

Session 4: Prof. Dr. Sungbong Chung and Prof. Dr. Kook-Hwan Cho

Presentation entitled: Current Situation and Prospects of Korea Train Express (KTX)

Biographic Data of Speaker



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- 1998.3 - 2003.8: Doctor at Seoul National University
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- Assistant Professor: Seoul National University of Science and Technology (2010. 3 – Present)
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- Part Time Professor: Graduate School of Railroad, Seoul National University of Technology (2008. 3 – 2009. 12)
- Research Assistant Professor: University of Illinois at Urbana Champaign (2004. 1 – 2004. 10)

CURRENT SITUATION AND PROSPECTS OF KOREA TRAIN EXPRESS (KTX)

The title of presentation is “Current Situation and Prospects of Korea Train eXpress(KTX)” as assigned in the tentative schedule table.

Through the presentation, some problems and issues related to transportation, especially in KTX will be covered as follows.

- 1) The problems which Korea has faced prior to the construction of KTX
- 2) The current condition of construction of railway
- 3) The current condition of ridership of KTX
- 4) The effects of KTX (Reduction of congestion and emission etc.)
- 5) Introduction of Station Adjacent Area Development Project
- 6) Prospects of Korea Train eXpress (KTX)



August 26, 2011

Sungbong Chung & Kookhwan Cho



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I n t r o d u c t i o n

■ Problems in SOC investment

1. Introduction

- Standstill of mode choice ratio due to lack of investment of railway
 - ✓ During last 20 years, 3,884km increase in inter-regional highway
 - ✓ Only 287km increase in railway
 - ✓ Mode share for inter-regional transportation of railway
 - ✓ Passenger: 13.6('01) → 15.6('07), Freight: 7.6('01) → 7.5%('07)
- Insufficient competitiveness in speed compared to roads
 - ✓ Travel Time(Road/Railway) : Seoul-Yeosu 4:30 / 5:15, Seoul-Masan 3:40 / 4:48
 - ✓ Average Speed(km/h) : Gyeongbu line 92, Jeolla line 78, Donghae line 48 etc.
- Similar network layout between railway(6×6) and road(7×9)
 - ✓ Overlap in investment and inefficient network workability

1. Introduction

■ Problems in SOC investment

- Focusing on establishing current railway system
 - ✓ The budget for HSR(461km) is about 20% of all the railway(2,355km)
 - ✓ However, HSR has high returns compared to Current railway

Classification	Const. Cost (100 million won)	Ratio of Government Subsidies (%)	Profits (100 million won)
Current Railway	379	100	▲ 3,033
HSR	486	50	+ 2,921

- Low competitiveness in logistics due to high transportation time/cost
 - ✓ In case of transporting 40t container from Capital area to Pusan
 - ✓ Railway: 0.5 million won, 9 hours
 - ✓ Road: 0.42 million won, 6 hours

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Current Situation of KTX

2. Current Situation of KTX

■ Current Operation line and future plan of KTX

■ Gyeongbu KTX Line

- 1st Phase
 - ✓ 1992~2004
 - ✓ between Seoul and Dongdaegu
- 2nd Phase (Nov. 2010 open)
 - ✓ 2004~2010
 - ✓ between Dongdaegu and Busan

■ Honam KTX Line

- 2006~2017
- between Osong and Mokpo

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2. Current Situation of KTX

■ Gyeongbu KTX 1st phase Opening : April 1st , 2004

Number of Trainset	46 trainsets
Train Configuration	20 cars (PC+MT+16TR+MT+PC)
Carrying Capacity	935 seats : 1 st class 127, 2 nd class 808
Traction Power	13,560kW (18,200HP)
Operation Speed	300 Km/h (Safety Limit 330 Km/h)
Train Control	ATC (Automatic Train Control)

