo to enable partnership with private sector - Incorporate companies as partnerships with experienced private sector - Be the regulator - Monitor company performance and invest in growth	- Special Purpose Vehicles (SPV) - Joint Ventures (JV)

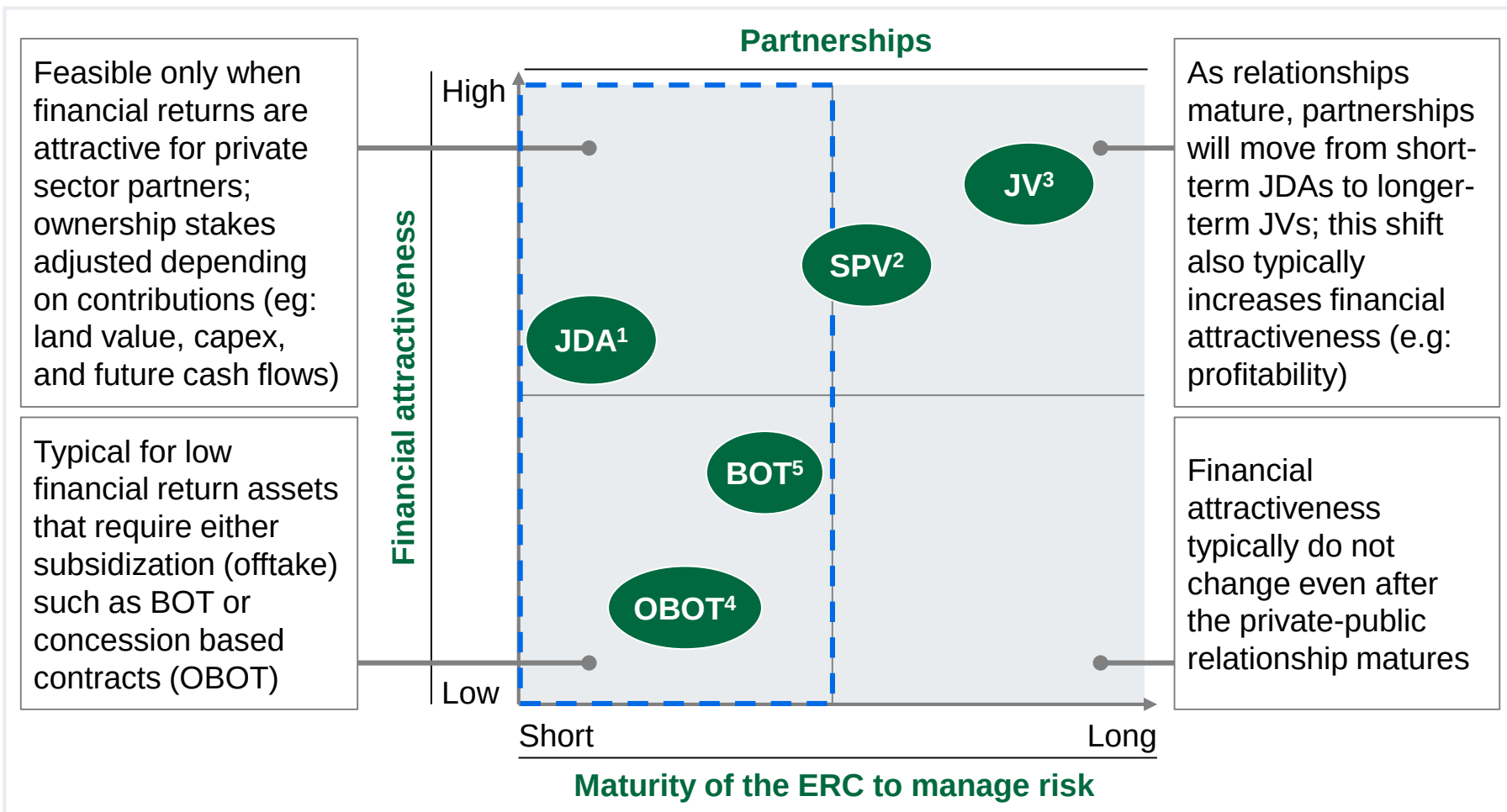
Setting up and leveraging the OpCo is regarded as being a longer term opportunity, initiated once ERC has amassed investment capability and experience

Low involvement partnership optimal for ERC because it allows ERC to eliminate capital investment and capability development while retaining revenues over time



Financial attractiveness and ERC's maturity are key criteria for selecting a PPP model; currently SPV and JVs are out of reach

 Current ERC standing



1 Joint development agreement – Public sector entity provides land for free and takes %age of revenues off the top, 2 Special purpose vehicles – PSE and developer enter into a single project agreement with joint share of risk and returns

3 Joint venture – Same as SPV but for multiple project agreement, 4 Operate Build Operate Transfer – Where investor will start off with a concession agreement for phase 1 and then will enter into a BOT for subsequent phases

5 Build Operate Transfer – Investor builds operates and transfer asset, after a set period, having recovered profits



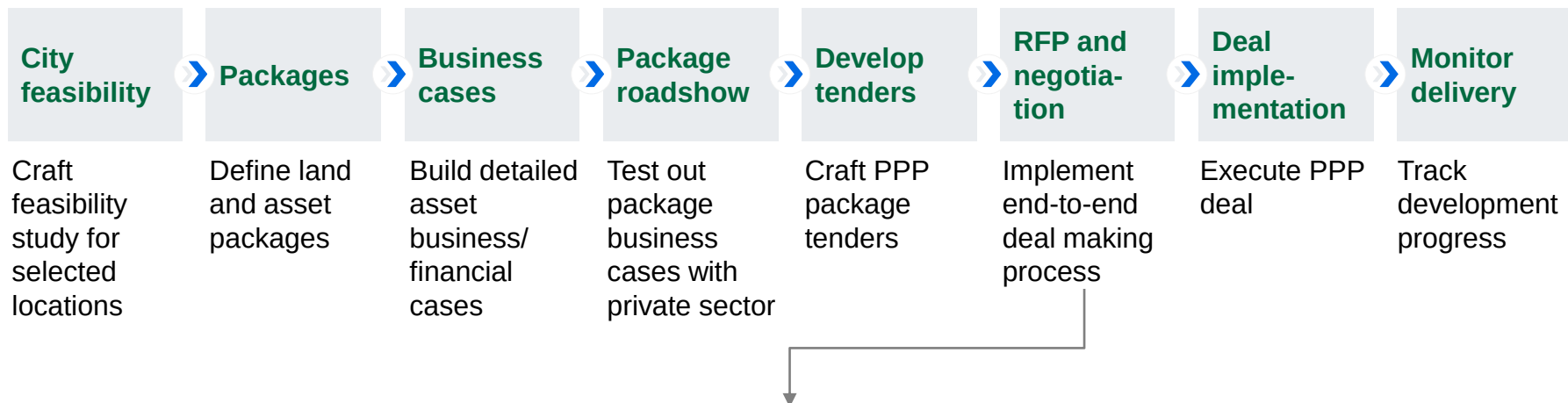
Phasing development can maximize values across land portfolio and help it to better forecast its revenue streams



- Evaluate potential of small prime and non-prime land
- **Select phasing strategy** to develop the land plots in time (short-, medium and long term) **to maximize monetization from each land** plot or for a group of land plots
- Develop short term (first phase) land plots with select partners
- **Identify new prime land**, due to:
 - Expansion of network to include Awash – Mekele line
 - Plans to open additional passenger stations (e.g., Indode)
- Reevaluate phasing strategy and selection of land plots to be released at different moments in time
- **Release land plots** with maximum monetization potential in next few years
- Acquire more land around future stations if additional stations are planned
- Expand existing developments which are profitable and have interested partners or identified sources of funding

