A Study of IC Card Systems within Japanese Urban Railway Lines

– Considering the Integration of Transportation Services -

Institute of Transportation Economics

(Presenter) Fumio KUROSAKI Ph.D.
Shosaku HIGASHINO

Outline of the Presentation

1) Introduction

2) Outline of Japanese Urban Railways

3) IC Card Systems within Japanese Passenger Railways

4) A Comparative Study: The IC Card Systems in Singapore

5) Discussions and Conclusions

Introduction

Background

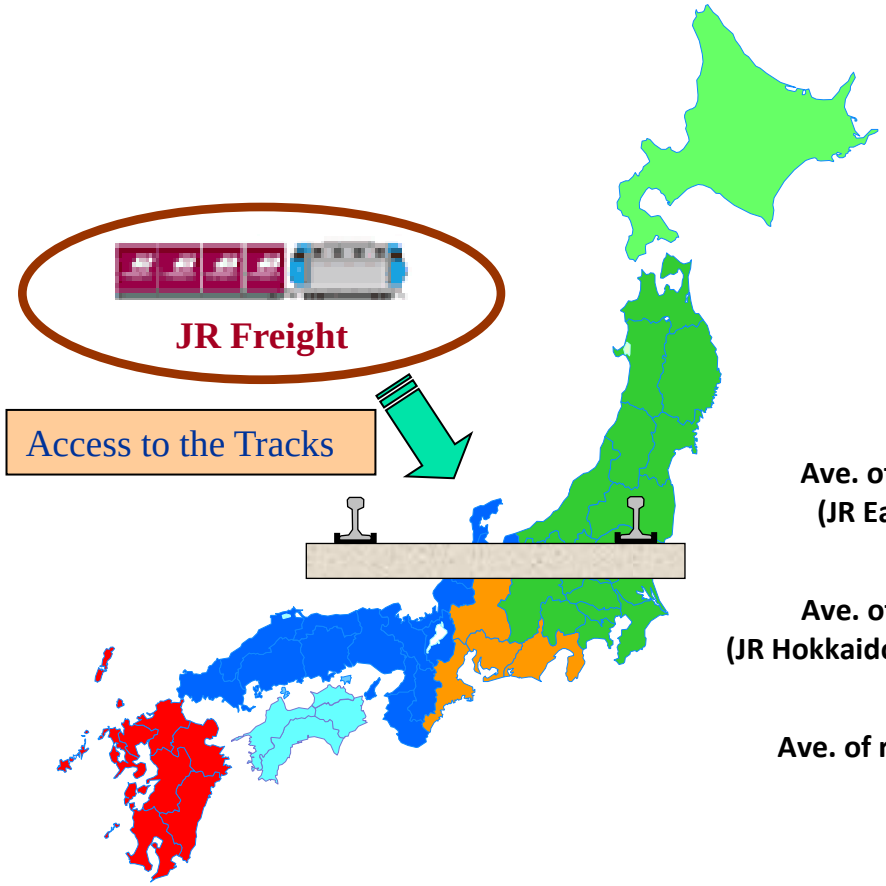
1) So far, 47 IC card systems have been introduced by independent railways in Japan.
2) Passengers can travel in different areas by using one of the major IC cards.
3) As such, the outline of IC card systems in Japan has become complex.

Aim of Research

The study aims to clarify the followings.

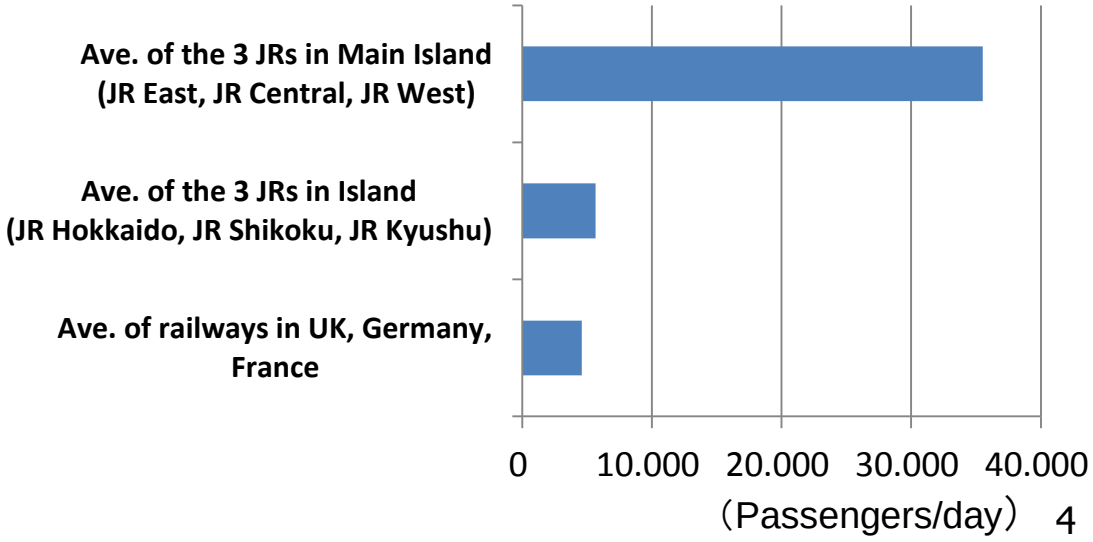
1) The development and current status of IC card systems in Japan.
2) How each railway company does fare transactions utilising an IC card system.
3) How different railway companies collaborate in fare transactions.

