

KANO-MARADI RAILWAY PROJECT

Feasibility Study Report

EXECUTIVE SUMMARY

The Kano-Maradi Railway Project represents a transformative infrastructure initiative connecting Nigeria and Niger Republic through a 283.75-kilometer standard gauge railway line. This feasibility study, commissioned by the African Development Bank (AfDB) and conducted by a consortium of international engineering firms, confirms the technical, economic, and financial viability of the project.

Project Overview:

The railway will connect Kano (Nigeria) through Jigawa and Katsina states to Maradi (Niger Republic), establishing the first cross-border rail link in West Africa in over 70 years. The project aligns with ECOWAS regional integration objectives and Nigeria's Railway Modernization Programme.

Key Findings:

- Economic Internal Rate of Return (EIRR): 18.2%
- Financial Internal Rate of Return (FIRR): 12.8%
- Net Present Value (NPV): 47 million (at 12% discount rate)
- Benefit-Cost Ratio: 2.34
- Payback Period: 11 years
- Estimated annual freight volume: 2.8 million tonnes by Year 5
- Estimated annual passenger traffic: 1.2 million by Year 5

The study concludes that the project is economically viable, financially sustainable, and strategically critical for regional development.

1. TECHNICAL ASSESSMENT

1.1 Route Alignment

The proposed route follows the existing road corridor from Kano to Maradi, minimizing land acquisition requirements. Key technical specifications include:

- Track gauge: 1,435mm (standard gauge)
- Design speed: 120 km/h (freight), 160 km/h (passenger)
- Axle load: 25 tonnes
- Minimum curve radius: 800 meters
- Maximum gradient: 1.5%
- Electrification: Dual voltage (25kV AC overhead)

1.2 Infrastructure Components

The project includes construction of:

- 283.75 km of new standard gauge track
- 12 passenger stations (6 in Nigeria, 6 in Niger)
- 4 freight terminals with modern cargo handling facilities
- 1 locomotive maintenance depot in Kano
- 1 rolling stock maintenance facility in Maradi
- 47 bridges and 23 culverts
- Modern signaling and telecommunications systems
- Border crossing facility at Jibia-Magama Jibia

1.3 Rolling Stock Requirements

Initial fleet composition:

- 15 diesel-electric locomotives (3,000 HP)
- 8 electric multiple units (EMU) for passenger service
- 300 freight wagons (various types)
- 60 passenger coaches

2. ECONOMIC ANALYSIS

2.1 Demand Forecast

Traffic projections are based on comprehensive origin-destination surveys, trade flow analysis, and econometric modeling:

Freight Traffic Projections (million tonnes):

Year 1: 0.8 | Year 3: 1.9 | Year 5: 2.8 | Year 10: 4.2 | Year 20: 6.5

Passenger Traffic Projections (million passengers):

Year 1: 0.4 | Year 3: 0.9 | Year 5: 1.2 | Year 10: 1.8 | Year 20: 2.6

2.2 Economic Benefits

The project generates substantial economic benefits:

- Transport cost savings: 56 million annually (Year 5)
- Time savings: 2 million annually
- Reduced road maintenance costs: 8 million annually
- Accident cost reduction: 2 million annually
- Environmental benefits (CO2 reduction): million annually
- Employment creation: 12,000 jobs during construction, 2,500 permanent jobs
- Regional trade facilitation: Estimated 35% increase in Nigeria-Niger trade

2.3 Sensitivity Analysis

The project remains economically viable under various scenarios:

- 20% reduction in traffic: EIRR = 14.6%
- 15% cost overrun: EIRR = 15.8%
- Combined worst case: EIRR = 12.1%

3. FINANCIAL ANALYSIS

3.1 Capital Costs

Total project cost: .04 billion (2024 prices)

Cost Breakdown:

- Civil works: 80 million (48%)
- Track and signaling: 20 million (25%)
- Rolling stock: 40 million (17%)
- Stations and terminals: 20 million (6%)
- Engineering and supervision: 0 million (4%)

3.2 Operating Costs

Annual operating costs (Year 5): 7 million

- Staff costs: 2 million
- Energy: 4 million
- Maintenance: 8 million
- Administration: 3 million

3.3 Revenue Projections

Annual revenue (Year 5): 42 million

- Freight revenue: 8 million (69%)
- Passenger revenue: 8 million (27%)
- Ancillary services: million (4%)

Operating ratio (Year 5): 61% (industry benchmark: 75%)

3.4 Financing Plan

- AfDB loan: 50 million (17%)
- China Exim Bank: 00 million (39%)
- IFC: 00 million (10%)
- Nigerian Government: 90 million (24%)
- Niger Government: 00 million (5%)
- Private sector (AFC): 00 million (5%)

4. RISK ASSESSMENT AND MITIGATION

4.1 Key Risks Identified

Construction Risks:

- Geological challenges in certain sections
- Potential delays in land acquisition
- Security concerns in border areas

Mitigation: Comprehensive geotechnical surveys completed; land acquisition process initiated; security cooperation agreement between Nigeria and Niger signed.

Financial Risks:

- Currency fluctuation
- Interest rate volatility
- Cost escalation

Mitigation: Hedging strategies; fixed-rate financing for 70% of debt; 10% contingency provision.

Operational Risks:

- Lower than projected traffic
- Competition from road transport
- Cross-border operational challenges

Mitigation: Conservative traffic forecasts; competitive pricing strategy; joint Nigeria-Niger railway authority established.

4.2 Environmental and Social Risks

Addressed through comprehensive ESIA (see separate document) and Resettlement Action Plan (RAP).

5. CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

The Kano-Maradi Railway Project is technically feasible, economically viable, and financially sustainable. The project will:

- Significantly reduce transport costs for landlocked Niger
- Enhance regional trade and economic integration
- Create substantial employment opportunities
- Contribute to climate change mitigation through modal shift
- Strengthen Nigeria-Niger bilateral relations

5.2 Recommendations

1. Proceed with detailed engineering design immediately
2. Finalize all financing agreements within 6 months
3. Complete land acquisition and resettlement before construction start
4. Establish joint Nigeria-Niger Railway Operating Company
5. Develop comprehensive training program for operations staff
6. Implement robust project management and monitoring framework
7. Conduct regular stakeholder consultations throughout implementation

5.3 Implementation Timeline

- Detailed design: 12 months
- Procurement: 8 months
- Construction: 48 months
- Testing and commissioning: 6 months
- Total project duration: 74 months (6.2 years)

Expected commercial operation: Q2 2026

This feasibility study was prepared by AECOM-SYSTRA Consortium for the African Development Bank, December 2023.