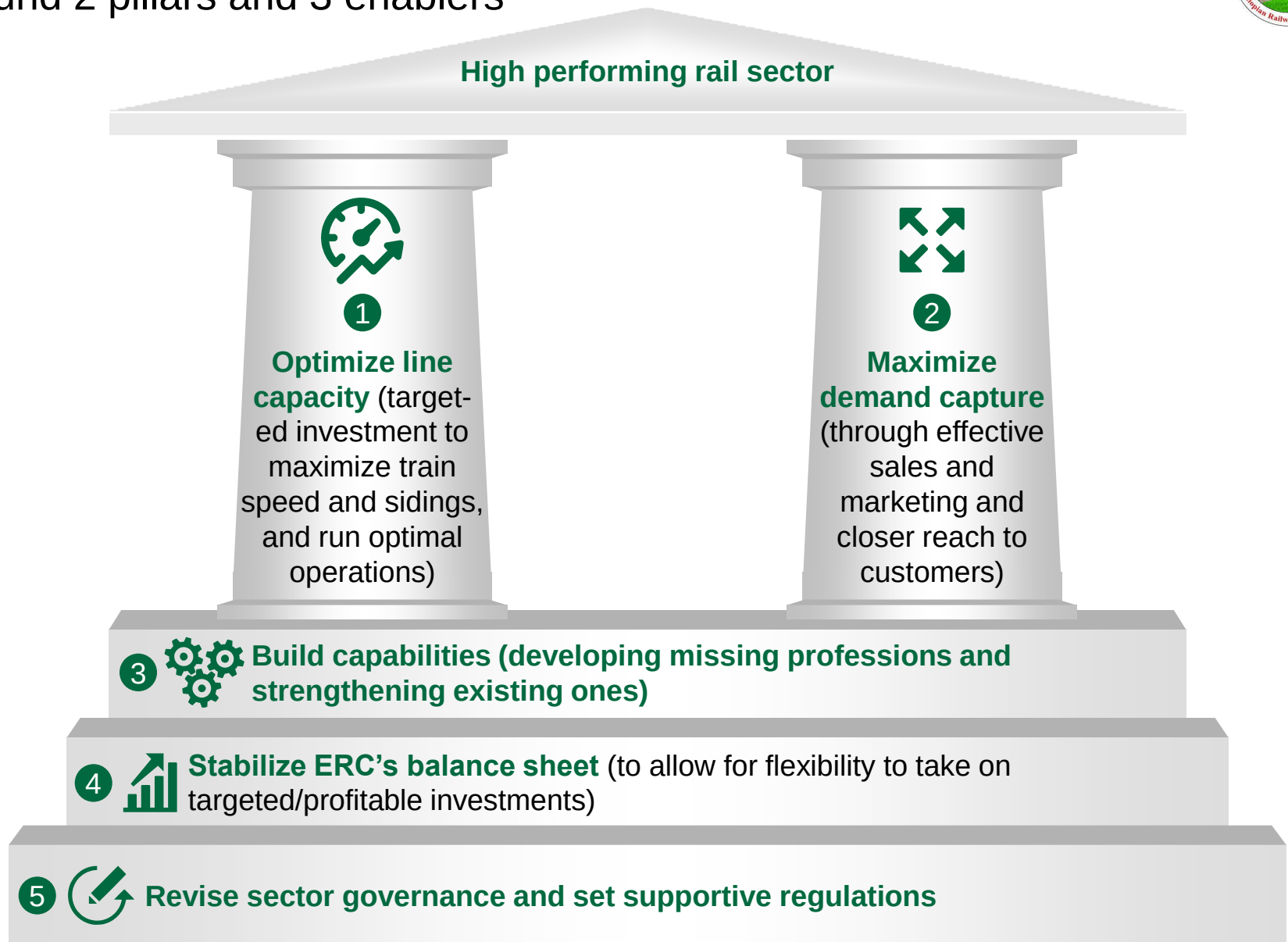


To execute the development, ERC should follow a clear process to partner with the private sector effectively



Criteria	Description	
Land-use zoning	- ERC should clearly define and register the land use criteria for the plot - Developers can only construct properties within registered asset class - Developers need approval from ERC to change plot zoning after development agreement is signed	
Design guidelines	- ERC needs to include guidelines in business registration in development agreement - Derived from location characteristics and value proposition - Post-agreement, ERC needs to enforce adherence to design criteria	
Development timeline	- To ensure that private plots are developed within ERC's target timelines, specific timelines need to be included in the development agreement - ERC can set a rule that states that plots need to be developed within 2 years, after which a tax is levied on undeveloped land	

ERC/EDR management has developed a transformation program around 2 pillars and 3 enablers



Each pillar is backed by a set of initiatives (1/2)

Value driver	What do we do	Why will it work
Optimize Line Capacity	O1 Capacity Optimization - Train scheduling, security, speed, and operations O4 Operational key performance review	- Relatively low capex investment can easily triple line capacity - Revising KPI's to include incentives to maximize volumes will drive increase in utilization
Maximize Demand Capture	O3 Demand Capture – Freight rail pricing review O2 Demand Capture – Business development unit and activities O5 Demand Capture – Define a strategy for to provide end-end logistics for freight rail S4 Implement optimal proposal structure for link rail PPPs	- Strategic pricing will allow capture of customers currently using road - Active focus on customer partnerships will increase customer diversity and cargo type - End-to-end logistics will attract export customers for agriculture and minerals as customers will have a single point of contact - Alternate ports allows for clearing of goods outside of ESLSE, attracting private container traffic such as Action Aid, WFP etc - Individual link rail PPPs offer savings to both ERC and private partners
Build Capabilities	H1 Leadership capability building H2 In-house skills development H3 Operate and transfer skill model H4 Provide roadmap for improvements on performance management, processes and systems and tools	- A first step is to identify the leaders of the transformation and ensuring they have the necessary skills to lead the change - Core rail functions need to be created within the organisation and the relevant skills developed/ built from new to ensure the organisation focus moves towards profitability e.g. contract management, sales and marketing, station operations - Staff satisfaction is key to an organisations overall health, simplifying processes, automation of replicated systems and defining targets against performance review will ensure overall organisation focus matches operation and revenue targets

1. Total value impact of recurring savings and revenue net of new recurring costs or decreased revenue

Each pillar is backed by a set of initiatives (2/2)

Value driver

What do we do

Why will it work

Stabilize ERC's Balance Sheet

- S1** Adopt optimal method for investment prioritization and prioritize planned lines
- S2** Improve contract mgmt. through standardizing contract terms, KPIs, and negotiating processes
- S3** Reduce infrastructure cost through standardization
- S5** Develop land around key stations to spur appreciation and boost revenues
- F1** Refinance or restructure existing debt
- F2** Find alternative ways to finance new lines, such as public private partnerships or concessions

- Standardizing prioritization will allow ERC to align all stakeholders around improving investment efficiency
- Improving infrastructure costs and contract mgmt. will allow ERC to drive down investment costs
- Developing land around Addis – Djibouti and LRT stations will add a revenue source for ERC and help balance finances
- Government should consider assuming ERC debt in their books since it is better equipped than ERC to refinance to local debt, and ERC can then be more able to finance smaller profitable investments (e.g., sidings)
- New lines are estimated to have an unattractive profit profile for private investors, and as a result, Govt. will have to finance if they are pursued

Revise sector governance and set supportive regulations

- R1** Define optimal structure for rail in Ethiopia and define core functions and positions required for efficient rail operations



- National network
- **ALRT**

Addis Ababa Light Rail is a passenger rail service with 41 trains and 2 lines, North-South and East West

Addis Ababa (phase 1) light rail transit route network drawing



Key facts

- Electrified light rail transit
- Total length of 34.3 km (North-South 16.9 km, East-West 17.4 km)
- Runs East-West from Ayat to Torhailoch and South-North from Kality to Menelik II Square
- 41 trains, with a design speed of 80 km/h

4 critical challenges

1

LRT operations have been generating negative margins (with ETB 3 billion loss in 2017) due to

- Low revenue driven by in general low ticket prices and a predominant purchase of the cheapest tickets suggesting potential fraudulent behavior given paper based ticketing system with limited controls on the line
- High costs mainly driven by recently expired O&M contract and consequent ForEx fees

2

Lack of precision on sections of the contract with the O&M operator has resulted in operational issues during the contract validity time, and a weak handover of operations to LRT, in particular on technical activities

3

Assets unavailability caused by lack of spare parts to perform maintenance of rolling stock results in high utilization of operating trains. This suggests that LRT is not fully capturing the demand for light rail transport