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2. Current Situation of KTX

■ Gyeongbu KTX 2nd phase Opening : March 2st , 2010

Number of Trainset	6 trainsets(2010.2)
Train Configuration	10 cars (PC+8T+PC), Possible to couple 2 trainsets
Carrying Capacity	363seats : 1 st class 30, 2 nd class 333 (2 seats for the disabled)
Traction Power	8,800Kw (11,800HP)
Operalon Speed	300 Km/h (Safety Limit 330 Km/h)
Train Control	ATC (Automatic Train Control), ATP

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2. Current Situation of KTX

■ Travel distance and number of Service

Classification	Service Distance	Number of Service
2004 (Apr. ~ Dec.)	13,331,738.2	36,186
2005	19,731,646.3	52,436
2006	20,618,228.9	54,499
2007	20,450,295.3	54,646
2008	21,278,695.2	57,255
2009 (April)	5,277,981.7	14,236
Total	100,688,585.6	269,258

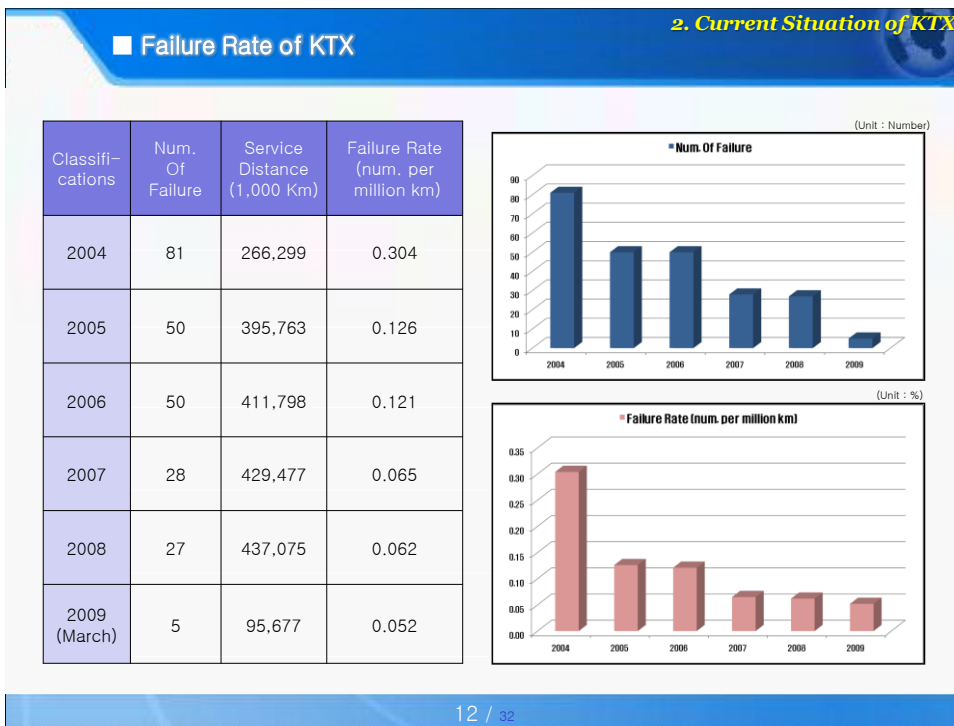
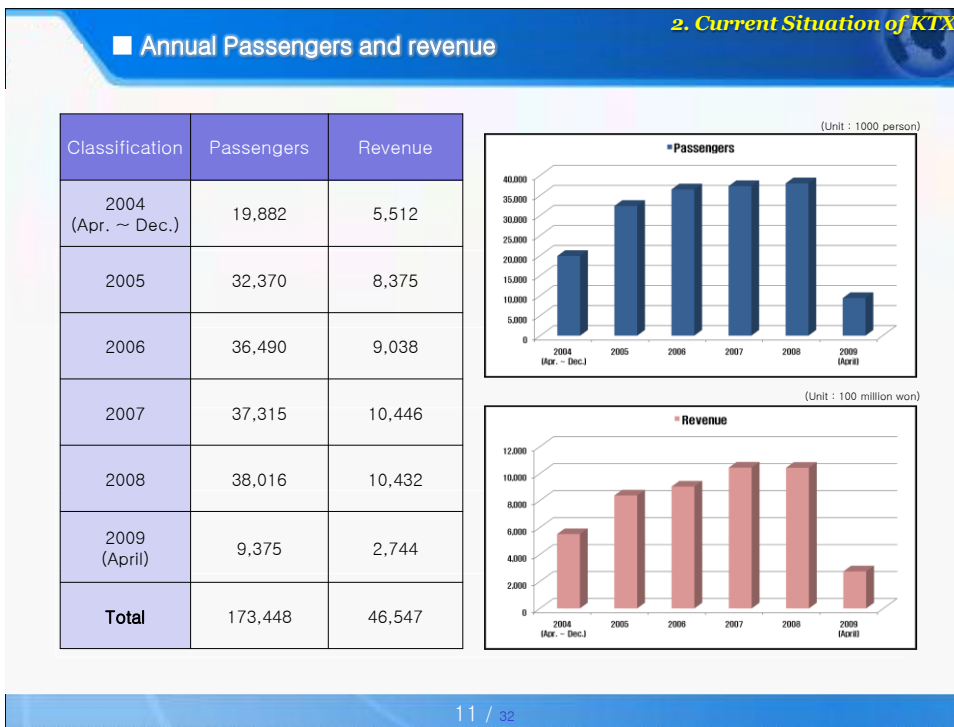
(Unit : km)

