Impact of HSR Stations on Local Development
A Delphi Survey

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High-speed rail systems are planned for California and other US states, but there is a significant debate regarding the transportation, environmental, economic, and development impacts that such systems will have.
HSR Expectations

1. Transportation goals
2. Environmental goals
3. Economic development goals
4. Urban development/spatial restructuring goals
“High Speed Rail will be the maker of some cities but the breaker of others”

Peter Hall (2009)

Little systematic evidence as to which factors lead to positive and desirable development patterns around HSR stations, and which spatial planning strategies lead to positive local outcomes.
Scope of the Study

This study draws from the experiences of other countries (through a literature review and a Delphi survey process) so as:

1) To identify the most important positive and negative effects that such development often entails;

2) To identify the important pre-conditions for positive development around high-speed rail stations;

3) To extract lessons for California.
Literature Review
Impacts of HSR on Station Areas

• Most studies focus on the transportation, environmental and economic development goals of HSR; a slimmer body of work examines its spatial impacts.

• Bulk of research so far focuses on:
  1. Cost-benefit analyses of proposed or realized projects
  2. Ridership forecast studies; estimation of potential for capturing travel demand from other modes.
  3. Economic development impacts on cities along HSR network.
Literature Review: Economic Impacts of HSR

• How much development is directly attributable to HSR?

• Which factors lead to positive economic impacts?

• Does HSR generate economic development or merely redistributes it?

**Economic development Impacts**

- Increase of GDP
- Job growth
- Population growth
- Increase of land/property values
Literature Review: Economic Development
Impacts of HSR

• Differential impacts depending on type of city (first-tier; second-tier); distance from other major cities on the network; extent of other modal links and transportation networks; condition of local economy and land market; location of station, extent of anticipatory planning and policy intervention (Vickerman 1997; Givoni 2006; Garmendia et al. 2008).

• Most growth and economic benefits accrue to the first-tier cities on the network (Gutierrez et al. 1996; Hall 2009; Murakami and Cervero 2010).

• Some observed benefits in second-tier cities (Greengauge 21 2006), Ahlfeldt and Fedderson 2009; Garmendia et al. 2008)

• May extend the spatial reach and economic role of exurban cities, if it combines with airport facilities (Hall 2009; Kasarda 2010).

• But some cities have witnessed adverse economic effects.
Urban development impacts

• HSR stations have acted as catalysts for urban development in some first-tier cities such as Amsterdam (Zuidas); Brussels (Midi); Madrid (Prolongacion de la Castellana); London (King’s Cross-St. Pancras), and some second-tier cities such as Lille (Euralille); Rotterdam (Centraal); Zaragoza (Digital Mile); Ciudad Real, etc.

• Some HSR stations have not brought catalytic effects or significant new development (e.g. in Berlin’s Central Station, in Tours, Ashford Station at Kent, Ebbsfleet International Station).
Challenges of Development around HSR stations (Bertolini 1998)

1. Spatial challenges
2. Temporal challenges
3. Functional challenges
4. Financial challenges
5. Management challenges
Delphi Survey

- 27 experts-participants from 10 countries
- 20 participants had position at university or think tank
- 3 participants had leading position in a public sector agency involved in HSR design, development, or evaluation
- 4 participants had position in a private sector company involved as consultant, urban designer, or developer of HSR stations
**QUESTION 1:** Referring to an existing HSR system with which you are familiar, please describe the positive effects this system has had on the urban development of station-adjacent communities.