4

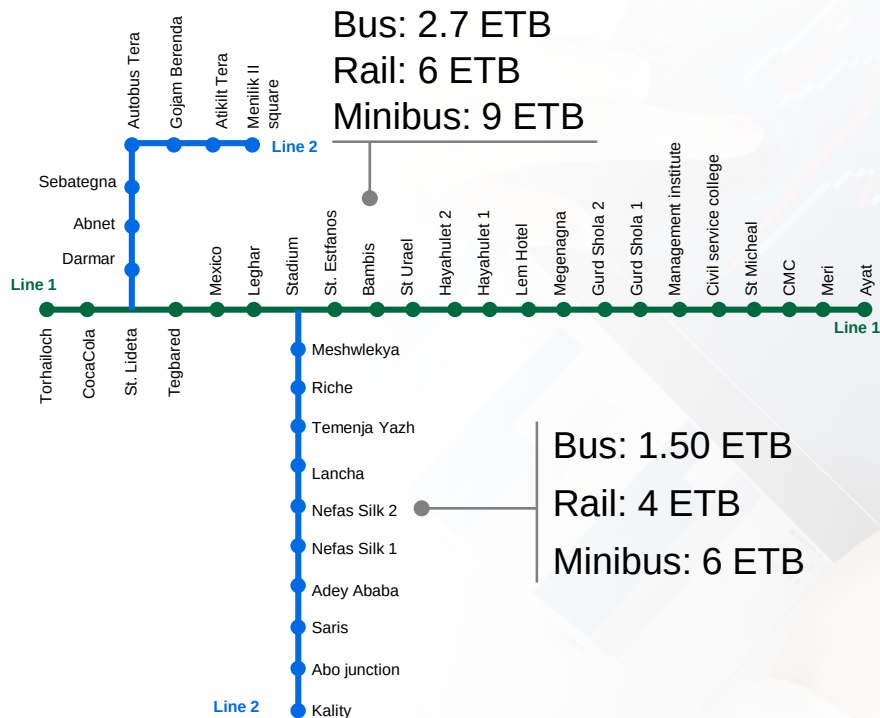
Power related challenges (incompatibility of technical components between LRT and the power company, and lack of efficient collaboration between the two entities) result in lost revenue given the frequent disruption of operations



1 Whilst pricing is competitive compared to other forms of transport...

LRT pricing is cheaper than minibus but more expensive than buses

Map



Pricing dynamics

Principle	Description	Rationale
Pricing based on distance	3 fares: 2 birr 4 birr 6 birr	Affordable transport for mass consumption

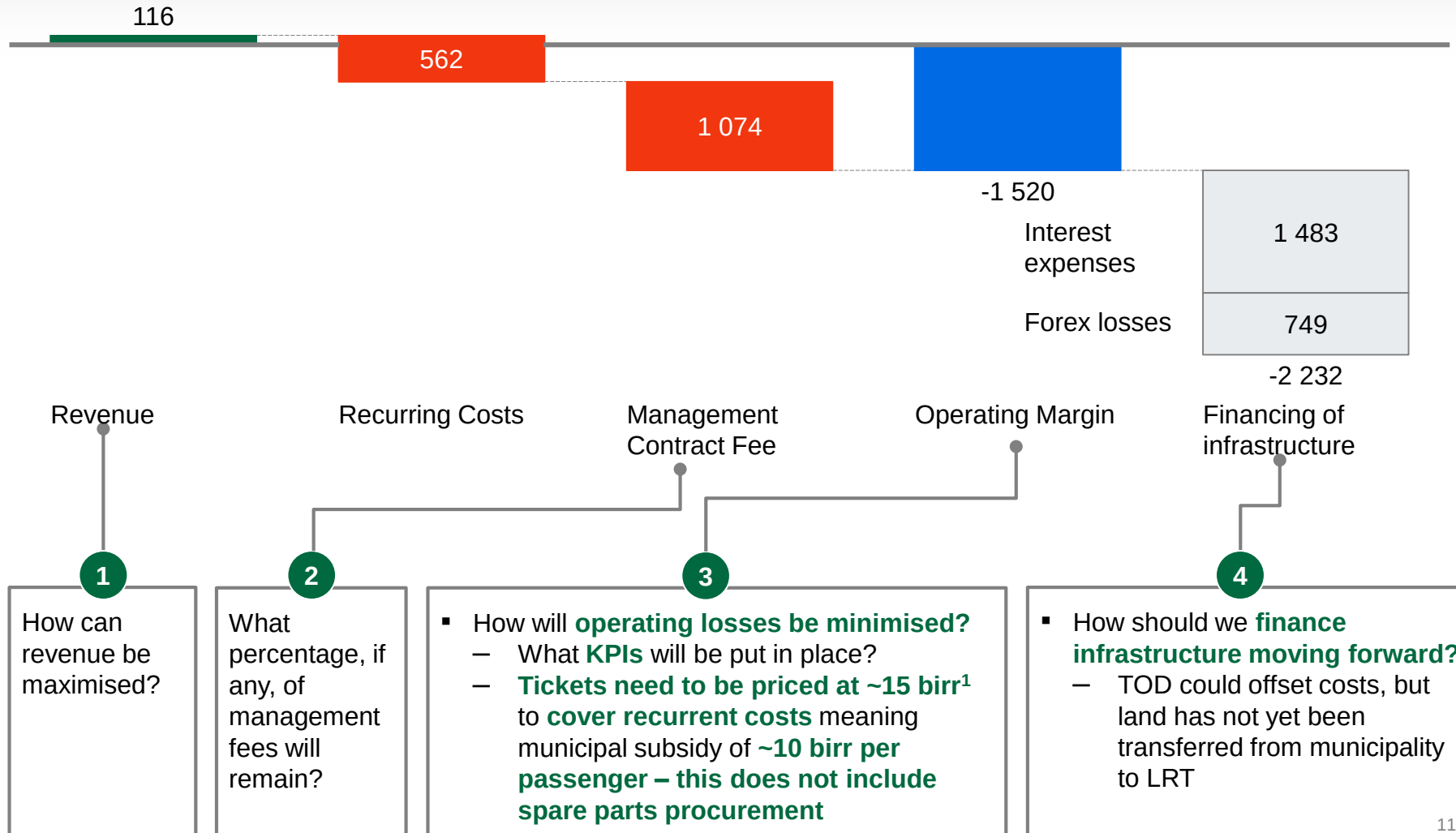
Low pricing compared to minibus attracts greater proportion of short distance customers putting pressure on current fleet



1 LRT is currently operating at a ~1300% operating loss; there are 4 key questions that will need be answered to ensure sustainability and secure subsidy financing

