Maximizing Value in the Rail Industry with Strategic Cost Management
Rail executives view reducing operating costs as crucial for meeting strategic goals.

Priorities for meeting performance and growth objectives during the next five years:

- **Operating costs**: 75% ranked as first priority, 13% as second priority, 12% as third priority. 88% of executives ranked operating costs as a near-term first or second priority.
- **Revenue management**: 50% as first priority.
- **Digital sales platform**: 13% as first priority, 25% as second priority.
- **Fleet procurement**: 38% as first priority.
- **Talent**: 13% as first priority.
- **Sustainability**: 13% as first priority.

Source: BCG interviews with rail industry executives.
Includes punctuality.
Cost competition is intensifying in the rail industry

**Rail companies compete to capture share in regions with strong demand and alternative transport modes**
Freight rail customers often have connections to competing railroads—some can also build a new rail line to a competing railroad.¹

The rail industry competes with multiple transport modes, including road and air
Traveling by train is on average twice as expensive as by plane in Europe, with some rail routes costing up to 30 times as much as corresponding flights.²

**Rail companies and agencies face greater scrutiny concerning the allocation of government funding and subsidies**
As infusions of recovery cash become more common, so does scrutiny of agency spending. It is critical for agencies to have a purposeful business strategy and operating model in place.³

Rail incumbents see increased competition from privatized companies as rail markets liberalize
Rail competition becomes more intense in Europe with new operators and new lines, e.g., FlixTrain in Germany, Westbahn in Austria, Italo in Italy, Ouigo in Spain, MTRX in Sweden.

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The cost focus persists despite tailwinds that are promoting growth and innovation in the rail industry

Greater awareness of the sustainability imperative creates the need for more lower-carbon rail capacity

Changes in mobility behavior owing to urbanization and high road-transport costs decrease reliance on vehicles

New forms of mobility present opportunities for integrating rail into urban first- and last-mile transport

Digitization optimizes processes in the short term and transforms operations over the long term

Regulatory pressure to decarbonize the rail value chain improves competitiveness versus road transport

Source: BCG.
The total shareholder return metric helps rail companies understand the value of cost excellence and margin growth.

**Total shareholder return**
- Measures the change in value over time
- Is easily observable for publicly listed companies
- Can be broken down into fundamental drivers
- Allows companies to derive blueprints for value creation in a specific industry on the basis of what investors have most rewarded

Source: BCG analysis.

Note: ROCE = return on capital employed; EBIT = earnings before interest and taxes; EBITDA = earnings before interest, taxes, depreciation, and amortization.
Publicly listed rail operators and infrastructure companies generated below-average TSR in recent years

Sources: S&P Capital IQ; Refinitiv; BCG Value Creators database 2023; and BCG ValueScience Center.
Note: Median TSR per respective industry sample; n = 2,449; companies that are headquartered in Russia or have predominantly Russian operations were omitted because stock trading was suspended and share prices have collapsed following Russia’s invasion of Ukraine. Turkish companies were not included because the country’s hyperinflationary environment skews valuations.
Rail companies that maintained high margins typically generated higher TSR.

Margin growth, a TSR driver with clearly defined levers, is associated with higher TSR.

TSR drivers

- Capital gains
- Profit growth
- Multiple change
- Dividends
- Sales growth
- Margin growth
- Cash flow contribution
- Share change
- Net debt and leverage effect

EBITDA margin growth correlates with higher TSR

ANNUALIZED TSR, OCT 31, 2018–OCT 31, 2023 (%)

The only driver with clearly defined levers to apply. Other drivers are limited by capacity constraints, market conditions, or high capital needs.

Sources: S&P Capital IQ; BCG ValueScience Center.
Note: The background curve is the S&P Global 100, based on data ending in October 2023. TSRs use company reporting currency.
## Variations in value creation reflect the unique circumstances in each region

<table>
<thead>
<tr>
<th></th>
<th>North America</th>
<th>Latin America</th>
<th>Europe, Middle East, and Africa</th>
<th>Asia-Pacific</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Passenger</strong></td>
<td>Companies and agencies typically operate at a loss and receive government subsidies</td>
<td>Brazil, Argentina, and Mexico are leaders in innovation, such as contactless ticketing</td>
<td>Privatization is driving margin competition, and passenger rail is prioritized over freight on tracks</td>
<td>Countries are pioneers in high-speed rail and leaders in metro service, while pursuing efficiencies of diverse land use in markets such as Japan</td>
</tr>
<tr>
<td><strong>Freight</strong></td>
<td>An expansive network moves ~40% of long distance freight volume, while deregulation led to price competition and higher volumes</td>
<td>Brazil, Mexico, Colombia, Chile, Argentina, and Bolivia are key operators and seek to expand utilization</td>
<td>Operators aim to increase modal share but are challenged by cross-border inconsistencies and a lack of standards</td>
<td>The moderately concentrated market has five major players, with China leading in railway coverage</td>
</tr>
<tr>
<td><strong>Infrastructure</strong></td>
<td>The market is monopolistic, deprioritizes passenger traffic, has high prices, and lacks open access</td>
<td>Networks are investing in connectivity and focusing on sustainability</td>
<td>Networks benefit from EU funding for cross-border connections and sustainability investments</td>
<td>Networks benefit from cross-border investments to increase connectivity, as well as Chinese-built infrastructure projects</td>
</tr>
</tbody>
</table>