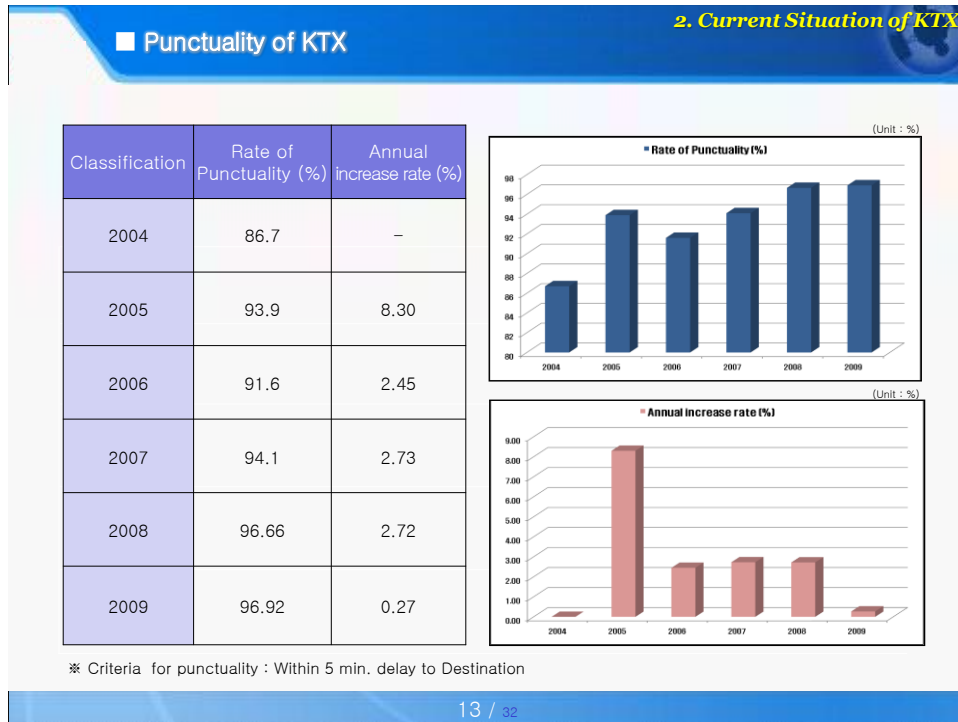
* Service Distance

(Unit : number)

