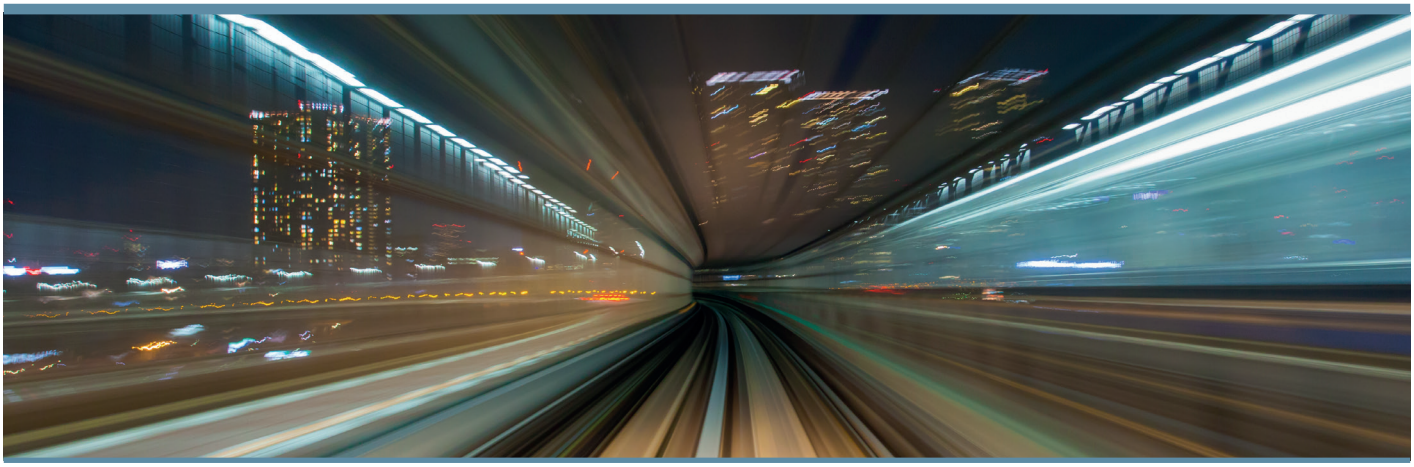

Executive Insights

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New Routes to Profitability in High-Speed Rail

Public railways are notoriously difficult to run profitably, and urban and suburban networks usually depend on government subsidies. High-speed rail (HSR) city pairs can be an exception.

Speed and convenience encourage travelers to choose HSR for journeys between cities, with many users such as business travelers prepared to pay premium prices. HSR lines connecting cities such as Florence-Rome, London-Manchester, Tokyo-Osaka and Madrid-Valencia have proved successful, achieving modal shares up to 65%.

Nevertheless, working out potential and profitability can be difficult. Studies have assessed HSR's share versus air travel, but assessing HSR's advantages over road options has been more difficult.

New research is changing that. In this *Executive Insights*, L.E.K. Consulting reveals the relationship between rail and road market share on city-to-city routes for the first time. We find that city pairs where HSR is successful share a set of characteristics, such as large populations and an optimal travel distance, as well as the right HSR offering and commercial policies. We also explain how railway operators, investors and public transport regulators can assess potential HSR city pairs and develop strategies to increase the profitability of existing services.

