The BOT Experience of Taiwan's High Speed Rail Construction Project -- A successful or failure case?"

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Project Implementation

- 1992, June 25 Executive Yuan approved HSR project.
- 1993, July 16 Legislative Yuan cancelled HSR project budget and requested continued development as a BOT project.
- 1994, Dec. 5 Implementation of “Statute for Encouragement of Private Participation in Transportation Infrastructure.”
- 1996, Oct. 29 Announced a notice of intent to solicit for private investment.
- 1998, July 23 MOTC and THSRC signed concession contracts.
- 2000, Mar. 1 THSRC broke ground on the HSR project.
- 2004, May 25 First HSR T700 rolling stock arrived Taiwan.
- 2005, Jan. 27 Ceremony held to mark start of test-run.
- 2007, Jan. 5 Open to operate between Banciao and Zuoying stations.
- 2007, Mar. 2 Full operation between Taipei and Zuoying stations.
Project Content

Route: 345 km, crosses 14 cities and counties, 77 cities, towns, townships, and districts.

Stations: 10 stations at Taipei, Taoyuan, Hsinchu, Miaoli, Taichung, Changhua, Yunlin, Chiayi, Tainan and Kaohsiung

Maintenance Bases:
- Main Workshop: Yenchao
- Stabling Yards: Hsichih, Wujih and Tsoying
- Depot: Hsichih
- Civil and Electrical Maintenance Bases: Liuchia and Taipao

Travel time: Nonstop trains take 90 minutes to travel between Taipei and Kaohsiung.

Capacity: Above 300,000 seats x 345 km

System type: Steel rail, steel wheels

Structural form:
- Viaduct/Bridge: 251.2 km;
- Tunnel: 48, totaling 46.8 km;
- Embankment/cutting: 28.3 km.

Maximum operating speed: 300 KPH
The government was in charge of implementing the HSR Project prior to 1993. At that time the MOTC had completed such vital basic tasks as general planning, route and station site selection, preliminary land acquisition tasks, preliminary civil engineering detailed design tasks, E&M core system technical specifications, proposed E&M core system assessment methods, and capacity forecasting detailed review research.

Due to fiscal constraints, the government decided to implement the project by the type of BOT.
# Call for private participant

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>1993−1996</td>
<td>Holding of BOT seminars and investment promotion meetings.</td>
<td></td>
</tr>
<tr>
<td>1995, Mar. 15</td>
<td>Issuance of a preliminary private investment information memorandum.</td>
<td></td>
</tr>
<tr>
<td>1996, Oct. 29</td>
<td>Announcement the notice of intent to solicit.</td>
<td></td>
</tr>
<tr>
<td>1997, Jan. 15</td>
<td>Application cut-off date.</td>
<td></td>
</tr>
<tr>
<td>1997, Mar.〜1997, Aug.</td>
<td>Discussion and negotiation</td>
<td></td>
</tr>
</tbody>
</table>
Call for private participant - Strategy

- **Reasonably reducing private risk:**
  - Explicit statement of government's scope of work.
  - Government provided planning results including the ridership forecast, civil work design, right-of-way map and land handover schedule, preliminary design of special bridges and maintenance depots, and E&M core system technical specifications, etc..
  - Explicit statement fare adjusting mechanisms in contract.

- **Maximizing private investment:**
  - Based on a 43.2% financial self-liquidation ratio (SLR), divided the project into government’s work (government funds, approximately 25%), minimum private investment (private funds \(\geq 40\%\)), and optional work (either government or private funds).
  - Apart from work that must be performed by government (25%), the other parts were open to private investors; however, the private investment should be at least 40%.
Call for private participant - Strategy

- introducing reference core system:
  - Any proposed core system (should be a verified highly safe and reliable system, currently in commercial operation and capable of a maximum speed of at least 250 kph) would be accepted but necessary revising was requested according to Taiwan conditions (climate & human factors, etc.).

- Financing assistance:
  - Mid-long-term government funds with low interests would be provided.

- Combining the station district development concessionaire to increase the project's financial feasibility, benefits, and incentive for private participation.

