



Crucial Concepts of High Speed Rail

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Crucial Concepts 1:

What is
TTT ?

It's Total Trip Time.



Shortest *Total Trip Time.*



S T T T *model*



Crucial Concepts 1: STTT

Values of 1 minute

- Shortening trip time 1min. in station
- Shortening trip time 1min. for transfer

Values of 1 minute

on board, in station, transfer, first & last one mile, and so on
are all the same

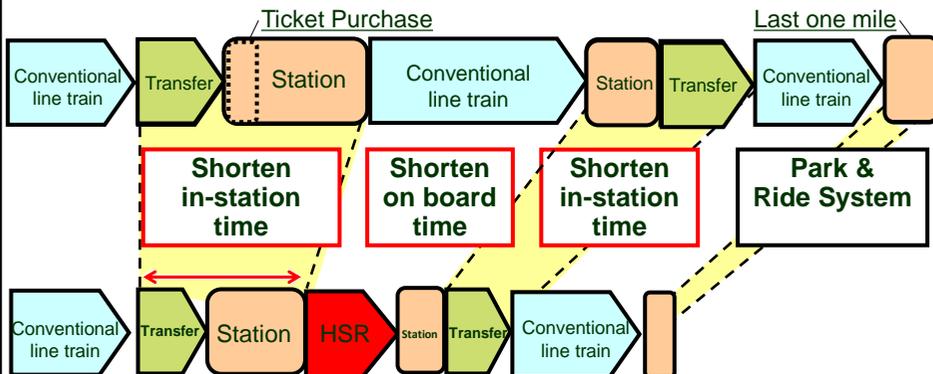
It is important to shorten Total Trip Time from origin to destination.



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Crucial Concepts 1: STTT



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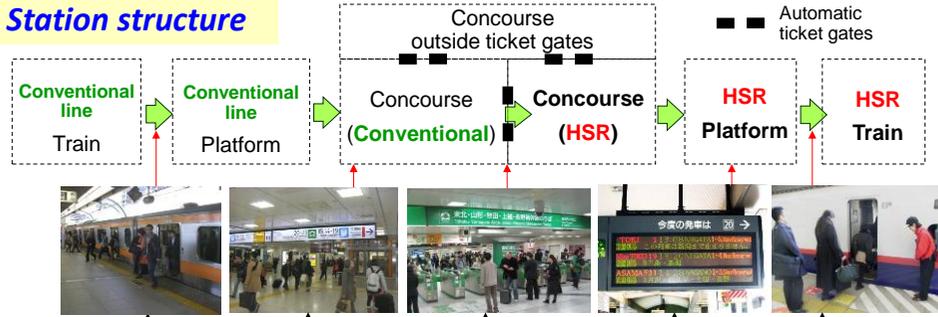
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Crucial Concepts 1: STTT

Passengers are well guided through a station.

Station structure



HSR and other railways : all in the same station

Passenger flow



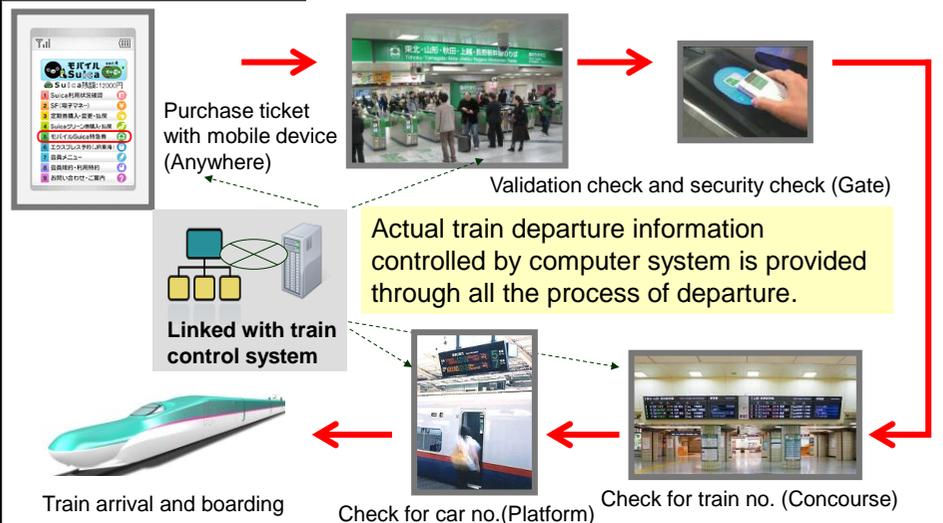
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Crucial Concepts 1: STTT

Example in Japan

Boarding system to shorten the in-station time



Turn up yourself on the platform 2 min. before departure.