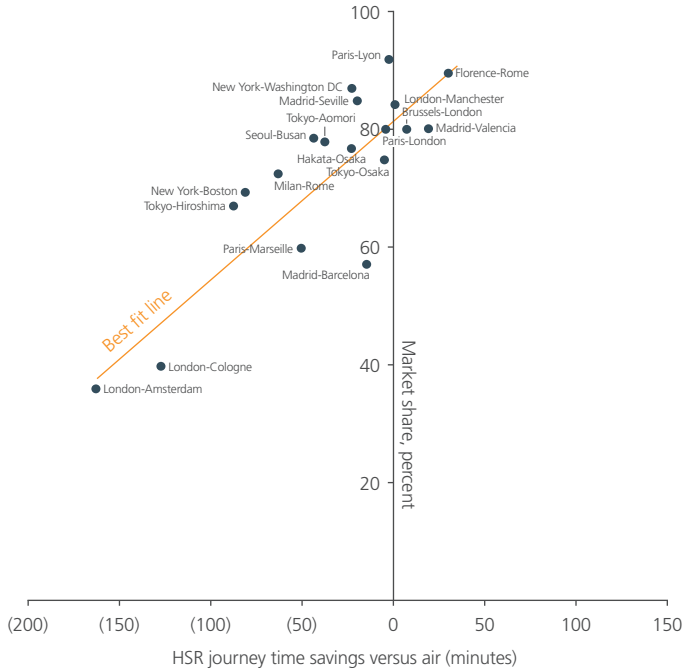
Understanding rail's market share

The battle between rail and air services for market share is well-understood in the transport industry, and research has shown how HSR can save time for city-to-city travelers and gain market share from air services. Rail travelers, for example, can board trains at stations close to population and economic centers and leave almost immediately; air travelers, by contrast, must usually travel to airports located outside the city center, undergo airline check-in procedures, and wait for boarding and departure.

Figure 1 shows rail's market share versus air by journey time difference. As more time is saved by rail travel, market share increases. **Routes such as Florence-Rome, London-Manchester and Tokyo-Osaka show a strong rail share based on time savings versus air.**

Figure 1

HSR modal share versus air by journey time difference[1]



[1]Assumes a one-hour difference in processing time when traveling by air. Journey time savings displayed for Acela Express services

Source: L.E.K. International Travel Surveys; L.E.K. analysis and research

New Routes to Profitability in High-Speed Rail was written by **Andrew Allum** and **John Goddard**, Partners, **Becrom Basu**, Director, **Stuart Robertson**, Manager, and **Arie Jamal**, Consultant. They are all based in London.

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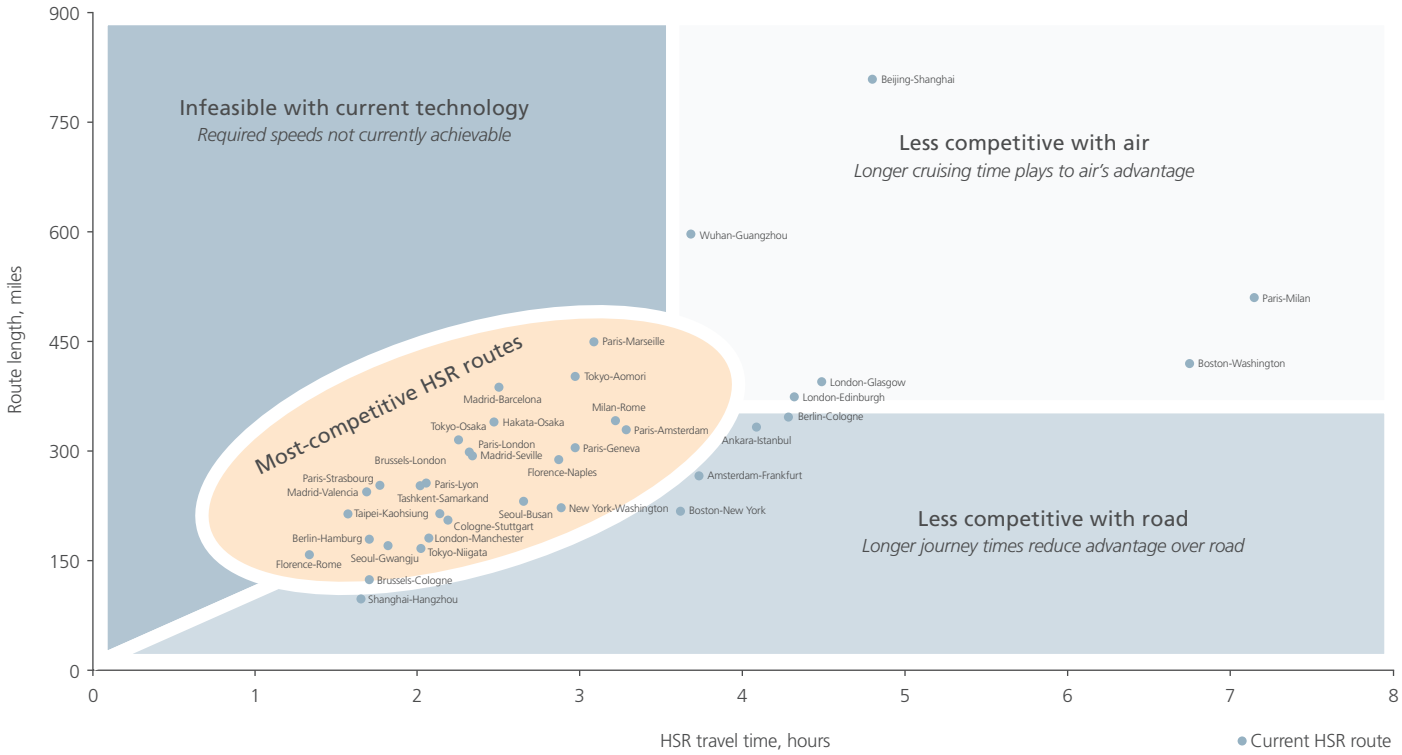
L.E.K.