**Historic value creation:**

- **Low**
- **High**

*Source: BCG research and analysis.*
Benchmarking line items reveals stark variations in performance by industry segment (1/2)

<table>
<thead>
<tr>
<th></th>
<th>Passenger $ per passenger-kilometer per year</th>
<th>Freight $ per ton-kilometer per year</th>
<th>Infrastructure $ per track-kilometer per year</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.0</td>
<td>0.2</td>
<td>0.4</td>
</tr>
<tr>
<td>Maintenance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Planned</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unplanned</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Infrastructure</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Track fees</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Station fees</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Terminal and port fees</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parking fees</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Energy/fuel</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Personnel(^1)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Driver</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conductor</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Catering</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Provisioning</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**THE CHALLENGES AND IMPROVEMENT LEVERS**

- **Passenger Costs:**
  - Maintenance:
    - Planned & Unplanned
  - Infrastructure:
    - Many metros own infrastructure, thereby avoiding fees
  - Energy/fuel:
    - Personnel costs are higher for metro and commuter rails

**Sources:** Annual reports; expert interviews; BCG analysis.

\(^1\)For infrastructure, personnel costs include those for traffic, train control, and security; they are not itemized here.
**The Challenges and Improvement Levers**

Benchmarking line items reveals stark variations in performance by industry segment (2/2)

### Sources:
- Annual reports;
- Expert interviews;
- BCG analysis.

### Capital intensity of infrastructure adds to high depreciation costs

<table>
<thead>
<tr>
<th></th>
<th>Passenger per passenger-kilometer per year</th>
<th>Freight per ton-kilometer per year</th>
<th>Infrastructure per track-kilometer per year</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.0</td>
<td>0.000</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>0.2</td>
<td>0.005</td>
<td>50,000</td>
</tr>
<tr>
<td></td>
<td>0.4</td>
<td>0.010</td>
<td>100,000</td>
</tr>
<tr>
<td></td>
<td>0.6</td>
<td>0.015</td>
<td>150,000</td>
</tr>
</tbody>
</table>

- Inspector
- Shunter
- Security
- Depreciation
- Overhead
- Sales
- Marketing
- IT
- HR
- Finance
- Other
- Commissioning
- Outsourced
- Other material

**Notes:**
- Median
- Company

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*Sources: Annual reports; expert interviews; BCG analysis.*


**THE CHALLENGES AND IMPROVEMENT LEVERS**

**Discussions with operator and infrastructure experts highlight key challenges**

<table>
<thead>
<tr>
<th><strong>The challenge</strong></th>
<th><strong>OPERATING</strong></th>
<th><strong>CAPITAL</strong></th>
<th><strong>PLANNING</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Inflexible labor costs</td>
<td>SG&amp;A inefficiencies</td>
<td>Time-based maintenance</td>
<td>High-cost assets</td>
</tr>
<tr>
<td>Direct labor costs are typically inflexible owing to regulations and union dynamics</td>
<td>There are many manual processes in core support functions, e.g., HR, finance, IT, procurement</td>
<td>The industry is moving from time-based to predictive maintenance, requiring high investments</td>
<td>Over 40% of assets have high fixed costs, requiring maximum productivity to remain cost-effective</td>
</tr>
<tr>
<td>SG&amp;A inefficiencies</td>
<td></td>
<td></td>
<td>Required upgrades and investments in digitized assets and sustainability are costly</td>
</tr>
<tr>
<td>Time-based maintenance</td>
<td></td>
<td></td>
<td>Different rail ownership models and limited capacity often disrupt traffic flows</td>
</tr>
<tr>
<td>High-cost assets</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Long-term investments</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Limited network capacity</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**IMPERATIVES FOR…**

**Operators**

Automate core train-operating functions across the value chain and customer touch points

Identify efficiency opportunities in overhead, especially in operations and revenue management

Apply fleet data to define an asset management strategy; evolve to predictive maintenance

Ensure that rolling stock assets operate at maximum mileage and efficiency to minimize fleet size

Apply a TCO approach to procurement, coupled with clear investing requirements

Coordinate with infrastructure companies on timetabling, particularly when the operator does not own the network

**Infrastructure companies**

Leverage technology to automate planning, dispatching, and signaling operations

Seek efficiency opportunities in overhead, focused on operations and sales

Translate track data to a maintenance and asset management strategy; evolve to predictive maintenance

Develop on existing land and commercialize real estate for multiuse purposes

Achieve procurement excellence and keep up with rail modernization, e.g., ETCS3 and DAC

