Better Network Design for Seamless PT

: Physical Integration of PT Network

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KTX (High-speed Rail) Network in Korea

< Current and Future KTX network >

< Current Travel Time, KTX vs. Auto >
Before and After KTX (High-speed Rail)

Korea is becoming a One City–Nation by KTX

Before KTX:
- 4 hours 40 minutes
- 5 hours

After KTX (in 2015):
- 1 hour 50 minutes
- 2 hours 20 minutes

Source: KTX Economic Region and Regional Development, KOTI(2012)
1. Why Physical Integration?

Modal Share of PT for Regional Trips after KTX

- Recent 5 years of Modal share, not changed, Auto 65%, PT 35% (In 2004, KTX stared to run)

[Regional Trips by Modes] Source: KTDB, each year
For longer than 200km travel, auto shares over 40%
Reasons why auto for Longer Trip

- Travel convenience in local place (destination area), Poor accessibility to terminals and stations at origin/destination

[Reasons for auto use]

Source: Questionnaire Survey by KOTI(2012)
1. Why Physical Integration?

Obstacles for KTX Usage

- Inconvenient access to terminals and stations, Transfer difficulty, etc.

![Bar chart showing the percentage of problems for using KTX]

- Poor accessibility to terminals and stations: 33.3%
- High cost of access mode: 5.3%
- Inconvenience of transfer system: 20.5%
- Insufficiency of directional sign: 3.8%
- Crowded in station: 12.1%
- Lack of conveniences: 5.3%
- Poor surroundings of stations: 6.8%
- Traffic congestion: 7.6%
- Etc.: 5.3%

[Problems for using KTX]
Source: Questionnaire Survey by KOTI(2012)
2. How Physical Integration?
Directions for Physical Integration

- Hub & Spoke Integrated public transport system for better connectivity
- Shortest transfer distance and time for better transfer

Source: KOTI,『Master Plan for Transit Center Complex in Korea』, 2011
Hub & Spoke Type Integrated PT System

"One to many" ⇔ One to "Hub" & "Spoke"
- After KTX operation, Seoul to Daegu trips increased 1.6 times
- Increased between KTX East Daegu Stat. to Adjacent cities

Source: KOTI, "2011 KTX Economic Development, KTX uses’ survey"
2. How Physical Integration?

- Nation-wide Hub & Spoke System Design (Connectivity)

- Make transfer distance and time as short as possible (Transfer)

[Conceptual Design of National Hub & Spoke type integrated PT system]
3. Korea's Model for Physical Integration
Seoul's Reform for PT System

Seoul Station

Transport Modes
- Subway Line 1
- Subway Line 4
- KTX
- Gyeongeui Line
- Airport Railroad
- 99 Bus Routes

Median Bus Lanes and Bus Transfer Center (2009)

<Before>

<After>
Seoul's Reform for PT System

IIA Access Transport

**IIA Access Modes**
- Airport Railroad
- 119 Bus Routes

**Mode Share**

<table>
<thead>
<tr>
<th>Mode</th>
<th>Modal Share(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auto</td>
<td>23.1</td>
</tr>
<tr>
<td>Taxi</td>
<td>6.7</td>
</tr>
<tr>
<td>Limousine Bus</td>
<td>55.7</td>
</tr>
<tr>
<td>Bus</td>
<td>8.6</td>
</tr>
<tr>
<td>Rail</td>
<td>5.9</td>
</tr>
</tbody>
</table>

**Feature**
- Nation-wide Limousine Bus Network
- KTX Operation to IIA by 2014
4. What's Next
Developing Transit Center at Hubs

- Connecting Variety of Feeder Lines
- Shorten Transfer Distance and Time

[Chunan·Asan Station Transit Center Conceptual Design]
Source: KOTI,『Master Plan for Transit Center Complex in Korea』, 2011.
4. What's Next?

Expectations

- Case of Chunan · Asan Station (80 minutes saving)
4. What's Next?

Expectations

- **Switching Effect**
  - In case of developing 23 Transit Centers, 33% of auto users switch to pt.

<table>
<thead>
<tr>
<th>구분</th>
<th>Access Modes</th>
<th>Before</th>
<th>After</th>
<th>Change</th>
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</thead>
<tbody>
<tr>
<td>Transit Centers</td>
<td>Auto</td>
<td>18%</td>
<td>12%</td>
<td>-6%</td>
</tr>
<tr>
<td></td>
<td>Public transit</td>
<td>66%</td>
<td>69%</td>
<td>2%</td>
</tr>
<tr>
<td></td>
<td>etc</td>
<td>16%</td>
<td>20%</td>
<td>4%</td>
</tr>
</tbody>
</table>

- **Green-house Gas Reduction Effect**
  - Reducing auto mileage can lead to reduce G.G. 249,481 ton/year

Source: KOTI,『Master Plan for Transit Center Complex in Korea』, 2011.
Transit Center Complex

- **Building multi-purpose intermodal transit center**
  - Building intermodal transit center for every KTX stations
  - Increasing station area development potential
  - Combining commercial, residential, business function with intermodal transport center
Link to Urban and Regional Development

- **Rail transit-oriented development (TOD)**
  - Differential development density and land use according to zone
  - Primary station area: high density development,
    secondary station area: low-medium density development

- **Win-win development**
  - Fostering differentiated urban function from exiting CBD
  - Performing a role as a regional growth hub (KTX Economic Zone Development)
KOTI has already performed R&D project on “the Development of Transport Connectivity and Transfer Technology” for 5 years during 2006 and 2011 funded by government($20 million).
- One part is facility design of transit center
- The other part is operation technology for transit center

My first suggestion
- Utilizing the KOTI’s experience, it is recommended to start a new co-work project with ITF/OECD for developing “physical integration standards and guidelines for seamless public transport this year, which can be used globally”.
Korea has a variety of PPP transport projects funded by private sector.
- Highway projects, Railway projects, Rail Station Rebuilding projects
- Recently launched 8 pilot projects for developing transit center based on the National Integrated Transport System Efficiency Act (2009):
  - The key point is how to share burdens financially in the process of developing transit centers.

My Second suggestion
- Utilizing Korea’s experience, it is recommended to start a new co-work project with ITF/OECD for developing “a new PPP model as a way of stimulating the development of transit centers utilizing private capital next year, which can be applied globally”.
One of the most important elements for success is to just try it! Without a trial and error, nothing can be gained!

THANK YOU

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