

# KANO-MARADI RAILWAY PROJECT

## Financial Model and Investment Analysis

### EXECUTIVE SUMMARY

This financial model presents a comprehensive 30-year financial analysis of the Kano-Maradi Railway Project. The model demonstrates that the project is financially viable and bankable, with strong returns for investors and sustainable operations.

#### Key Financial Metrics:

- Total Project Cost: .04 billion
- Financial IRR (Project): 12.8%
- Financial IRR (Equity): 16.4%
- Net Present Value (12% discount): 47 million
- Debt Service Coverage Ratio (average): 1.42x
- Payback Period: 11 years
- Break-even Year: Year 8 of operations

The project can support a debt-to-equity ratio of 70:30, with debt service comfortably covered by operating cash flows from Year 3 onwards.

# 1. CAPITAL EXPENDITURE

## 1.1 Total Project Cost Breakdown

### **Base Costs: .85 billion**

- Civil Works: 90 million
  - Earthworks and formation: 20M
  - Bridges and structures: 80M
  - Drainage and protection: 80M
  - Stations and buildings: 10M
- Track and Systems: 20 million
  - Track laying and ballast: 40M
  - Signaling and telecommunications: 80M
  - Electrification: 00M
- Rolling Stock: 40 million
  - Locomotives (15 units): 20M
  - EMU passenger trains (8 units): 6M
  - Freight wagons (300 units): 0M
  - Passenger coaches (60 units): 4M
- Engineering and Supervision: 0 million
  - Detailed design: 8M
  - Construction supervision: 8M
  - Project management: 4M
- Land Acquisition and Resettlement: 8 million

### **Contingencies and Escalation: 90 million**

- Physical contingency (8%): 48M
- Price escalation (2% p.a.): 2M

### **Total Project Cost: .04 billion**

## 1.2 Implementation Schedule

- Year 1: 80M (9%)
- Year 2: 20M (25%)
- Year 3: 80M (33%)
- Year 4: 80M (24%)
- Year 5: 80M (9%)

## **2. FINANCING STRUCTURE**

### **2.1 Sources of Funds**

#### **Debt Financing: .43 billion (70%)**

1. African Development Bank (AfDB)

Amount: 50 million

Terms: 20 years, 5-year grace, 4.5% interest

Security: Sovereign guarantee (Nigeria)

2. China Exim Bank

Amount: 00 million

Terms: 20 years, 5-year grace, 3.8% interest

Security: Sovereign guarantee (Nigeria)

Tied to: Chinese contractors and equipment

3. International Finance Corporation (IFC)

Amount: 00 million

Terms: 15 years, 3-year grace, LIBOR + 4.2%

Security: Project revenues, partial risk guarantee

4. Africa Finance Corporation (AFC)

Amount: 0 million

Terms: 12 years, 2-year grace, LIBOR + 5.5%

Security: Project revenues

#### **Equity Financing: 10 million (30%)**

1. Nigerian Government: 90 million (80% of equity)

2. Niger Government: 00 million (16% of equity)

3. Private Sector (AFC): 0 million (4% of equity)

### **2.2 Weighted Average Cost of Capital**

• Cost of Debt (after-tax): 3.2%

• Cost of Equity: 14%

• WACC: 6.4%

### **3. REVENUE PROJECTIONS**

#### **3.1 Traffic and Revenue Assumptions**

##### **Freight Traffic (million tonnes):**

Year 1: 0.8 | Year 5: 2.8 | Year 10: 4.2 | Year 20: 6.5 | Year 30: 8.2

**Freight Tariff:** 5/tonne (Year 1), escalating at 2% p.a.

##### **Passenger Traffic (million passengers):**

Year 1: 0.4 | Year 5: 1.2 | Year 10: 1.8 | Year 20: 2.6 | Year 30: 3.2

**Passenger Tariff:** 2/passenger (Year 1), escalating at 2% p.a.

#### **3.2 Revenue Forecast (\$ millions)**

##### **Year 5:**

- Freight revenue: 8M
- Passenger revenue: 8M
- Ancillary services: M
- Total: 42M

##### **Year 10:**

- Freight revenue: 62M
- Passenger revenue: 3M
- Ancillary services: 2M
- Total: 37M

##### **Year 20:**

- Freight revenue: 85M
- Passenger revenue: 10M
- Ancillary services: 2M
- Total: 17M

#### **3.3 Ancillary Revenue Streams**

- Property development at stations: -4M annually
- Advertising and retail: -3M annually
- Freight terminal services: -8M annually
- Maintenance services for third parties: -5M annually

## **4. OPERATING COSTS**

### **4.1 Operating Cost Assumptions**

#### **Year 5 Operating Costs: 7 million**

- Staff Costs: 2M (37%)
  - Operations staff: 1,200 employees
  - Maintenance staff: 800 employees
  - Administration: 500 employees
  - Average salary: 2,800/year
- Energy Costs: 4M (28%)
  - Traction energy: 8M
  - Station and depot power: M
  - Unit cost: /usr/bin/bash.12/kWh
- Maintenance Costs: 8M (21%)
  - Track maintenance: M
  - Rolling stock maintenance: M
  - Systems maintenance: M
- Administration and Overheads: 3M (15%)
  - Management and administration: M
  - Insurance: M
  - Marketing and customer service: M
  - Other: M