- To increase construction efficiency, the concession period included both construction and operating periods.
Dividing Work to Government and Private Sector

- Work that should be performed by government better:
  - Civil work of Taipei underground section (co-construction with TRA),
  - Land acquisition,
  - Planning, design, and project supervision
  - Related infrastructure projects

- Government assisted work refer to projects that performed by private investors but require authority involved:
  - Coordination with other government agencies.
  - Assistance in resolving legal and regulatory obstacles.
  - Improvement of station feeder system.
  - Assistance with pipeline relocation, provision of power and waste soil dumping places, obtain of licenses and permission, and application for financing and tax incentives.
Dividing Work to Government and Private Sector

- Call for private participant

  - Minimum investment
    - E&M core system
    - Track
    - Maintenance depots
    - Stations
    - Test-run section
  - Optional investment
    - Civil construction
    - Safety monitoring
  - Maximum investment
    - Station district development
    - Operation and maintenance

  Note: Government shall bear responsibility for all work that not performed by private investor.

- Contracting
  - Private sector would invest and implement the maximum investment.
Concession Contract – Key Points

- The concession period: HSR build and operation for 35 years, development land in five station districts for 50 years.

- The concession company shall pledge to strive to perform HSR construction and operation, and shall bear responsibility for profit or loss. The HSR system shall be transferred to the MOTC at the expiration of the concession period.

- The government pledges to complete the work which it is responsible in a timely manner and provide necessary assistance.

- The concession company pledges to share profit from the HSR system by paying the government 10% of pre-tax surplus annually during the operating period (and shall pay a minimum of NT$108.0 billion during the entire concession operating period).

- Work share:

<table>
<thead>
<tr>
<th>Government</th>
<th>Funding</th>
<th>Private Sector</th>
<th>Funding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land acquisition</td>
<td>NT$105.7 billion</td>
<td>Civil, track, station, maintenance depot and E&amp;M core system engineering</td>
<td>NT$325.9 billion</td>
</tr>
<tr>
<td>Planning, design, and supervision</td>
<td></td>
<td>Financial costs and other</td>
<td>NT$81.7 billion</td>
</tr>
<tr>
<td>Taipei underground section</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>NT$105.7 billion</td>
<td>Total</td>
<td>NT$407.6 billion</td>
</tr>
<tr>
<td>Grand total</td>
<td></td>
<td></td>
<td>NT$513.3 billion</td>
</tr>
</tbody>
</table>
Cooperation between Government and Private Investor

- **The government's pledges and guarantees**
  - Pledges to provide assistance, but does not guarantee certain attainment.
  - With regard to the restriction or prohibition of construction on land on both sides of the HSR line, the government shall hand over needed land before the prescribed deadline and shall provide documents and information, etc.
  - Guarantees that it shall not establish nor authorize others to build a parallel, competing HSR line from Taipei to Kaohsiung within 30 years from the time the contract takes effect.

- **The private investor's pledges and guarantees**
  - Pledges to bear responsibility for design and construction quality, operating duties, profit or loss, industry cooperation, and technology transfer, and shall employ core system for which commercial operating experience is available.
  - Guarantees not to make any claims against or seek compensation from the government due to inability to attain any of the assistance pledged by the government pledge.
Financing Assistance

- While the government shall not provide financing guarantees, it shall provide full assistance, and shall provide NT$240 billion in mid-long-term funds. Banks shall provide loans in accordance with credit appraisal procedures, and shall bear the risk of lending. Repayment of financing shall be guaranteed by future HSR operating revenue.

- To protect the banks' rights, and increase their willingness to provide financing, the MOTC, THSRC, and the bank consortium shall sign a "three-party contract," which shall prescribe payment procedures and methods for compulsory purchase of assets if the HSR BOT contract is terminated.

- THSRC signed a contract of Syndication Loan to HSR Project amounting NT$ 323.3 billion on February 2nd 2000 with 25 local banks.

- Responding to a shortfall in funds caused by cost overruns from the delayed opening of the HSR system and unexpectedly poor capital-raising, THSRC subsequently completed an NT$65.5 billion second Syndication Loan case in 2006, and issued US$300 million in overseas convertible bonds.
Issues to be Resolved after Operation

“Success on HSR high-tech quality and business operation model; Failure on BOT public interest-oriented accounting system.”