JNR Reform in 1987



JNR was divided into 6 regional passenger railway companies and a single nation-wide freight company.

Passenger Traffic Density in FY 1987



3 Types of Railways in Metropolitan Areas in Japan

1）JR Lines　2）Metros　3）Private Railways

- Metropolitan areas in Japan have several types of railway operators, such as JR, Metros and private railways.
- These railways have been promoting independent businesses.
  (They own infrastructure and provide transport services without subsidies.)

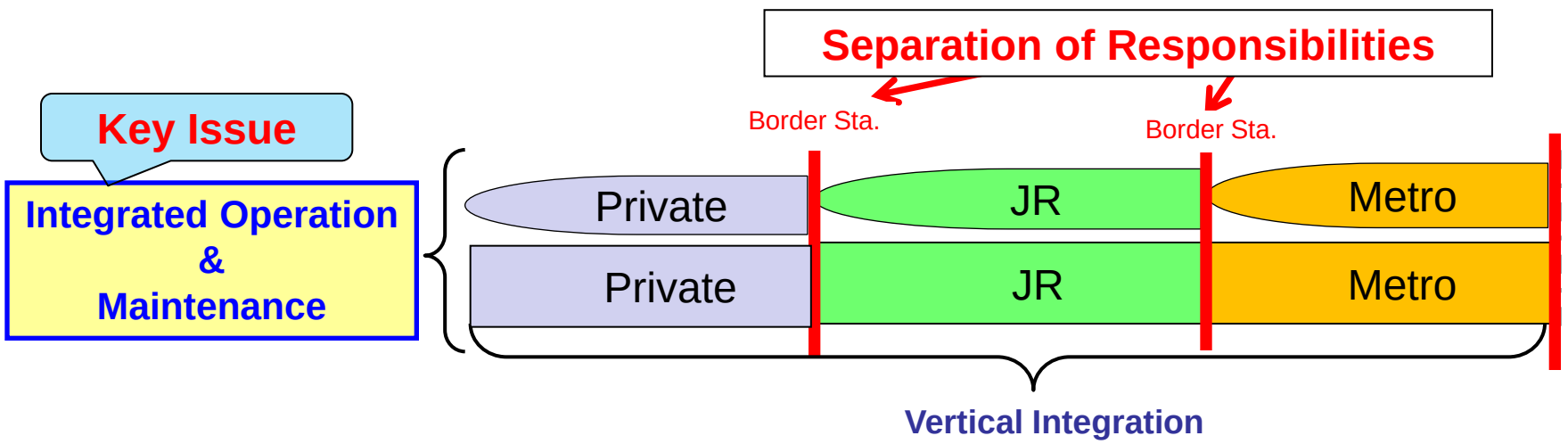
Passenger Through-train Services in Japan

A Principle of Railway Operation in Japan:

