



# High-Speed Rail Market Selection Process for East Japan Railway Company



Joanna Moody - Ph.D. Candidate, Transportation (MST '16)

Joseph Sussman - JR East Professor of Civil & Environmental Engineering and Engineering Systems, Emeritus

Scott Middleton (MST/MCP '18), Patton Doyle (MST '16), Maite Peña-Alcaraz (Ph.D. Engineering Systems, '16)

## Introduction

With the safest, most efficient, and most advanced high-speed rail system in the world, the East Japan Railway Company (JR East) is uniquely positioned to expand into the global marketplace. However, there are many potential international HSR markets, and within each market there are many interrelated factors and possible business opportunities.

To successfully expand overseas, JR East must carefully select which market(s) to pursue and also the best way to proceed in those markets. Such choices require consideration of outcomes for system stakeholders and for JR East as a company.

In response to these needs, we have developed the *JR East Market Selection Process*, which consists of two sequential parts: (1) the CRIOS Process and (2) the CRIOSpre Process.

CRIOS Process	CRIOSpre Process
<b>Perspective</b> System stakeholders (client)	JR East
<b>Considers</b> How HSR may develop within the market (strategic alternatives) and the needs of the client	How JR East's international market (strategic alternatives) align with the HSR development
<b>Informants</b> Which international HSR market to pursue	What business role to adopt in a particular market

## Case Study Examples

Case	Purpose
Northeast Corridor (NEC), U.S.A	Application of both the CRIOS and CRIOSpre Processes to demonstrate their value in exploring a future international HSR development of interest to JR East
Tohoku Shinkansen (Hachinode to Shin-Aomori), Japan	Validation of the CRIOS Process by comparing results to historical data for a HSR line already constructed and under revenue service
Las Angeles - Las Vegas HSR Corridor, U.S.A	Illustrative case for CRIOS Process teaching manual

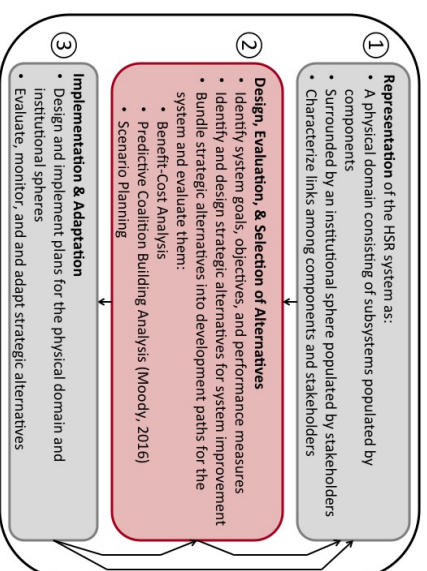
## The CRIOS Process

The CRIOS Process provides JR East deep quantitative and qualitative knowledge about HSR markets through objective and repeatable results. With this knowledge, JR East will have an understanding of the technical requirements of the HSR market as well as its social, political, and institutional context.

The CRIOS Process has the following advantages over other project evaluation techniques:

- Captures system complexity, uncertainty, and emergent behavior by characterizing interactions among all system components and stakeholders.
- Accounts for system uncertainty and considers flexibility in project design.
- Incorporates feedback/iterative learning in project exploration and evaluation.
- Helps JR East build trust and credibility with clients

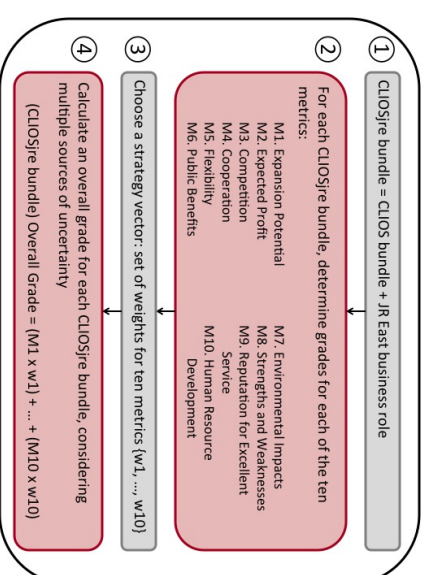
Figure 1: The CRIOS Process



## The CRIOSpre Process

The CRIOSpre Process provides a comparative framework for determining which business roles fit best within which markets. The process is designed to handle uncertainty around HSR development. Further, the CRIOSpre Process leverages transparency to facilitate open discussion within the company about tradeoffs among JR East's own business priorities.

Figure 2: The CRIOSpre Process



## Conclusions

The final output of a three-year research collaboration, the *Market Selection Process* provides a regularized structure for JR East's exploration of how different HSR markets might develop and guides strategic decision-making regarding different business roles in those markets. JR East is now adopting this process.