LRT Financials, 2010 E.C, 2017-8

ETB m

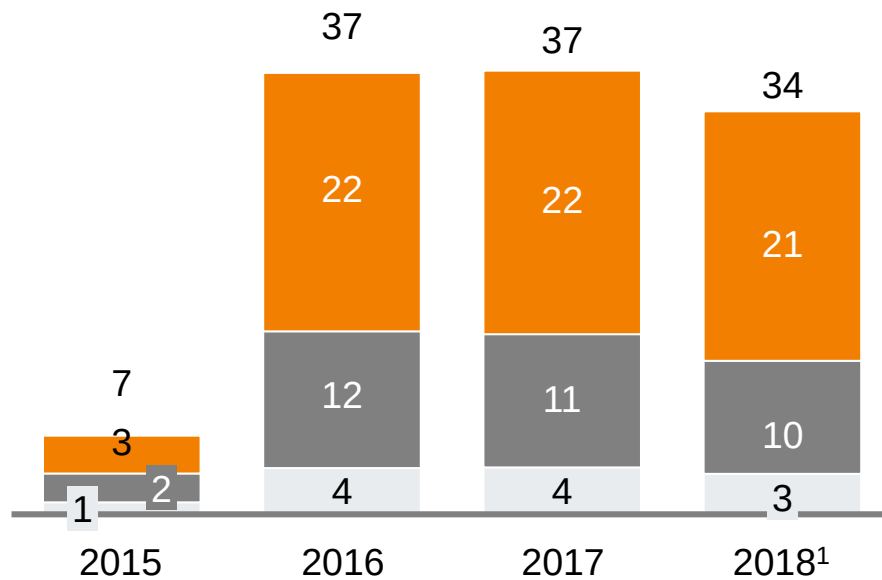




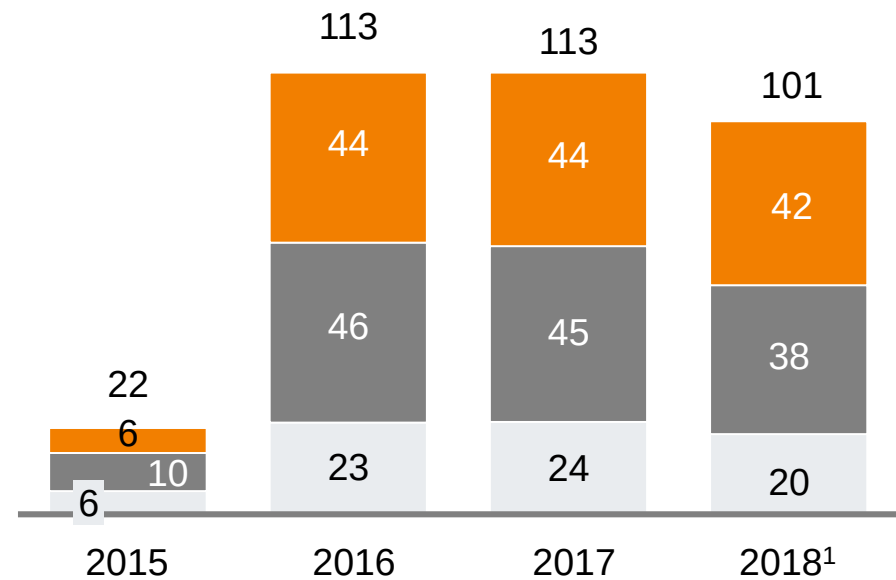
1 Over-emphasis on the 2 birr tickets indicates likely fraud in ticket purchases

2 birr 4 birr 6 birr

Number of tickets sold by ticket price, 2015-18, m tickets



Revenues from ticket sales by ticket price, 2015-18, ETB m



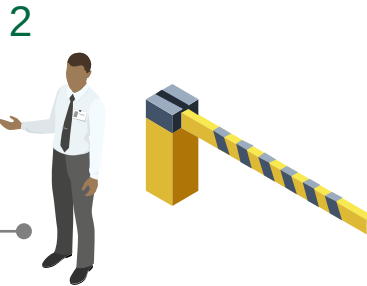
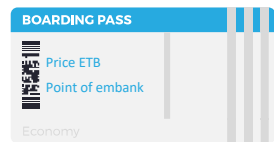
- 2 birr tickets accounted for greater than 50% of annual ticket sales from 2015-18, this has implications on scheduling and potentially leads to differing utilization on routes
- Large numbers of cheaper tickets being sold suggest potential fraudulent behavior or too low a threshold for the cheapest grade (8 stops)

¹ Data until Nov 27 2018

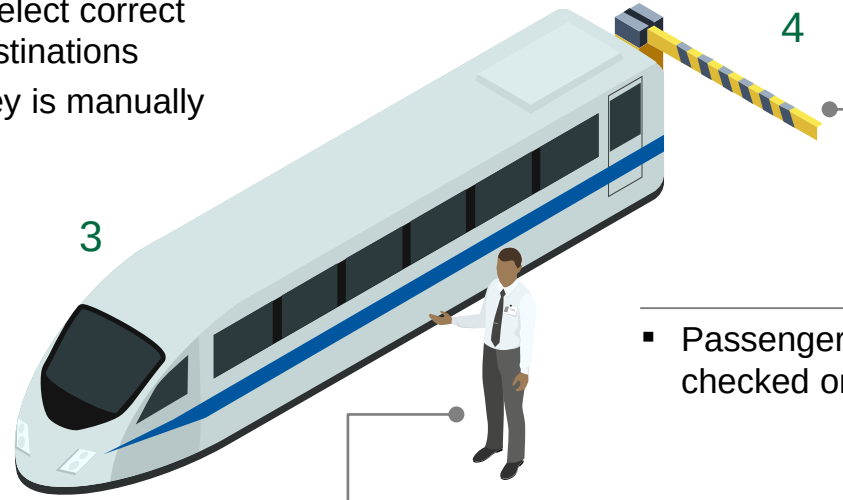
1 Ineffective access point management mechanisms and manual ticketing operations increase risk of sub-optimal sales due to fraud

- 1
- 
- 3 tickets, 2, 4, 6 Birr
 - Ticket pricing depends on length of journey
 - Sales people manually select correct tickets based on final destinations
 - Beginning point of journey is manually handwritten on all tickets

Ticket



- No physical barriers
- Manual ticket inspections
- During peak times difficult to check everyone has a ticket and whether they have the right tickets



- Passengers not checked on exit

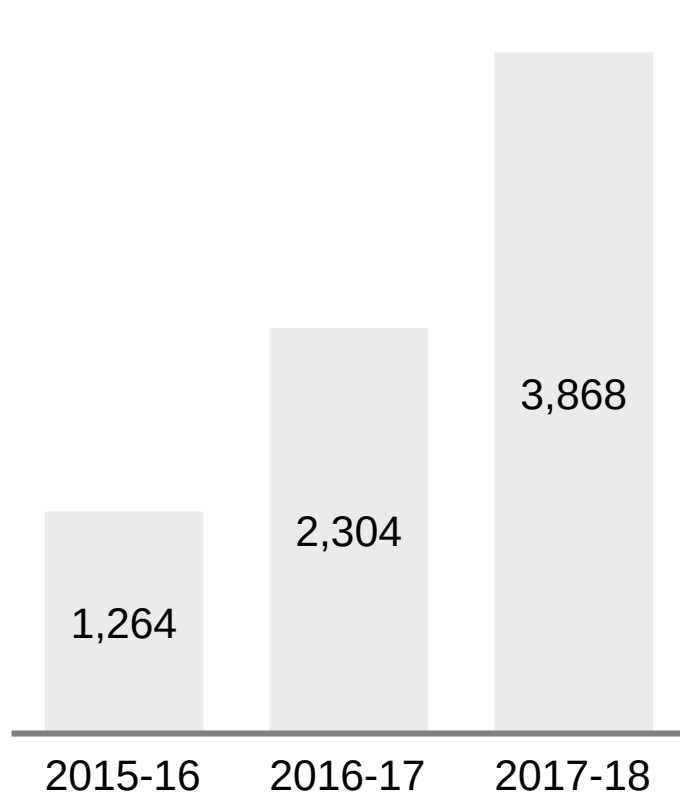
- Ticket inspectors can be found on-board at random intervals
- Difficult to check on board during peak times
- Key facts
 - 25 on board ticket inspectors, 172 gate inspector volunteers, 19 on platform inspectors
 - Penalties are less than 100 birr

Inefficient ticket controlling system potentially encouraging fraudulent behaviour

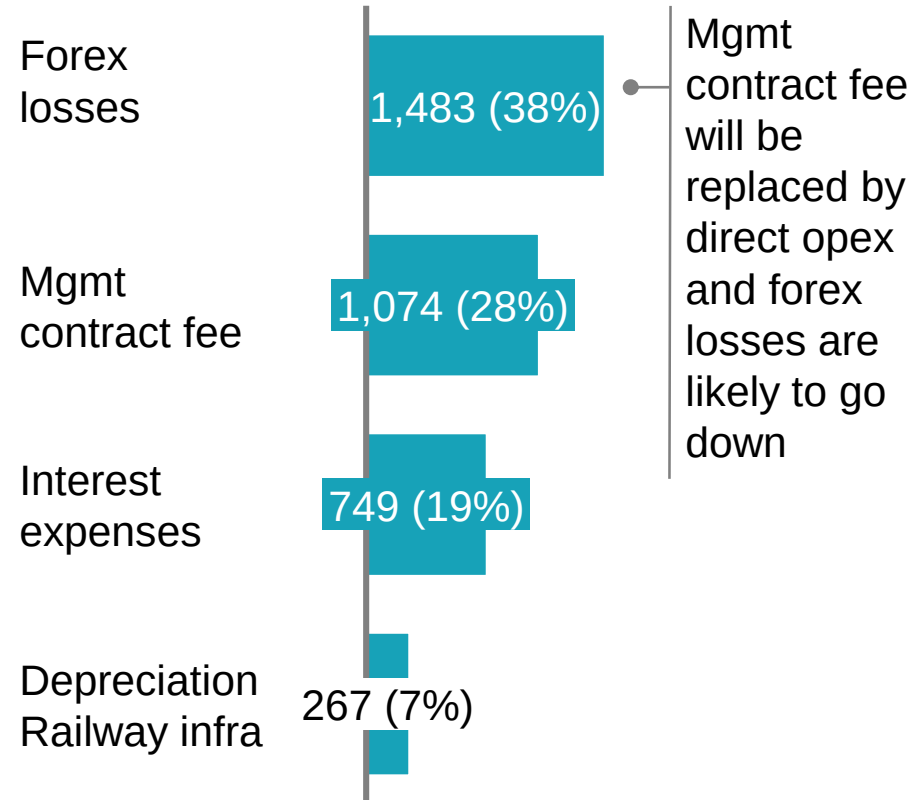
1 High costs are driven by management fees, interest charges and forex losses; together they account for >80% of all expenses

Operating cost, 2016-18,

ETB m,



Split by category, 2017-18, ETB m, %



Elimination of mgmt. contract fee and addition of additional opex required to operate line will affect cost structure greatly and will be explored

An operating contract was signed in 2014 between ERC, China Railway Group and Shenzhen Metro Group...