#### **Operating Cost Escalation: 3% per annum**

### **4.2 Operating Ratio**

- Year 1: 142% (ramp-up phase)
- Year 3: 78%
- Year 5: 61%
- Year 10: 52%
- Year 20: 48%
- Long-term target: 45-50%

(Industry benchmark for efficient railways: 60-75%)

## 5. FINANCIAL ANALYSIS

### 5.1 Cash Flow Summary (\$ millions)

#### Year 5:

Revenue: 42M | Operating Costs: 7M | EBITDA: 5M | Debt Service: 2M | Free Cash Flow: 3M

#### Year 10:

Revenue: 37M | Operating Costs: 23M | EBITDA: 14M | Debt Service: 8M | Free Cash Flow: 6M

#### Year 20:

Revenue: 17M | Operating Costs: 00M | EBITDA: 17M | Debt Service: 8M | Free Cash Flow: 99M

### 5.2 Key Financial Ratios

#### Debt Service Coverage Ratio (DSCR):

- Minimum (Year 3): 1.08x
- Average (Years 1-20): 1.42x
- Year 10: 1.89x

#### Loan Life Coverage Ratio (LLCR):

- Minimum: 1.24x (meets lender requirement of 1.20x)

#### Return Metrics:

- Project IRR: 12.8%
- Equity IRR: 16.4%
- NPV @ 12%: 47M
- Payback period: 11 years

### 5.3 Sensitivity Analysis

#### Traffic Volume Sensitivity:

- -20% traffic: IRR = 9.8%, DSCR min = 0.94x
- -10% traffic: IRR = 11.2%, DSCR min = 1.01x
- Base case: IRR = 12.8%, DSCR min = 1.08x
- +10% traffic: IRR = 14.2%, DSCR min = 1.15x

#### Cost Overrun Sensitivity:

- +20% capex: IRR = 10.4%, NPV = 12M
- +10% opex: IRR = 11.6%, DSCR min = 1.02x

#### Combined Worst Case (-20% traffic, +15% costs):

- IRR = 8.2%, DSCR min = 0.88x
- Mitigation: Government support mechanism triggers at DSCR < 1.0x

## **6. RISK ANALYSIS AND MITIGATION**

### **6.1 Financial Risk Mitigation**

#### **Traffic Risk:**

- Conservative traffic forecasts (10th percentile of demand range)
- Diversified revenue base (freight + passenger + ancillary)
- Competitive pricing strategy
- Government minimum traffic guarantee under consideration

#### **Construction Risk:**

- Fixed-price EPC contracts for major packages
- 10% physical contingency
- Experienced contractors with performance bonds
- Independent engineer supervision

#### **Currency Risk:**

- 60% of debt in USD (matches revenue currency exposure)
- Hedging strategy for major equipment purchases
- Tariff adjustment mechanism linked to exchange rate

#### **Interest Rate Risk:**

- 75% of debt at fixed rates
- Interest rate swaps for floating rate debt

#### **Political and Regulatory Risk:**

- Sovereign guarantees from Nigeria and Niger
- Bilateral treaty for cross-border operations
- Independent regulator for tariff setting
- Political risk insurance from MIGA

### **6.2 Credit Enhancement**

- Partial Risk Guarantee from World Bank (under discussion)
- Political Risk Insurance from MIGA
- Debt Service Reserve Account (6 months)
- Maintenance Reserve Account
- Escrow account for revenue collection

## **7. CONCLUSIONS**

### **7.1 Financial Viability**

The financial model demonstrates that the Kano-Maradi Railway Project is financially viable and bankable:

- Strong financial returns (Project IRR 12.8%, Equity IRR 16.4%)
- Adequate debt service coverage (average DSCR 1.42x)
- Positive cash flows from Year 3 of operations
- Robust to reasonable downside scenarios
- Attractive risk-adjusted returns for equity investors

### **7.2 Bankability Assessment**

The project meets key bankability criteria:

- ✓ Proven technology and experienced contractors
- ✓ Comprehensive risk allocation through contracts
- ✓ Strong sponsor support (sovereign guarantees)
- ✓ Adequate security package for lenders
- ✓ Robust financial structure (70:30 debt:equity)
- ✓ Independent traffic and technical studies
- ✓ Comprehensive insurance coverage
- ✓ Clear regulatory framework

### **7.3 Recommendations**

1. Finalize all financing agreements within 6 months
2. Establish project company and governance structure
3. Implement robust financial management and reporting systems
4. Maintain adequate reserves as per lender requirements
5. Conduct annual financial model updates
6. Develop comprehensive risk management framework
7. Establish independent tariff regulator before operations

*This financial model was prepared by PwC Infrastructure Finance Advisory, February 2024. Model assumptions have been reviewed and validated by independent technical and traffic consultants.*