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Crucial Concepts 2: Through operation



High Speed



Through Service

Maximum commercial speed :200mph (320km/h)

Series E5 & E6 can be coupled and uncoupled automatically.

Series E6 run through onto conventional lines.

Series E5

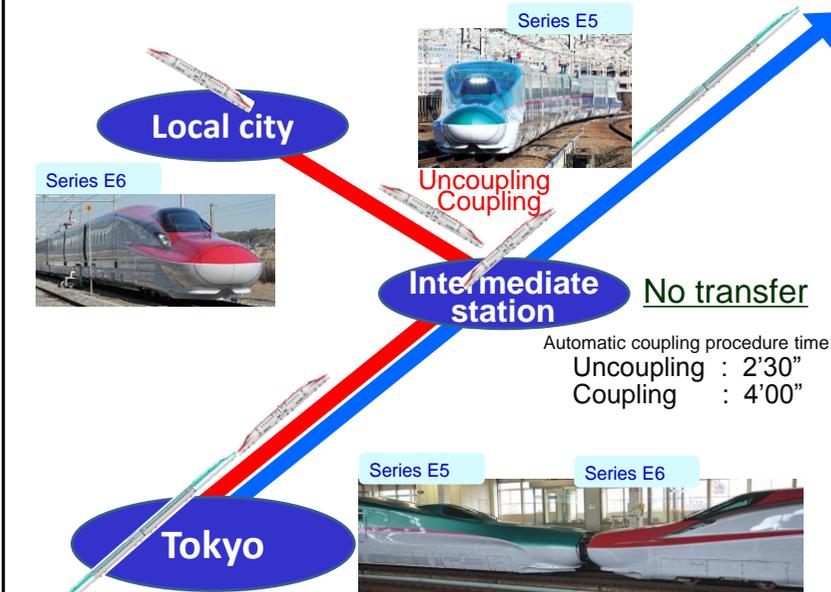
Series E6



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Crucial Concepts 2: Through operation



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Crucial Concepts 3: Safety and Punctuality

- ▶ **Safety is the top priority for PT management**
(JR East has kept it and will keep it)
- ▶ **Punctuality is the mother for everything**
 - 1) reliance by passengers and society
 - 2) competitiveness against other modes of transport
 - 3) efficient operation requiring less infrastructure and rolling stock
 - 4) reduced operation cost



Crucial Concepts 3: Safety and Punctuality

In order to improve punctuality, an excellent operation plan, train schedule diagram, train control, maintenance, human resources, and so on are required.



Crucial Concepts 4:

What is
TLCC?

It's Total Life Cycle Cost.



Lowest Total Life Cycle Cost.



LTLCC model



Crucial Concepts 4: LTLCC (Low OPEX & CAPEX)

Shinkansen technology and experience can minimize the need for facilities, rolling stock, and operating personnel.

OPEX: 1) Efficient Operation

Punctuality, Train schedule, Train control, Short Turn-around at station, and so on.

2) Efficient Maintenance

Rolling stock, Track, Overhead catenary, Signaling, and so on.

Higher efficiency



needs only

CAPEX: 1) Minimum Infrastructure

2) Minimum Rolling Stock

CAPEX will be saved as well!

Needs high efficiency of O&M



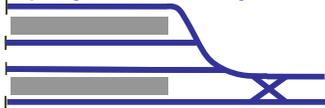
Crucial Concepts 4: LTLCC (Low OPEX & CAPEX)

Quick 12-minute turnaround at the terminal station can



✓ provide very frequent service with minimum rolling stock
 4 minute headways = high frequency => Minimum rolling stock (CAPEX)
 415 trains per day in peak season

✓ simplify station layout and infrastructure



only 2 platforms with 4 tracks

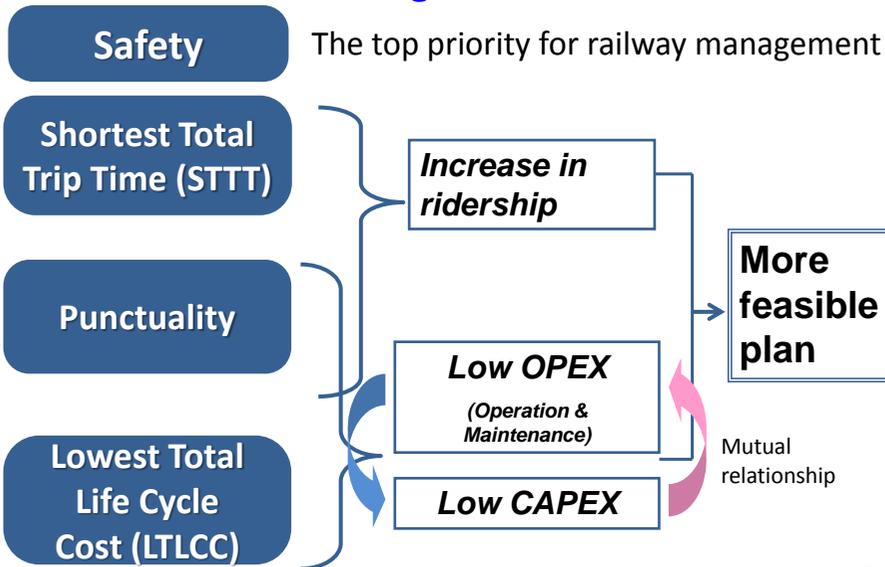
=> Minimum infrastructure(CAPEX)