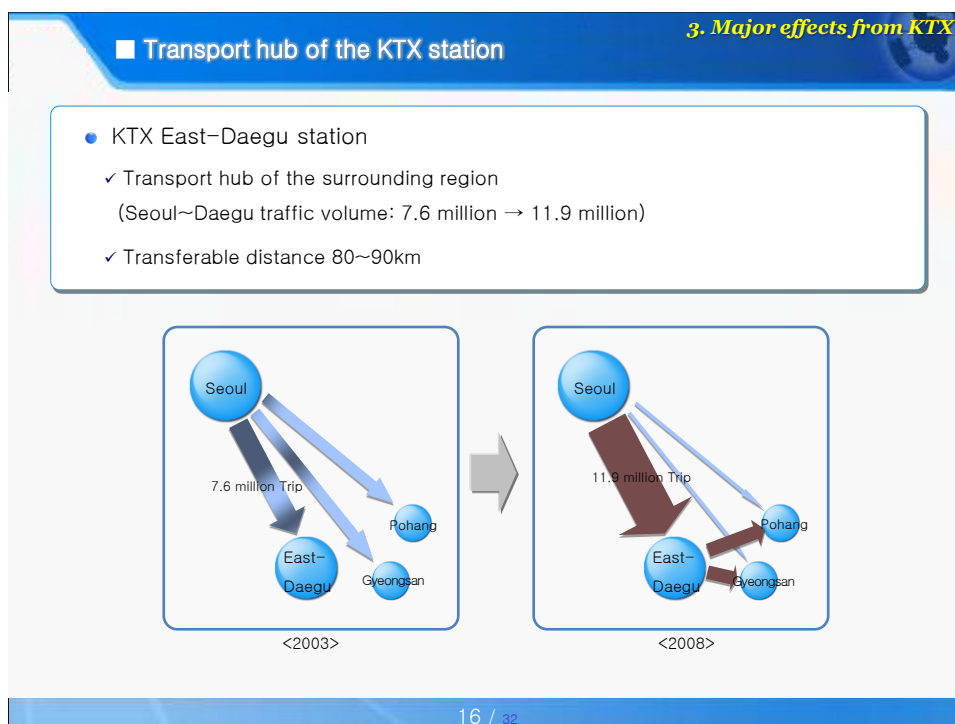
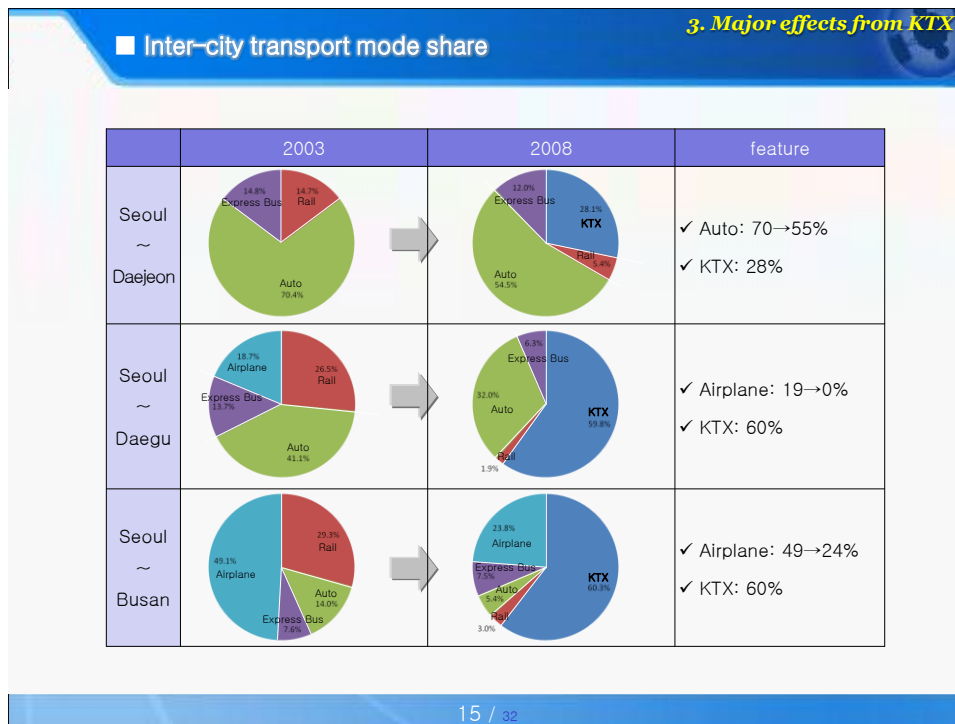
* Number of Service