<table>
<thead>
<tr>
<th>CENTRAL CITIES</th>
<th>PERIPHERAL CITIES</th>
</tr>
</thead>
<tbody>
<tr>
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<td>1. Catalyst for additional development</td>
</tr>
<tr>
<td>2. Catalyst for additional development</td>
<td>2. Urban regeneration</td>
</tr>
<tr>
<td>3. New commercial development</td>
<td>3. Brownfield redevelopment</td>
</tr>
<tr>
<td>4. New major buildings</td>
<td>4. Public sector involvement</td>
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<tr>
<td>5. Increased public sector investment</td>
<td>5. Increased regional significance</td>
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Positive Development Effects

1. New or revitalized neighborhoods around stations (e.g. Amsterdam Zuidas; Lisbon East)

2. New city cores and commercial centers (e.g. Lyon-Part Dieu; Shin-Osaka)

3. Regeneration of formerly derelict districts (e.g. Euralille) and brownfield sites (e.g. Kings Cross)

4. New architectural landmarks (e.g. East Lisbon)
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**QUESTION 2:** Please describe some of the negative effects that this system has had on the urban development of station-adjacent communities and what may have precipitated them.

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<td>1. Barrier effect</td>
<td>1. Significant cost</td>
</tr>
<tr>
<td>2. Significant cost</td>
<td>2. Barrier effect</td>
</tr>
<tr>
<td>3. Traffic congestion</td>
<td>3. Sea of parking lots around station</td>
</tr>
<tr>
<td>4. Gentrification/displacement</td>
<td>4. Land speculation</td>
</tr>
<tr>
<td>5. Land speculation</td>
<td>5. Unattractive node not conducive to residential development</td>
</tr>
</tbody>
</table>
QUESTION 3: In your view, which were the most important preconditions for the generation of the positive effects you have outlined in the first question?

CENTRAL CITIES

1. Central station location
2. Integration of station with surroundings
3. Station located at a transportation node
4. Strong political will/vision
5. Good and frequent HSR service

PERIPHERAL CITIES

1. Station located at a transportation node
2. Strong public transit connection to surrounding areas
3. Integration of station to surroundings
4. Good and frequent HSR
5. Strong political will/vision
Shanghai, Longyang Maglev Station
(from Pudong Airport)

- Central city, but peripheral area location
- Station as new landmark
- No catalyst for new development, investment
- Not well integrated with surroundings
- Barrier effects
- No apparent urban design for station area
Fresno Station and station area plan

Moule + Polyzoides, Architects
Metz, France (pop: 125,000 – city; 430,000 – metro area)
Travel time to Paris: 82 minutes via HSR

1. Train station, integrating HSR
2. Direct historic connection to the city
3. Passage beneath tracks
5. Site for future urban connective tissue

(note: minimal surface parking)
“Attempts to integrate railway infrastructure into an urban environment can include ‘soft’ solutions (treatment of borders, increasing permeability, constructions of different types of railway crossing, adapting to specific topographic site conditions) and ‘hard’ solutions (covering sections of the rail tracks or constructing rail bypasses)… The restructuring of the railway system offers the opportunity to improve the integration of rail space within the urban fabric and thereby palliate the barrier effect that railway installations traditionally create [Delphi survey respondent].
# California Station Typology

<table>
<thead>
<tr>
<th>Large Metro</th>
<th>Small metro</th>
<th>Suburban center</th>
<th>Suburban dormitory</th>
<th>Exurban dormitory</th>
<th>Rural</th>
<th>Industrial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Los Angeles</td>
<td>Riverside</td>
<td>Anaheim</td>
<td>Norwalk</td>
<td>Murrieta</td>
<td>Merced</td>
<td>City of Industry</td>
</tr>
<tr>
<td>San Jose</td>
<td>Bakersfield</td>
<td>Burbank</td>
<td>Sylmar/San Fernando</td>
<td>Palmdale</td>
<td></td>
<td></td>
</tr>
<tr>
<td>San Francisco</td>
<td>Fresno</td>
<td>Ontario</td>
<td></td>
<td>Gilroy</td>
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</tbody>
</table>
“Only those stations which are prepared to support HSR with complementary investment will stand to gain” (Vickerman 1997).

“Good land use does not automatically follow new transit; policies must be in place to link investments in the high-speed train with supportive land use” (TransForm)