Description

Contract value

- Contract set up to be paid partially in Ethiopian birr and partially in US dollars
- \$111,459,438.41 and ETB 90,931,965.10

Responsibilities

- Steering Committee: oversight, setting strategic direction and external stakeholder coordination
- ERC: performance management, preparation for handover
- Management contractor: operations, preparation for handover

Timeframe

- 3 years, Dec 2014- Dec 2017

Performance management

- 8 KPIs, 4 against safety and 4 against operations
- 5% to 10% of total management fees were at risk depending on performance of operator a weighted average of 80%-90% or 70%-80% respectively against KPIs
- Results under 70% open up grounds for termination of contract

2 ... presenting multiple areas of improvement

PRELIMINARY



● Positive assessment ● Negative assessment

Evaluation area

Criteria

Evaluation

Comments

Contract setup

1.1 Does the contract have clear and measureable objectives and clear terms and conditions?



No clear description of linkages with other contracts
Potential for extension referred too but process not outlined in current contract

1.2 Does the contract have actionable and easy to manage penalty and bonus structures?

N/A

Clauses for penalty structures are in place but specific management procedures not specified in detail

1.3 Does the contract incentivize a cost efficient behavior, e.g., cost efficient balance between preventive vs. corrective maintenance?



Incentives not in place

1.4 Does the contract support the right level of service levels to support business needs?

N/A

1.5 Does the contract sufficiently differentiate service levels (geography, time etc.) to support business needs?

N/A

Contract management

2.1 Does the organization have standard contract management processes and tools to optimize follow-up and cost efficiency of contract?

N/A

Contract specifies regular reporting cadence against KPIs

2.2 Does the contract have a clear demand management process to ensure optimized volumes both from within organization and from supplier?



Guidelines do not exist

2.3 Does the contract have an effective governance structure ensuring healthy relations between organization and suppliers?

N/A



2 As a result of these weaknesses, the LRT division faced difficulties with both management and handover of operations

a

Mismanagement of operations by operator

Description

Various operational issues occurred

Effect

LRT was unable to recoup full benefits from Addis line due to missed opportunities

b

Unstructured handover of operations to ERC

ERC is experiencing significant capability building gaps

Unless capability building gaps are addressed, there remains a big delivery risk

2 LRT's assessment of the O&M contractor revealed 17 critical issues that are yet to be addressed

Category	Identified issues	Description
Operational issues prior to handover	Lack of detailed standardized working procedures	High level working procedures have been defined but these have not been translated into detailed workflows
	Delay in implementation of electronic fare collection systems	Electronic fare collection systems have not been implemented
	Failure of various pieces of auxiliary monitoring equipment	Delays in maintenance of screens, cameras and power surge protectors (UPS)
	Lengthy interval times between trains	Due to lack of trains, train interval times have been set at 15 mins
	Intermittent power supply	Issues with tech mismatch between power surge protectors of ERC and the utility (EEU)
	Delay in procurement of ICT systems	The appropriate ICT systems have not been procured
	Emergency rescue protocols	Revamp current emergency rescue protocols
Issues related to the handover	Safety drills	Programme of regular safety drills not in place
	Lack of international procurement processes	General delay in procurement of spare parts - some parts have been delayed for over a year
	Lack of rolling stock spare parts	
	Lack of escalator replacements	
	Lack of replacements for faulty axle counters	
Other	Delay in critical maintenance of bogies (undercarriage)	Lack of maintenance capabilities
	Delayed payments from ERC to operator	The operator has payments from ERC outstanding
	Tax fine due to delayed payments from ERC to operator	Due to delay in payments, operator received a fine from the tax authority (ERCA)
	Approval of assessments	To be confirmed with DCEO Muluken
	Delay in ERC issuing operator with performance certificates	Due to other outstanding issues raised, ERC withheld the operators certificates of good performance

WIP: identification of measures taken to resolve these issues and the status update on resolution

Critical operations activities fell under the responsibility of the O&M contractor



O&M contractor
 AALRTS staff
 Combination of AALRTS and O&M contractor
 Possibility of outsourcing to experts that are jointly managed by contractor and AALRTS

LRT operations

PRELIMINARY

Activities under main LRT operations

Admin	Sales	Operations	Maintenance	Safety and Security
HR	Ticketing	Scheduling	Scheduling	Emergency drill
Finance	Distribution and Settlement	Monitoring	Inspection	Liaising with local enforcement
	Inspection	Driving trains	Maintenance	Implementation of safety and security procedures
	Customer handling	Signaling	Material supply	System installation for security of AALRTS asset
	Implementation of flat rate	Station management	IT system	

2 Critical capabilities haven't been effectively handed over to LRT by the O&M contractor (1/2)

Operator activities	Capability	Explanation	Current status of the capability transfer		
			Low	Medium	Max.
Maintenance	1. Technical engineers	LRT is still receiving assistance from O&M contractor indicating insufficient capabilities		✓	
	2. Link to the manufacturer (supply chain)	A direct procurement chain has not been established	✓		
	3. Lack of maintenance			✓	
	4. IT system for stock management, performance management and for any activity	These functions are yet to be supported by IT	✓		
Operations	5. Monitoring day to day operations, and giving rescue management during emergency				✓
	6. Time table planning/scheduling	LRT is handling scheduling but does not have enough technical experience in scheduling		✓	
	7. Management of the drivers			✓	
	8. Management of stations		✓		
Administration and Finance	9. Designing, planning, organizing and implementing the administration and finance system		✓		
	10. Performance management		✓		
HR	11. Training organization	There are quality concerns. Trainings and evaluation procedures are not comprehensive or properly scheduled		✓	

- LRT is currently using a separate system to administer and organize finances and asset administration that used by the O&M operator
- There was no knowledge transfer in this area



2 Critical capabilities haven't been effectively handed over to LRT by the O&M contractor (2/2)

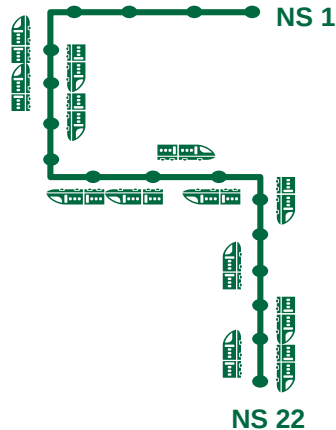
Operator activities	Capability	Explanation	Current status of the capability transfer		
			Low	Medium	Max.
Sales	11. Cash management	LRT staff are managing operations but the system is manual and there are weaknesses	✓		
	12. Ticket pricing			✓	
	13. Manage ticket production	Common electronic payment systems are not yet available meaning passengers are unable to transfer seamlessly from one mode of transport to the other		✓	
	14. Coordination with other transport		✓		
	15. Assure the execution of the fare policy	Flat fare	✓		
	16. Implementing e-ticketing system	Pending	✓		
Safety and Security	17. Maintaining the security with local enforcement			✓	
	18. Implementing security procedure for client and the employees	Emergency drill procedures have yet to be implemented		✓	
	19. Security of AALRTS asset (system installation for protection)	There is a shortage of CCTV cameras	✓		
	20. Emergency drilling	Pending	✓		
	21. Pedestrian bridges and addressing level crossings	Currently many stations have delays as trains have to prioritize passenger crossings and vehicle crossings which is a dangerous situation	✓		