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III Major effects from KTX



3. Major effects from KTX

■ Transport Characteristics of KTX Station

- Seoul station: medical, educational, cultural, shopping trip
- Cheonan-Asan station: commuting to Seoul
- Busan station: tour, medical trip

station	family, friend related	business	commute	school	private education	tour	shopping	medical	cultural
Seoul	40.8%	34.5%	1.1%	2.8%	<u>2.2%</u>	11.4%	<u>1.2%</u>	<u>4.2%</u>	<u>1.8%</u>
Cheonan-Asan	41.4%	35.7%	<u>3.9%</u>	<u>7.5%</u>	1.3%	8.7%	0.0%	0.5%	1.0%
Daejeon	46.5%	35.5%	1.3%	4.1%	0.7%	8.7%	0.4%	1.6%	1.2%
East-Daegu	50.5%	32.9%	0.7%	2.4%	0.7%	10.0%	0.2%	2.3%	0.3%
Busan	45.5%	29.5%	0.5%	0.8%	0.8%	<u>19.7%</u>	0.7%	1.8%	0.8%

Source: "Survey on KTX trips and effects on regional economy", KOTI (2010)

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3. Major effects from KTX

■ New economic activities using KTX

- Growth of business activities
 - ✓ Increasing business trips of KTX station-based cities
 - ✓ Visiting head and branch office, local clients

Question) Do you think trips to other regions are increasing because of KTX?

Category	Percentage
Increasing	48.3%
Unchanging	30.1%
Decreasing	21.6%

station	trip frequency		
	increasing	unchanging	decreasing
Seoul	33.8%	38.6%	27.6%
Cheonan-Asan	76.9%	17.6%	5.5%
Daejeon	39.9%	37.7%	22.4%
Daegu	49.5%	27.7%	22.8%
Busan	50.4%	28.1%	21.5%

Source: "Survey on KTX trips and effects on regional economy", KOTI (2010)

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3. Major effects from KTX

■ New economic activities using KTX

- Decentralizing convention activities

<International conference record>

<298 cases in 2003> <635 cases in 2008>

Source: Korea Tourism Organization

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3. Major effects from KTX

■ New economic activities using KTX

- Convention and commerce around KTX Station

<Convention in KTX station(12 station, 51 room)>

year	Convention hall	number of conferences	attendance	revenue (1000 won)
2005	6	153	4,012	17,113
2006	33	2,260	74,793	285,686
2007	38	6,780	248,724	869,778
2008	51	8,283	307,541	1,246,997
Total		17,476	635,070	2,419,574

Source: Korail

- ✓ Increasing demand of convention facilities in KTX station
- ✓ New international conference facility in KTX Seoul station

Sales of Lotte Mart in KTX Seoul station

sales growth rate(unit:%)

Source: Maeil Business Newspaper, 2010.3

- ✓ Rapid growth of department store sales in KTX Seoul station

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IV Major changes by KTX

4. Major changes by KTX

■ Travel time between major cities

- Travel time by road : Time between toll gates
- Present Traveling time by Railway : Non Stop Station of KTX
→ Saemaeul and Mugunghwa Train Stops
- Present Traveling time by Railway : Performance improvement is considered
- ※ For future travel time in Railway, additional lines in plan are included

Sections	Roads	Railway	
		Present	Future(2020)
Seoul – Pusan	4:20	2:46	1:43
Seoul – Daegu	3:00	1:37	1:10
Seoul – Kangneung	2:20	6:07	0:58
Seoul – Kwangju	3:00	2:52	1:11
Daejun – Mokpo	2:50	2:15	1:13
Pusan – Kwangju	2:50	4:02	1:40
Pusan – Kangneung	5:00	7:35	2:16