Figure 2
HSR travel time and route length



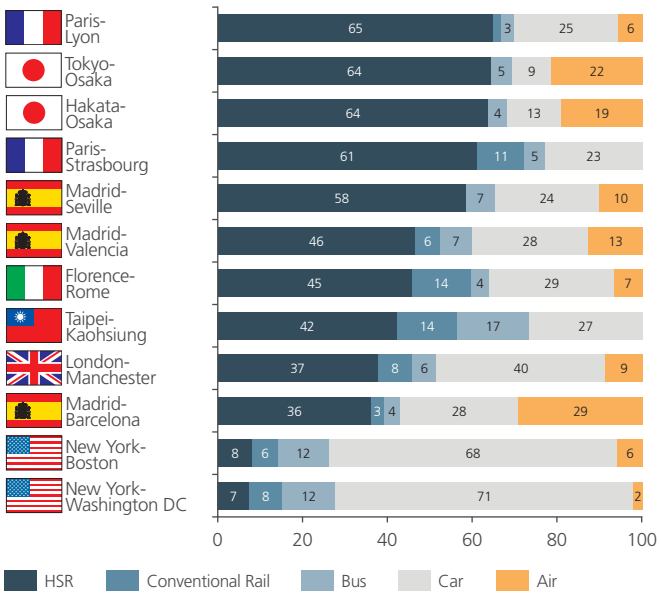
Source: L.E.K. analysis and research

But air is only part of the picture. Rail services also compete with road options, and travelers frequently choose the car when they believe it will save enough cost to justify the increased time versus rail or air. Analysis of HSR around the world according to route length and travel time demonstrates that the most competitive HSR city pairs lie in a "sweet spot" — marked in yellow in Figure 2. When routes fall outside that sweet spot, they are naturally less competitive compared with air or road.

Understanding HSR and road competition

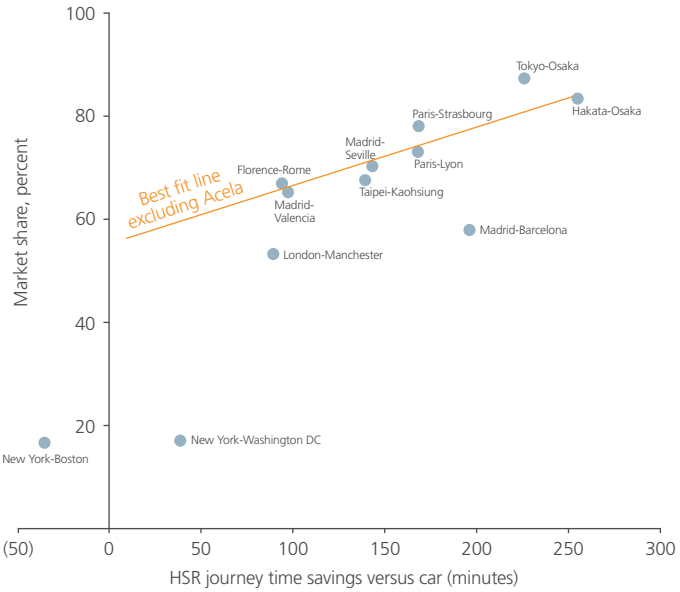
While many rail operators understand how their services compete with road, the transport industry as a whole lacks

Figure 3
Modal share by HSR route (2018)



Source: L.E.K. International Travel Surveys

Figure 4
HSR modal share against car by journey time difference



Source: L.E.K. International Travel Surveys; L.E.K. analysis and research

a view of the relationship between rail's modal share and time savings worldwide. To address this, L.E.K. has developed groundbreaking research into rail/road modal shares around the world and corroborated it with published data and discussions with HSR operators.