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Crucial Concepts 4: LTLCC (Low OPEX & CAPEX)

Essence of HSR management



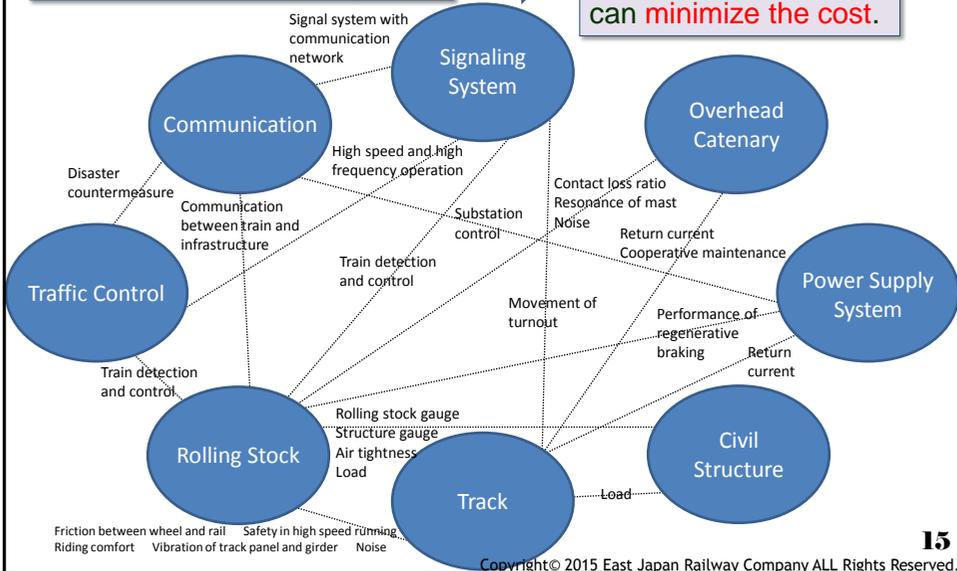
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Crucial Concepts 5: Design of System Integrity

Lots of interfaces among E&M



The best interfaces can minimize the cost.

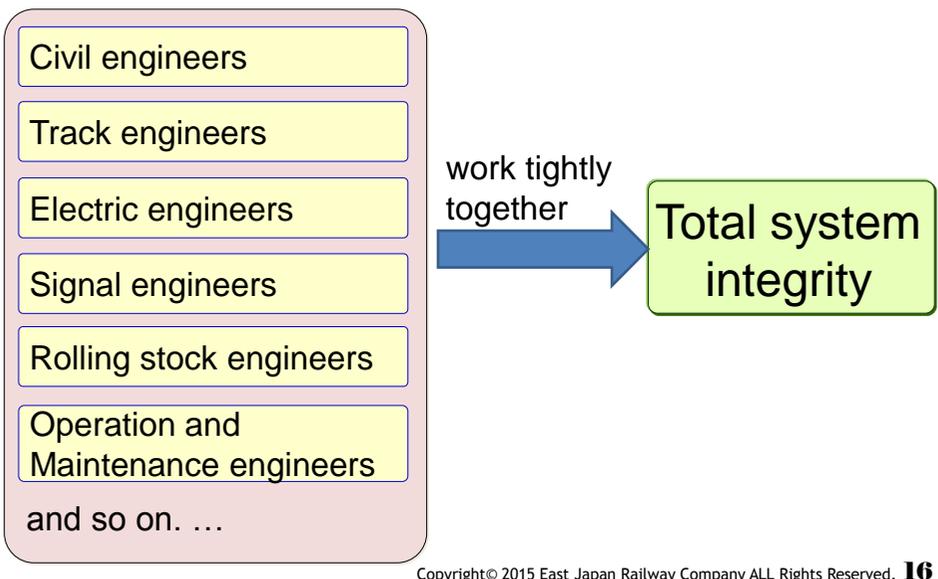


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Crucial Concepts 5: Design of System Integrity

From the planning stage of HSR,



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*Thank you very much
for your attention*