▪ A proposal for a flat fare was developed by both the LRT and the O&M operator is under review

3 In 100 days, LRT can reduce lead times to 12m on EW line but with fully operational fleet, LRT can get to 12m for both lines

North-South line

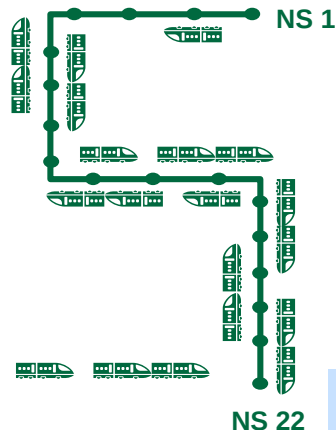
100 day plan



3-4 coupled train running
5 single trains running
120 minute round trip circuit

= ~13-15 minutes lead time

Fully operational Fleet

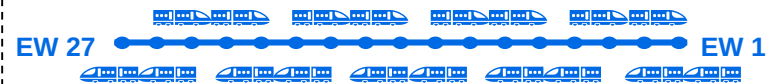


7 coupled trains running
3 single trains running
3 trains in maintenance or stand by
120 minute round trip circuit

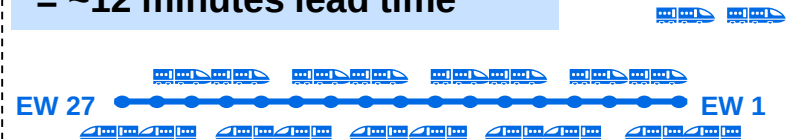
= ~12 minutes lead time

East-West line

9 coupled trains running
90 minute round trip circuit
20 minute buffer for re-route
= ~12 minutes lead time

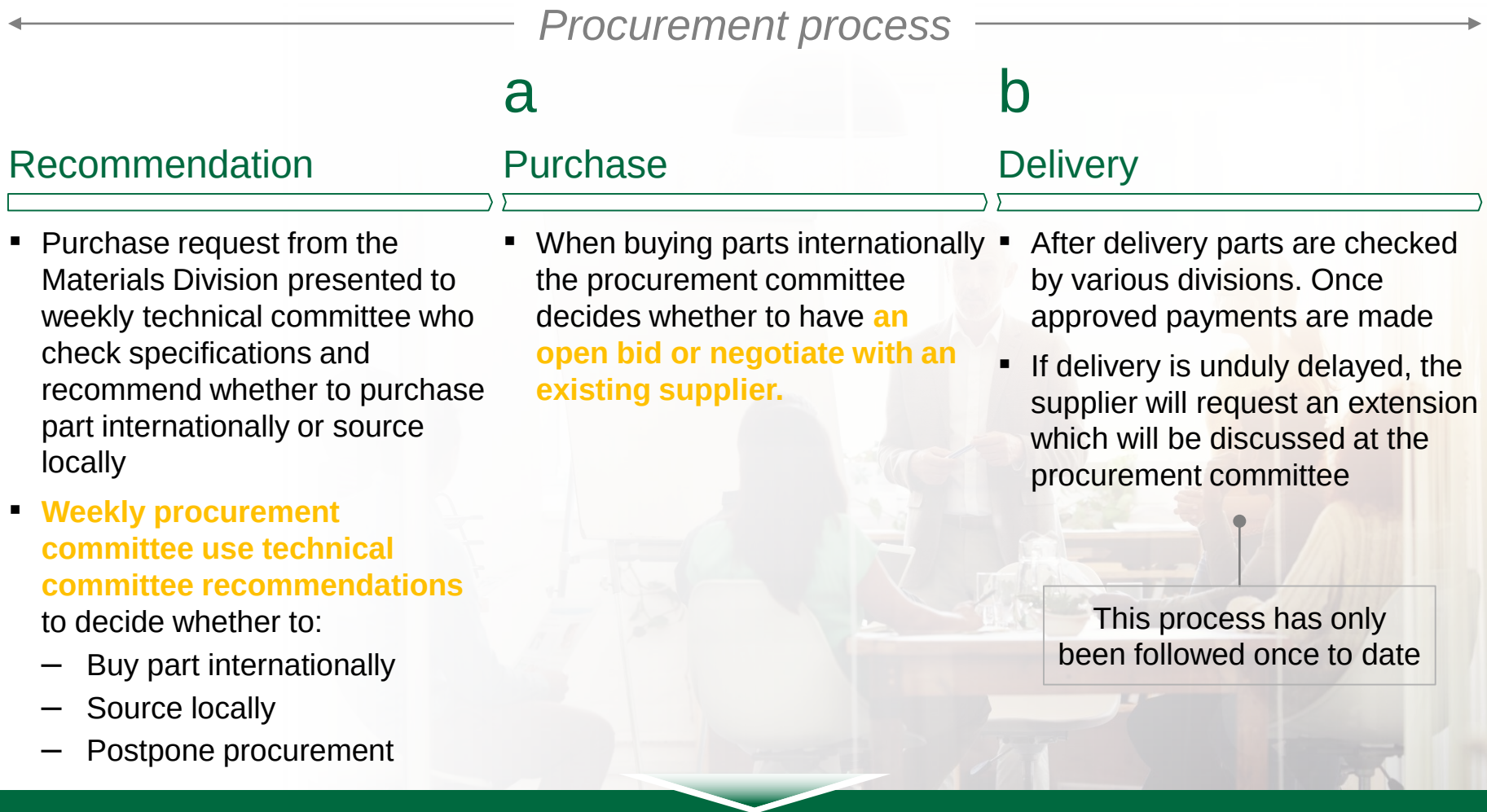


9 coupled trains running
2 trains on standby or maintenance
90 minute round trip circuit
20 minute buffer to re-route
= ~12 minutes lead time



- Current wait times across system are 15+ minutes, mainly driven by shortage in conductors (not by shortage in fleet), which has been rectified over last 6mo (~120 conductors to ~180 conductors)
- By Dec. 15 EW line will add an additional coupled train into operations, bringing lead time to ~12m

3 Current procurement process presents inefficiencies



Current procurement done on ad-hoc basis suggesting long procurement cycles and missed opportunities to leverage LRT economies of scale

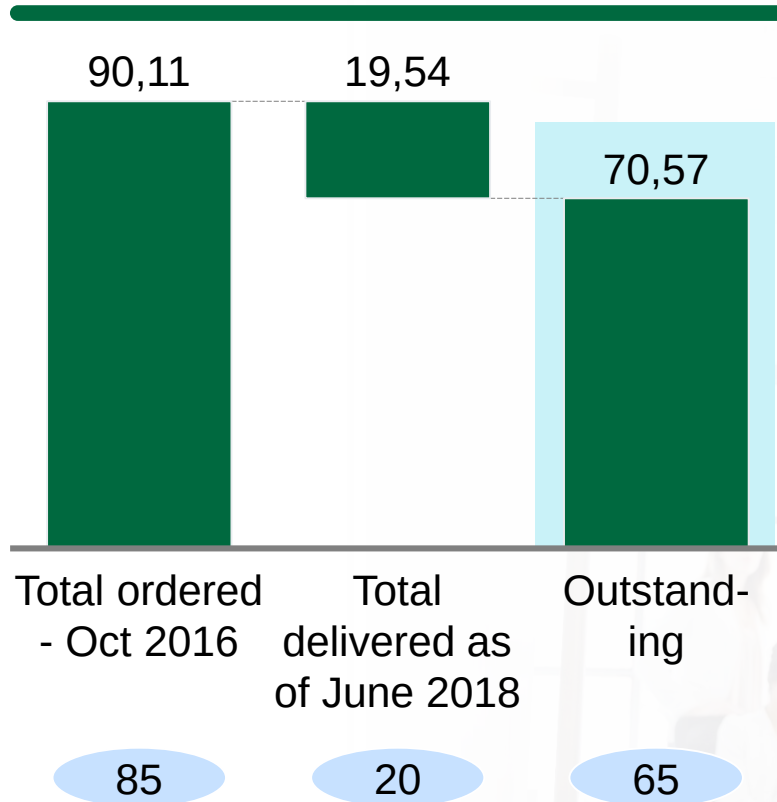
3 In addition, delays in delivery are further compounding the availability of spare parts