To our knowledge there are no previous publicly available studies that have looked at rail/road modal shares for HSR internationally.

Emerging data sources such as cellphone and GPS tracking present opportunities to analyze road travel in greater detail, with confidence and accuracy. But though these data sources can provide deep insights for individual markets, they are too expensive to be appropriate for an international overview of market share for HSR routes.

Therefore, L.E.K.'s research has used international travel surveys to get a comparative view of the rail/road modal share for 12 HSR routes, enabling us to establish market shares for all competing modes between major city pairs (see Figure 3).

As with rail/air, our research shows a clear relationship between rail/road market share and journey time savings (see Figure 4). The higher rail shares (for example Tokyo-Osaka) are achieved when journey time savings are higher, in this case around four hours.

Pricing and commercial strategy

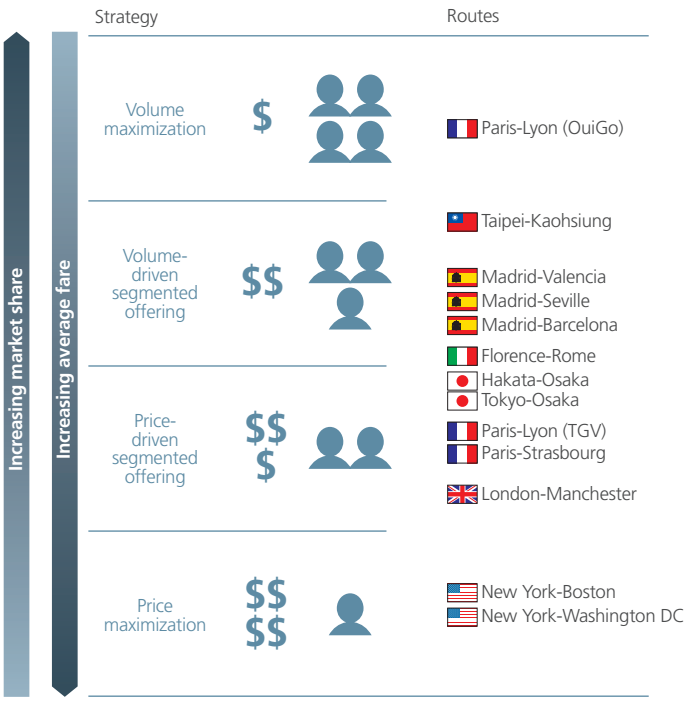
Rail's market share depends on both saving journey time over road, and on pricing. L.E.K. analysis observes four key strategies adopted by HSR operators internationally:

- **Volume maximization** — a low-cost service attracting a high volume of passengers, which seeks to enhance low margins with sales of ancillary services and products
- **Volume-driven segmented offering** — a multiclass, high-capacity service with an economy class that is priced to serve a large market
- **Price-driven segmented offering** — a premium, multiclass offering aimed primarily at time-sensitive travelers for both business and personal journeys
- **Price maximization** — a premium, low-capacity service at a high price point, focused on time-sensitive business travelers

An HSR operator's commercial strategy affects both market share and profitability, and the most profitable strategy depends on the exact circumstances. For instance, a route close to the sweet spot (beating both car and air in journey times) can charge certain time-sensitive segments a premium, winning share from air. Other routes will have different characteristics, meaning different options for the operator.

The HSR economics benefit from attracting sufficient volumes of more price-sensitive segments off-peak or with restricted tickets, winning share from road travel. These factors explain the prevalence of segmented strategies in Figure 5. Arguably, however, many of the HSR lines in the sample are not being managed to maximize profit because of issues such as public

Figure 5
Commercial strategies



Source: L.E.K. analysis and research

policy that encourages modal shift away from road or promotes connectivity with low fares. On the other hand, in Figure 4, the two U.S. routes show distinctly lower rail shares due to their price maximization strategy, resulting in limited capacity and higher fares; car travel is also encouraged by the low gasoline taxes in the U.S.

Forecasting success and profitability in HSR

Our work in HSR and discussions with operators have confirmed that several of the HSR routes in our study are profitable enough (on a point-to-point basis) to cover infrastructure costs and yield a return on investment.

This suggests that, given the right circumstances, HSR routes can be profitable, winning modal share from both air and road through the right commercial strategies.