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4. Major changes by KTX

■ Increase in Passengers of Railway

- After the opening of KTX
 - ✓ Seoul to Daegu : 9.4 times of passengers (73 → 6.88 million persons/day)
 - ✓ Seoul to Pusan : 2.2 times of passengers (3.07 → 6.65 million persons/day)

Gyeongbu KTX line recorded 266.3 billion won in the black in the 2009

<Changes in Mode Share after KTX opening ('03→'07, 10 thousand) >

Modes	Seoul-Daegu				Seoul-Pusan			
	2003		2007		2003		2007	
Railway	73	12%	688	60%	307	30%	655	60%
Auto	251	41%	347	30%	111	11%	93	8%
Bus	143	23%	108	9%	98	9%	90	8%
Airplane	144	24%	5	0.4%	52	50%	265	24%

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4. Major changes by KTX

■ Mode share by traveling distance (2025)

Classification	~100Km	100Km~200km	200Km~300km	300Km~	Total
Auto	53.4%	48.6%	37.9%	30.3%	52.0%
Bus	22.8%	18.4%	15.3%	13.3%	21.5%
Railway	23.8%	33.0%	46.8%	56.4%	26.5%
HSR	1.0%	26.9%	41.7%	50.5%	8.6%
Regional Railway	9.9%	6.1%	5.1%	5.9%	8.8%
Urban Railway	12.9%	-	-	-	9.1%
Total	100.0%	100.0%	100.0%	100.0%	100.05

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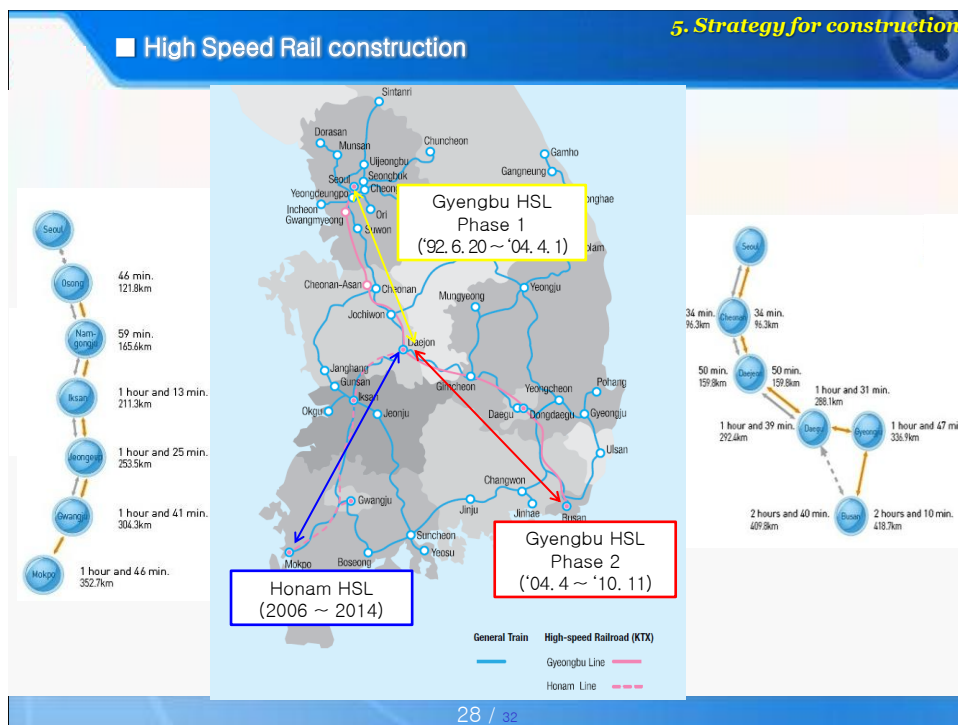
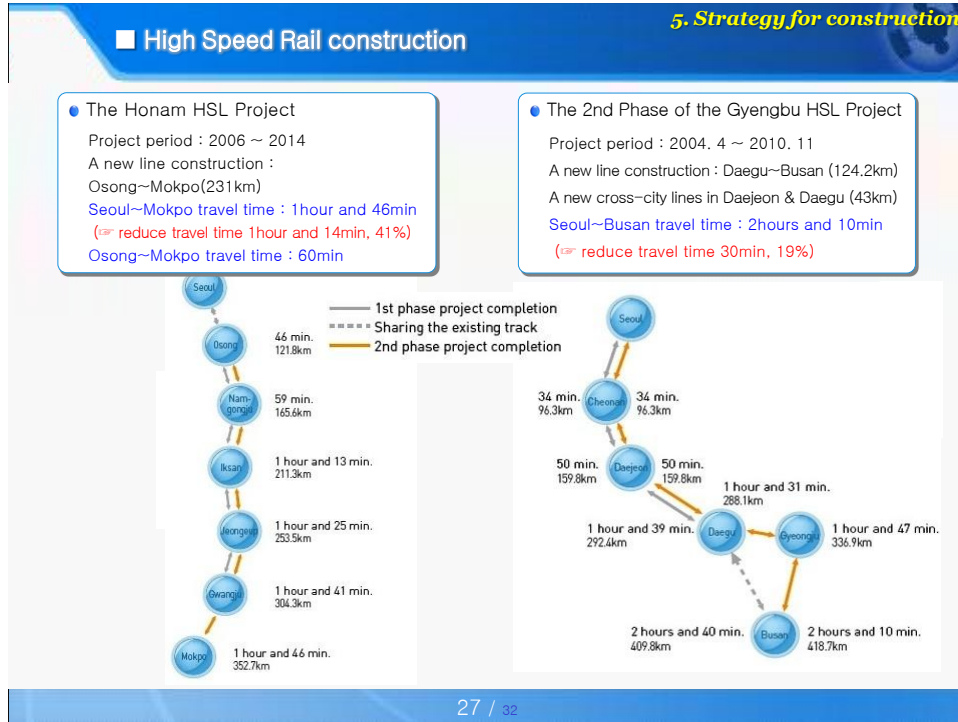
Strategy for construction