x

Number of items

Amount and value of ordered items

#, ETB m

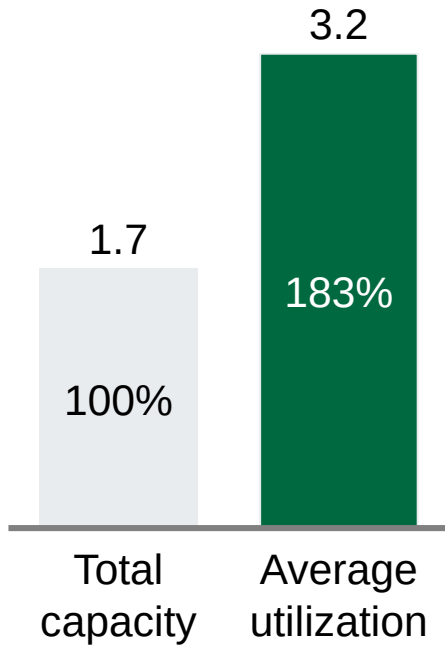


- The supplier of the outstanding items has highlighted a lack of Forex as the main cause of delays
- LRT has limited bargaining power since there is only one specialized supplier of major train parts

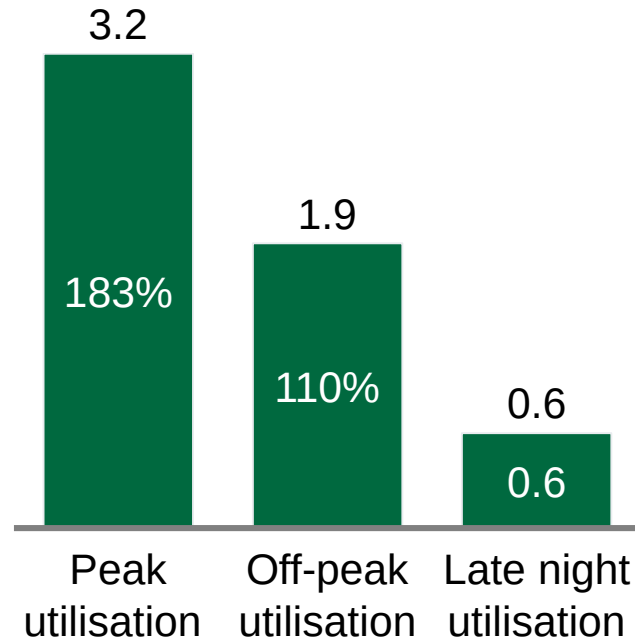
76% of ordered items, representing 78% of total value have been delayed by more than a year which is likely a contributing factor for trains being out of service for over a year

3 Overutilization of operating trains suggesting potential to capture more demand

Utilization of total capacity, Mn hourly passengers per year,



Breakdown by time of the day, Mn hourly passengers per year



Over-utilisation of trains during both peak and off-peak times indicates that adding more trains will lead to an increase in sales

Key assumptions

Peak times

06:00 – 09:00 and
16:00 – 18:00

Off-peak

09:00 – 16:00 and
18:00 – 20:00

Late night

20:00 – 22:00

4 Artificial outages due to mismatches between ERC and EEU¹ technology lead to increased downtime of LRT rail line

Situation

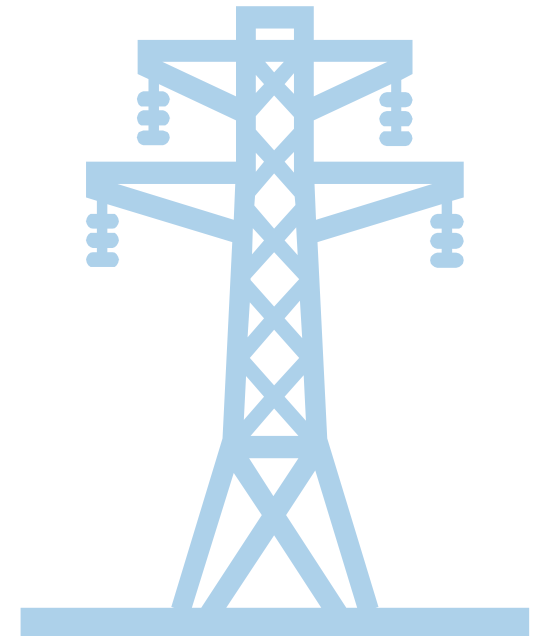
- Despite having a dedicated line, the Addis Ababa light rail experiences frequent outages
- The devices that the Ethiopian Electric Utility uses to provide protection against surges at its substations cut off electricity 3 seconds after a surge, as opposed to the 9 seconds that the ERC devices employ.

Challenge

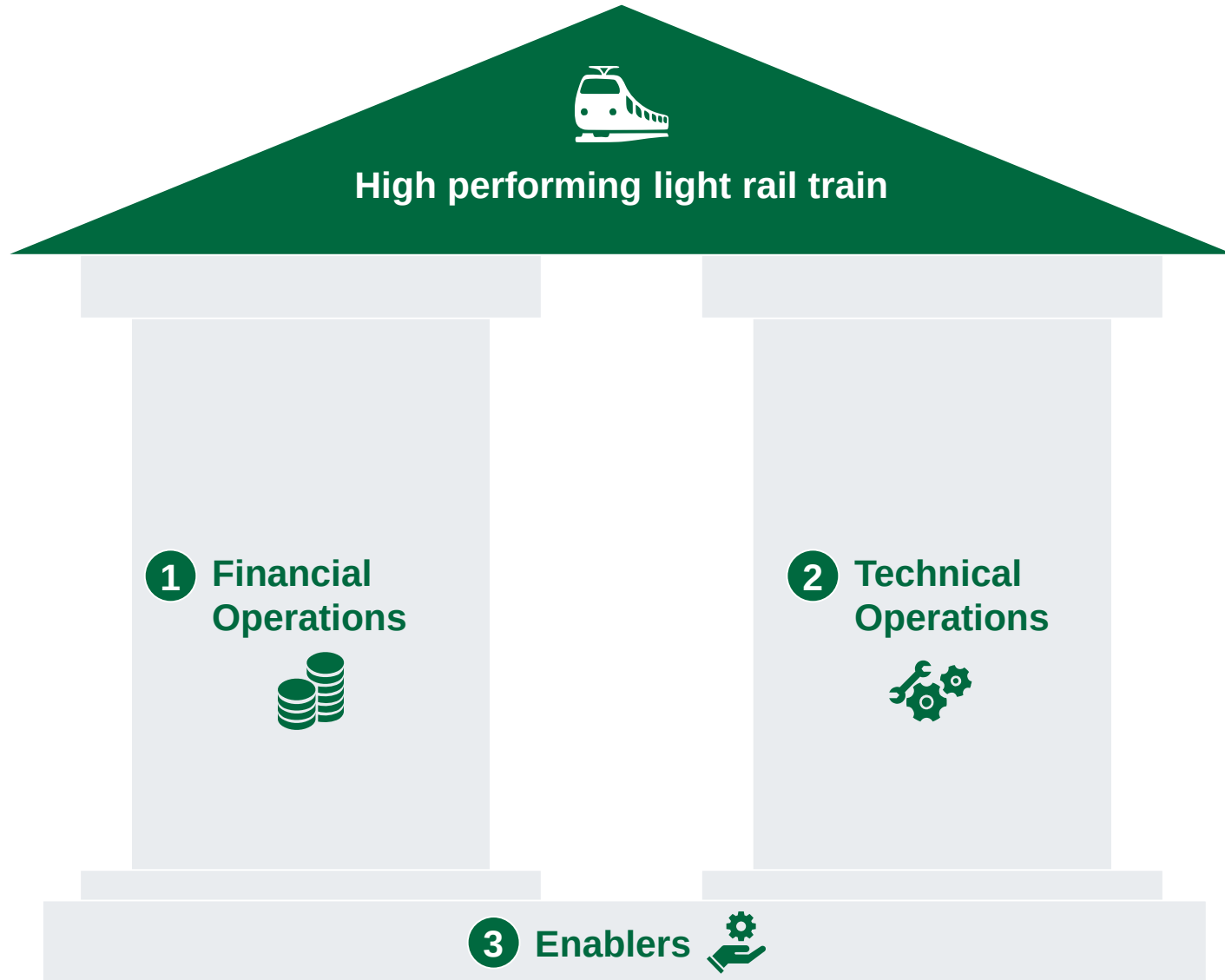
- Artificial outages at ERC substations due to the low cut off time of ERC surge protectors creates disruptions in LRT operations, causing delays and customer dissatisfaction, eventually leading to lost revenue