The most successful HSR routes share some common characteristics in that they:

- Connect large cities
- Have stations located close to population and economic centers
- Are the optimal distance apart to be competitive against road and air travel
- Deliver a fast average speed (fewer intermediate stops, clear paths)
- Have commercial freedom to maximize profit rather than passenger volume

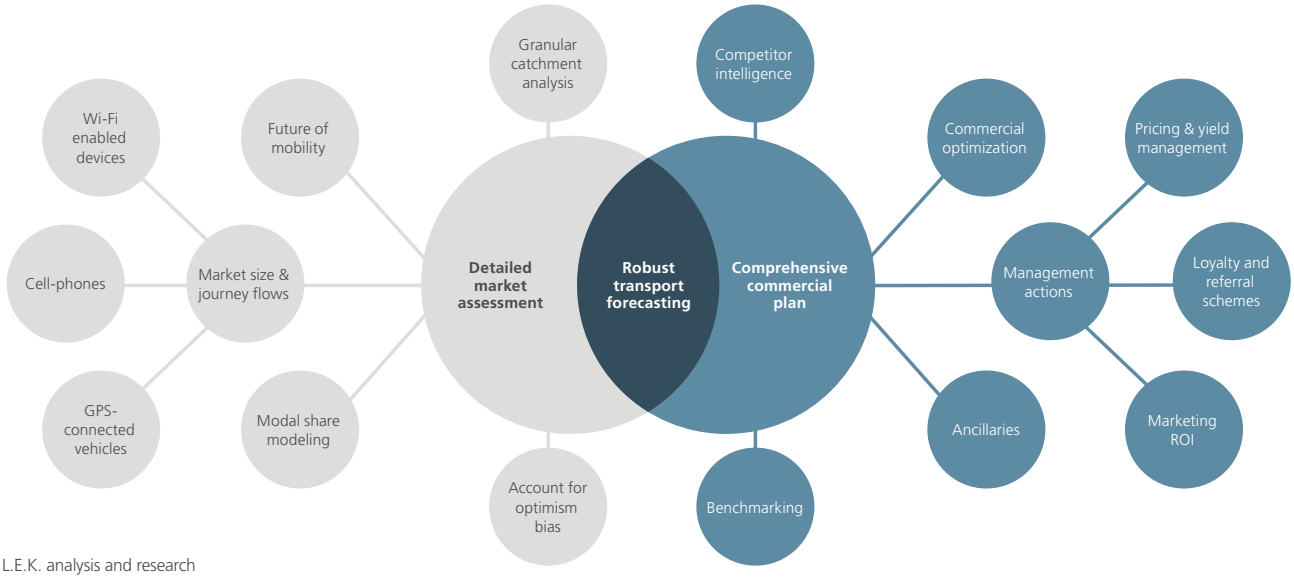
Assessing whether a proposed new line could be successful depends on gathering robust information from a range of innovative sources on the factors listed above and deriving a business case that includes the benefit of appropriate commercial policies. The key elements required for such an assessment are shown in Figure 6.

The detailed market assessment should include robust big-data sets from the catchment area to establish the current market size, and careful modeling to assess HSR's potential share versus air and road. Both shares can be very high, as shown in Figures 1 and 4, provided there are significant time savings. The comprehensive commercial plan must consider the strength of competition when determining the appropriate policies to maximize profit along the spectrum, shown in Figure 5.

If this is assessed properly, sponsors and investors can have increased confidence in value for money and returns from HSR.

Picking the right city pairs and the right commercial policies is key to profitable success in HSR. Our analysis shows clear patterns of success around the world.

Figure 6
Elements of robust transport forecasting



Source: L.E.K. analysis and research

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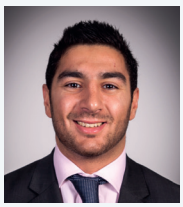
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L.E.K. Consulting is a global management consulting firm that uses deep industry expertise and rigorous analysis to help business leaders achieve practical results with real impact. We are uncompromising in our approach to helping clients consistently make better decisions, deliver improved business performance and create greater shareholder returns. The firm advises and supports global companies that are leaders in their industries — including the largest private and public sector organisations, private equity firms and emerging entrepreneurial businesses. Founded in 1983, L.E.K. employs more than 1,400 professionals across the Americas, Asia-Pacific and Europe. For more information, go to www.lek.com.