Manage capacity planning, dispatching, and signaling with digitized, customer-centric processes

**Overall system**

Maintain safety protocols and optimize digital end-to-end processes, e.g., procure to pay and order to cash

Improve integrated platforms to resolve administrative friction points between operators and infrastructure companies

Enable large-scale maintenance by coordinating across the system to minimize service delays

Minimize disruptions to improve punctuality and productivity; variabilize fixed costs

Centralize digitization efforts and investments to increase benefits across the system

Develop a one-stop-shop exchange between operators and infrastructure companies, including multimodal activity

**Source:** BCG analysis.

**Note:** ETCS3 = European Train Control System 3; DAC = digital automatic coupling; SG&A = sales, general, and administrative; TCO = total cost of ownership.
## THE CHALLENGES AND IMPROVEMENT LEVERS

Cost reduction levers address challenges for rail operators and infrastructure.

<table>
<thead>
<tr>
<th>The challenge</th>
<th>Inflexible labor costs</th>
<th>SG&amp;A inefficiencies</th>
<th>Time-based maintenance</th>
<th>High-cost assets</th>
<th>Energy and fuel</th>
<th>Depreciation</th>
<th>Capex</th>
<th>Long-term investments</th>
<th>Limited network capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Potential savings</strong></td>
<td>Personnel</td>
<td>Overhead</td>
<td>Maintenance</td>
<td>Capex and maintenance</td>
<td>Energy and fuel</td>
<td>Depreciation</td>
<td>Capex</td>
<td>~30%</td>
<td>~30%</td>
</tr>
<tr>
<td><strong>Levers</strong></td>
<td>Labor productivity</td>
<td>Automation and technology</td>
<td>Condition-based maintenance</td>
<td>Asset productivity</td>
<td>Energy and fuel management</td>
<td>Procurement excellence</td>
<td>Stronger planning and operational integration</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Exemplary initiatives used by leading companies</strong></td>
<td>Introduce stationary cameras to decrease visual inspections</td>
<td>Optimize overhead processes, e.g., procure to pay</td>
<td>Enable early refurbishment strategy</td>
<td>Optimize fluidity of traffic to improve punctuality</td>
<td>Implement driver-training program and DAS for better fuel handling</td>
<td>Apply a TCO approach to procurement process and use SCM tools</td>
<td>Plan disruptions to fit operators’ proposed schedules</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Reduce downtime by implementing lean methodology</td>
<td>Automate sales and ticketing via digital solutions</td>
<td>Develop health scores for each individual asset</td>
<td>Use surplus asset sales or leasing for locomotives/railcars</td>
<td>Reuse braking energy to reduce overall consumption</td>
<td>Conduct prebid meetings ahead of submissions</td>
<td>Integrate TMS with intermodal first- and last-mile data</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Design passenger rail facilities for efficient cleaning</td>
<td>Digitize end-to-end value chain with transport management systems</td>
<td>Make use of sensors to identify unknown wear and tear</td>
<td>Rightsize the fleet to minimize asset idle time</td>
<td>Utilize trains with fuel-efficient speed optimization</td>
<td>Leverage 3D printing to optimize spares inventory</td>
<td>Create capacity-optimized timetables</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: BCG analysis.

Note: DAS = driver advisory system; SCM = supply chain management; SG&A = sales, general, and administrative; TCO = total cost of ownership; TMS = train management system.

*Not additive across cost categories.*
A clean-sheet approach improves TCO efficiency by 10 to 15 percentage points compared with the current industry median.

### THE CHALLENGES AND IMPROVEMENT LEVERS

**EXAMPLE COST CATEGORY**

<table>
<thead>
<tr>
<th>COST CATEGORY</th>
<th>AS % OF TCO</th>
<th>POTENTIAL COST SAVINGS (%)</th>
<th>POSSIBLE LEVERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personnel</td>
<td></td>
<td>~10 ppt</td>
<td>Automate ticketing using a digital solution</td>
</tr>
<tr>
<td>Overhead</td>
<td></td>
<td>~15 ppt</td>
<td>Integrate purchasing and accounts payable systems</td>
</tr>
<tr>
<td>Maintenance</td>
<td></td>
<td>~10–15 ppt</td>
<td>Create a database for spare parts forecasting and KPIs</td>
</tr>
<tr>
<td>Energy/fuel</td>
<td>~30</td>
<td>~10–12 ppt</td>
<td>Invest in a DAS and develop a program that provides drivers with incentives for fuel-efficient driving</td>
</tr>
<tr>
<td>Depreciation</td>
<td>~10–15</td>
<td>~5–10</td>
<td>Apply a TCO model to the procurement strategy</td>
</tr>
</tbody>
</table>

**COST CATEGORY**

- **Passenger**
- **Freight**
- **Infrastructure**

Source: BCG analysis.

**Note:**
- DAS = driver advisory system; TCO = total cost of ownership.