Attempted solution

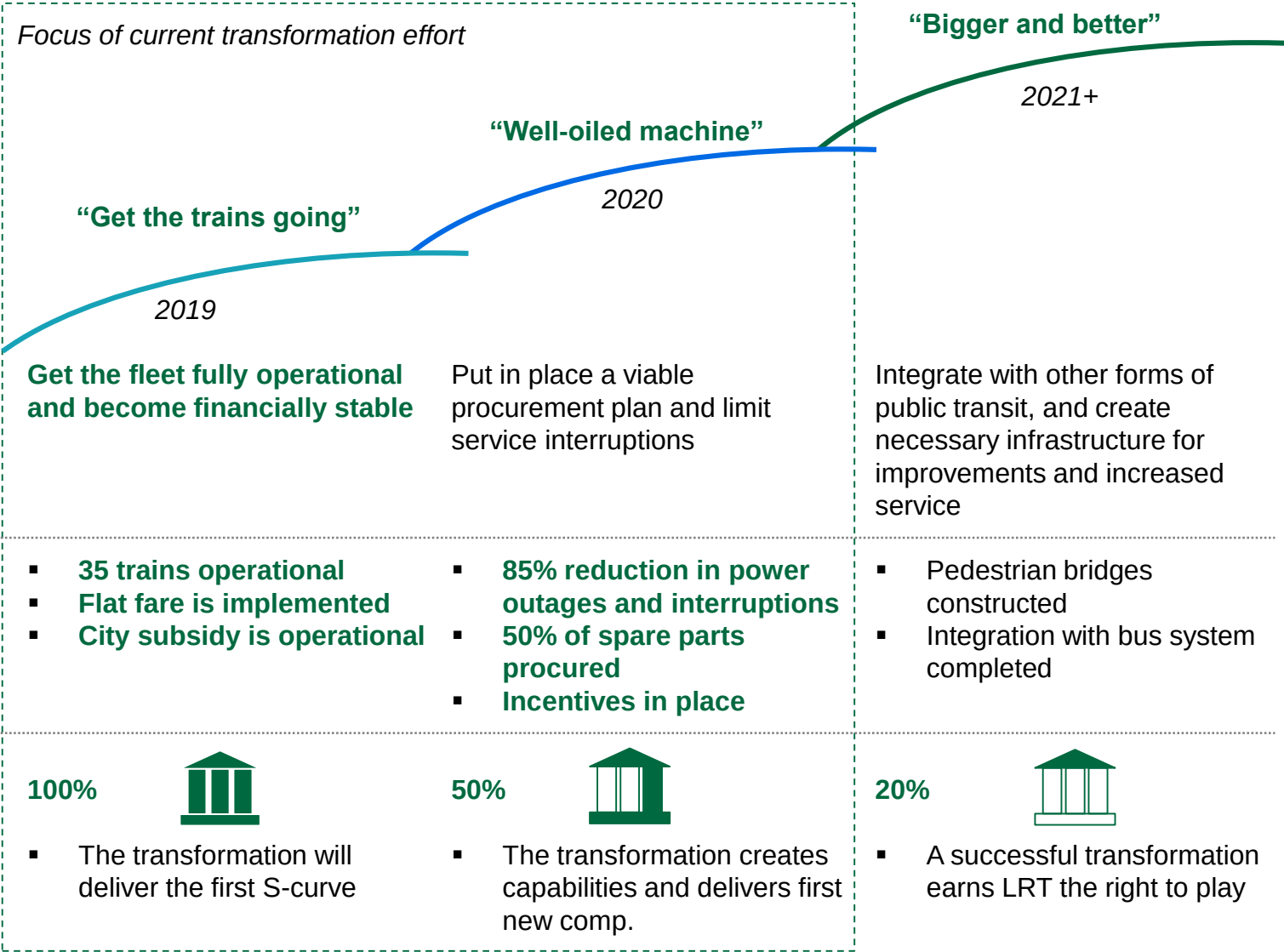
- ERC has been in discussions with EEU and EEP for the past year but the parties have yet to agree on a solution



The LRT transformation is grounded in three key areas



The transformation is focused on immediate needs but gets IPDC ready for the next decade



Each pillar is backed by a set of initiatives

Net one-time impact
Net recurring impact



Value driver	What do we do	Why will it work	Impact (net recurring and one-time), ETB mn
Financial Operations	2 Improve ticketing controls by training inspection agents and linking incentive to fines levied	- City subsidy discussions are already under way, and as LRT provides a critical urban service for Addis Ababa, it is in the City's best interests to provide the subsidy - Flat fare works in many other urban rails as a simple and higher revenue-generating ticketing system - Ticketing controls have to be put in place as the estimated fare evasion is quite high across LRT passengers	0 127
	3 Identify and put in place a flat fare based on estimated costs, subject to revision every two years		
	5 Measure true operating costs and forecasted deficit, and negotiate with City to cover deficit, agree on KPIs to measure, and determine subsidy mechanism		
Technical Operations	1 Reduce power outages on the LRT network through equipment upgrade, procuring secondary equipment, and better coordination with the utility company	- With the sunseting of the management contractor, the contractor is to provide many of the technical handovers and repairs that are essential to these initiatives - Sending repairs, maintenance, and procurement requests to China is unsustainable in the long term, so identifying local / regional players is greatly important - Security and continued service will be a main priority for LRT, ERC, and MOT as per the 100 day plan	105 96
	4 Identify plan for procuring spare parts to reduce lead times and dependence on foreign suppliers to improve the maintenance for the rolling stock		
	7 Reduce main line incidents through upgraded security equipment and processes on main line and depots		
Enablers	6 Link incentives and compensation with job performance as measured against KPIs tracking to LRT's overall strategic objectives	- LRT employees themselves have noted that they do not feel rewarded for performance - Linking performance and compensation incentives is the bedrock of a strong performing organization and LRT should lead the way in that	

LRT Initiatives

Initiatives	Feasibility			Impact				Capability Building	Comments
	Cost	Regulatory Change	Human Resources	Opex	Capex	Revenue	Volume		
L1 Reduce power outages on the LRT network through equipment upgrade, procuring secondary equipment, and better coordination with the utility company	✓		✓	✓	✓	✓	✓		Negotiating with power utility to align protection levels to prevent future damage to cables and half day train outages + refunds
L2 Improve ticketing controls by training inspection agents and linking incentive to fines levied			✓			✓	✓	✓	Currently ticketing inspection agents only catch ~30 cases of ticketless passengers each day, but likely much more prevalent
L3 Identify and put in place a flat fare based on estimated costs, subject to revision every two years		✓				✓	✓		Since over half of tickets sold are sold in the lowest pricing tier, there is likely some fraud that can be solved with a flat fare
L4 Identify plan for procuring spare parts to reduce lead times and dependence on foreign suppliers to improve the maintenance for the rolling stock	✓		✓	✓	✓	✓	✓		More than half the fleet is currently inoperational due to lack of maintenance and necessary parts procurement
L5 Measure true operating costs and forecasted deficit, and negotiate with City to cover deficit, agree on KPIs to measure, and determine subsidy mechanism	✓	✓	✓			✓		✓	Proposal to City is already out, but they will need the specific KPIs that LRT can measure and provide appropriate incentives
L6 Link incentives and compensation with job performance as measured against KPIs tracking to LRT's overall strategic objectives	✓		✓					✓	LRT employees feel that they are not compensated at the right level and that incentives are not linked to performance
L7 Reduce main line incidents through upgraded security equipment and processes on main line and depots	✓	✓		✓	✓			✓	Breaches of safety and security damage equipment, delay trains, and cost LRT money

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