Successful aspects:

- lower construction costs (including interest cost of capital) and higher efficiency: 440 NT$ billions (1991)/ 407.6 b. (1998)/ 449.7 b. (June 2009)
- Adding more ecology and humanitarian concepts and actions.
- Reform corruption on public infrastructure construction.
- Others (i.e. tax incentive scheme for advanced equipments?)

Failure (or contract not cover) aspects:

@ construction cost depreciation period
@ Related infrastructure projects by government
@ guaranteed low bank loan interest rate?
@ arrangement of extending routes and/or extra stations
The End
Your comments are welcome!

Appendix following…
Project Oversight – Master Schedule

- Call for private participant (1996/10)
- Contract signed (1998/7/23)
- Preparation and financing

- Civil Works Commencement (2000/3)
- Civil Works Complete (2004/11)

- Trackwork (2002/6)
- Trackwork Complete (2005/6)
- Core Installation (2003/9)
- Core Test Complete (2006/11)

- 57 Months Civil works
- 62 Months Trackworks
- 85 Months HSR Project

- HSR Operation (2007/3)
Concession Contract—Build (B) Requirements

- Implementation of the project by private Sector is intended to provide the efficiency and vigor of a private corporation. For its part, the government shall play a supervisory role and handle such issues of major public concern as safety and environmental protection.

- The applicant is requested to provide E&M guidelines and specifications from a system already in commercial operation to serve as benchmarks for future applications and final inspection.

- System guidelines and specifications shall include "general requirements," "functional requirements," "safety requirements," "quality requirements," and "interface requirements."

- The concession company shall commission an independent, impartial professional organization to perform system function, quality, and safety certification work. After the completion of system, the concession company shall submit full testing and inspection reports plus certification results and relevant documents from the professional certification organization as a precondition to application for final inspection.
Concession Contract—Operation (O) Requirements

- Since private sector must focus on maximization of profits, the government shall determine clear operating guidelines and specifications, supervise the concession company’s maintenance of service functions and standards, and make sure that the concession company complies with safety and environmental protection quality requirements.

- As for safety considerations, the concession company shall design system equipment and measures from the point of view of "fail-safe" mechanisms. There must be devices to detect accidents and maintain passenger safety.

- While giving the concession company the leeway to make flexible adjustments, fares will be controlled to protect the public's right to use the HSR at an affordable price.
Concession Contract—Transfer (T) Requirements

- The target of transfer includes all existing operating assets acquired due to construction and operation of the HSR and other assets needed to maintain HSR operation.

- Transfer under normal circumstances: The scope of compensated transfer shall consist of those assets possessing book value at the expiration of the concession period purchased by the concession company within five years before the transfer deadline with the MOTC's consent and still capable of normal operation; the scope of uncompensated transfer shall consist of the remaining assets.

- Transfer under abnormal circumstances: If the contract has been terminated for any reason before the expiration of the concession period, the government shall implement compulsory take-over of the project and compulsory purchase of usable operating assets needed for HSR operation and under-construction projects.

- The concession company shall warranty assets against defect of rights at the time of transfer to the MOTC, and shall guarantee that assets in normal, good operating condition or are fit for use.
Development of Station Districts

- The government is actively implementing the following measures to facilitate station development and provide an excellent investment environment:
  - Investment of NT$39.604 billion in 28 road projects in 6 stations.
  - Give priority to build MRT system to link to HSR stations.
  - 41-47% of the area of 5 station districts is for public facilities which has cost the government NT$20.4 billion.
  - Establishment of a high-efficiency ultra-broadband information network.
  - The Executive Yuan has established a dedicated steering committee and single-window service to simplify investment application review procedures, and provide financing, tax incentives and consulting services.
HSR Station Transfer Systems

- Improving station feeder systems
  - Sharing stations with TRA
  - Sharing stations with MRT
  - Improvement of access roads (widening or new construction)

- Transfer facilities
  - Bus transfer stations
  - Bus stopping bays
  - Parking lots
  - Pick-up parking
  - Taxi lines
  - Car rental services
  - Shuttle bus service