Strategic plan for KTX high-speed networks

5. Strategy for construction



- HSR expansion project by 2020
- ✓ HSR expansion connecting major cities
- ✓ Travel time will be reduced to 2 hours or less in anywhere of Korea
- Major strategic plan
- ✓ Enhance maximum speed of conventional line
 - Lines under construction : up to 230km/h
 - Planed lines : up to 250km/h
- ✓ Revitalization of Korail Airport Railroad
 - Direct approach to Incheon airport by KTX
 - Operate high speed subway (180km/h)
- ✓ Development of freight system
 - Introduction of double stack system (capacity 84%↑, freight rates 25%↓)



VI Challenges and key factors

■ Challenges

6. Challenges and key factors

- High speed rail transit is quickly gaining popularity as a key alternative in transportation policy planning.
- The evolution of high speed rail has involved growing partnerships between federal and local transportation authorities.
- This public-private partnership allows funding for various projects, but also helps create economic integration among various regions.
- HSR signals the importance of the environment. However environmental assessments are routinely conducted.
- Legal issues such as environmental protection and land use form an integral part of the discussion on high speed rail

■ Key factors

6. Challenges and key factors

- To solve these challenges, the HSR is an effective alternative to existing transportation schemes
- Key factors that are contributing to this process include :
 - ✓ Market Analysis through feasibility studies
 - ✓ Public-Private partnerships
 - ✓ Increase recognition by transportation planners that existing transportation sectors are overextended
 - ✓ Improving the methodology and criteria in evaluating the feasibility of HSR especially in environmental factors
 - ✓ Changing political attitudes that reflect in alternative transportation legislation

- Thank you -
(Q & A)