<table>
<thead>
<tr>
<th>HSR</th>
<th>Railway</th>
<th>MRT</th>
<th>Access road improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taipei Station</td>
<td>Taipei Station</td>
<td>Red Line, Blue Line</td>
<td>3 projects</td>
</tr>
<tr>
<td>Banciao Station</td>
<td>Banciao Station</td>
<td>Blue Line</td>
<td>3 projects</td>
</tr>
<tr>
<td>(Nangang Station)</td>
<td>Nangang Station (end of 2007)</td>
<td>Blue Line (2008)</td>
<td>5 projects</td>
</tr>
<tr>
<td>Taoyuan Station</td>
<td>—</td>
<td>Airport MRT (end of 2010)</td>
<td>5 projects</td>
</tr>
<tr>
<td>Hsinchu Station</td>
<td>Neiwan Branch (end of 2009)</td>
<td>—</td>
<td>5 projects</td>
</tr>
<tr>
<td>(Miaoli Station)</td>
<td>New Fengfu Station (not finalized)</td>
<td>—</td>
<td>5 projects</td>
</tr>
<tr>
<td>Taichung Station</td>
<td>New Wurih Station</td>
<td>Green Line (2013)</td>
<td>3 projects</td>
</tr>
<tr>
<td>(Changhua Station)</td>
<td>—</td>
<td>—</td>
<td>(3 projects, not finalized)</td>
</tr>
<tr>
<td>(Yunlin Station)</td>
<td>—</td>
<td>—</td>
<td>5 projects</td>
</tr>
<tr>
<td>Chiayi Station</td>
<td>—</td>
<td>BRT</td>
<td>6 projects</td>
</tr>
<tr>
<td>Tainan Station</td>
<td>Shalun Branch (end of 2009)</td>
<td>—</td>
<td>3 projects</td>
</tr>
<tr>
<td>Zuoying Station</td>
<td>New Zuoying Station</td>
<td>Red Line</td>
<td>6 projects</td>
</tr>
</tbody>
</table>
The government has determined station districts and performed urban planning in order to promote development in the areas surrounding HSR stations.

<table>
<thead>
<tr>
<th>Station</th>
<th>District (ha)</th>
<th>Planned Population</th>
<th>Specific Zone (ha)</th>
<th>Business zone (ha)</th>
<th>C/M park (ha)</th>
<th>Development positioning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taoyuan</td>
<td>490</td>
<td>60,000</td>
<td>19.68</td>
<td>8.55</td>
<td>22.00</td>
<td>International commercial city (proposed)</td>
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<tr>
<td>Hsinchu</td>
<td>309</td>
<td>45,000</td>
<td>14.76</td>
<td>4.87</td>
<td>38.30</td>
<td>Biomedical science park</td>
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<tr>
<td>Miaoli</td>
<td>440</td>
<td>21,000</td>
<td>7.08</td>
<td>4.90</td>
<td>10.02</td>
<td>Cultural innovation parkl</td>
</tr>
<tr>
<td>Taichung</td>
<td>273</td>
<td>23,000</td>
<td>29.43</td>
<td>11.3</td>
<td>15.61</td>
<td>Entertainment and shopping mall</td>
</tr>
<tr>
<td>Changhua</td>
<td>963</td>
<td>5,000</td>
<td>7.81</td>
<td>-</td>
<td>-</td>
<td>Floricultural biotech park</td>
</tr>
<tr>
<td>Yunlin</td>
<td>422</td>
<td>47,000</td>
<td>8.36</td>
<td>6.15</td>
<td>9.66</td>
<td>Lakeside city (proposed)</td>
</tr>
<tr>
<td>Chiayi</td>
<td>135</td>
<td>20,000</td>
<td>12.51</td>
<td>3.14</td>
<td>9.87</td>
<td>Leisure recreation park</td>
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<tr>
<td>Tainan</td>
<td>300</td>
<td>32,000</td>
<td>16.73</td>
<td>4.02</td>
<td>47.17</td>
<td>Research and ecological park</td>
</tr>
<tr>
<td>Total</td>
<td>3,332</td>
<td>253,000</td>
<td>116.36</td>
<td>42.93</td>
<td>152.63</td>
<td></td>
</tr>
</tbody>
</table>

| in charge unit | Central and local governments | THSRC | BOHSR |

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