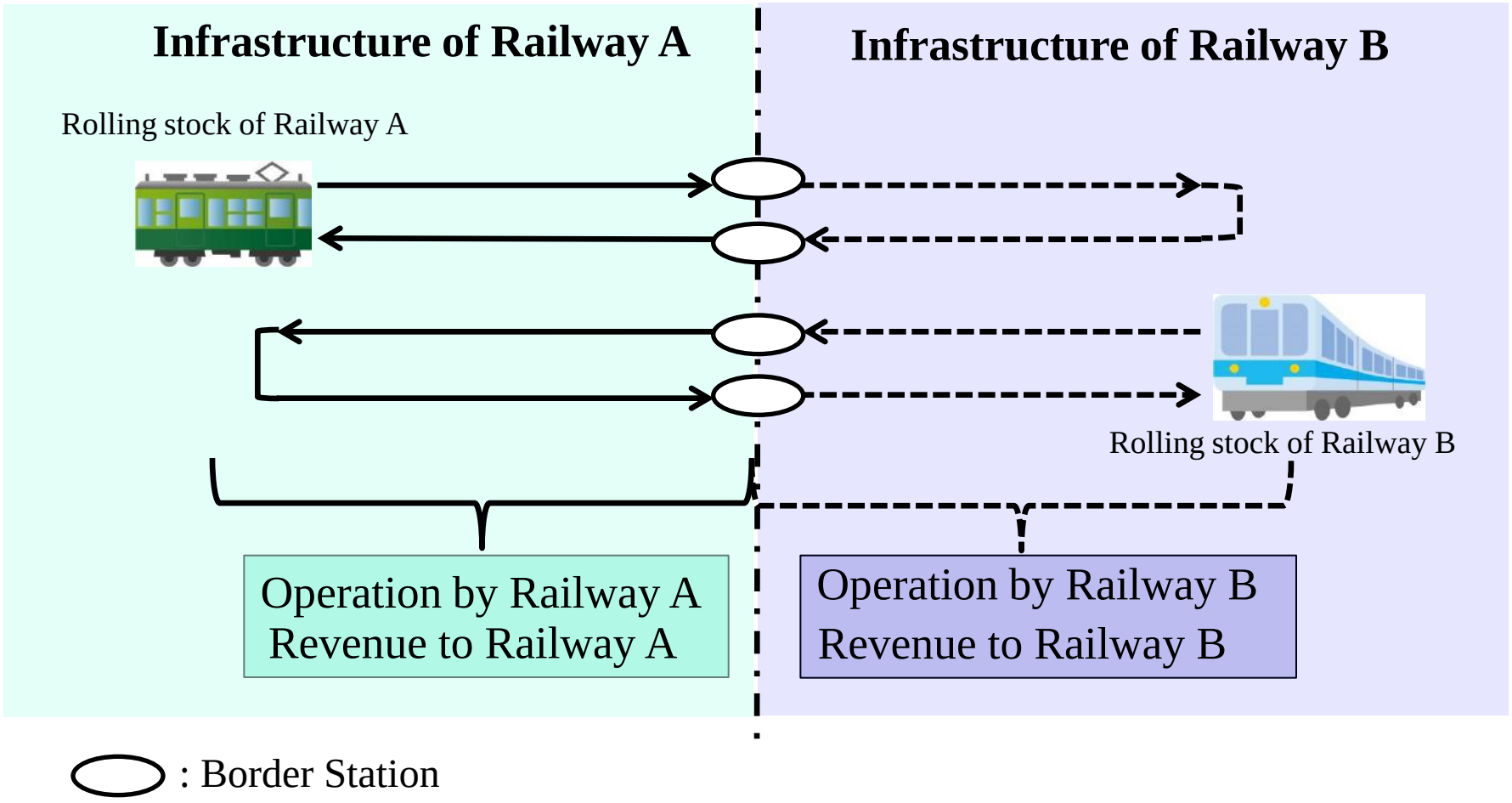
Separation of responsibilities at the border station

This principle is applied to all the passenger through–services in Japan such as:
1) JR & Metro ; 2) Metro & Private ; 3) Private & Private ; 4) Other cases

The railway companies do not receive annual subsidies.



Passenger Through-train Services in Japan



Outline of Japanese Urban Railways

Shift of responsibility for train operation

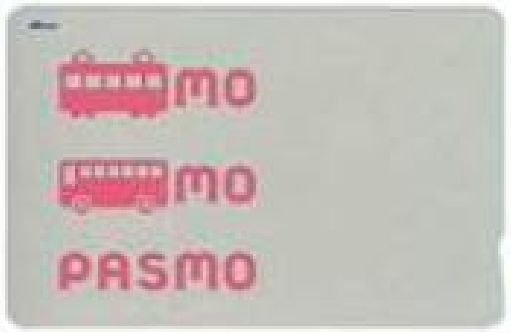
Operation by a single operator

Introduction of IC Card Systems

From early 2000s, several railways started to change tickets from magnetic cards to IC cards for several advantages such as
1) expansion of business opportunities, 2) rationalisation of the works, 3) minimisation of the costs and 4) other advantages.

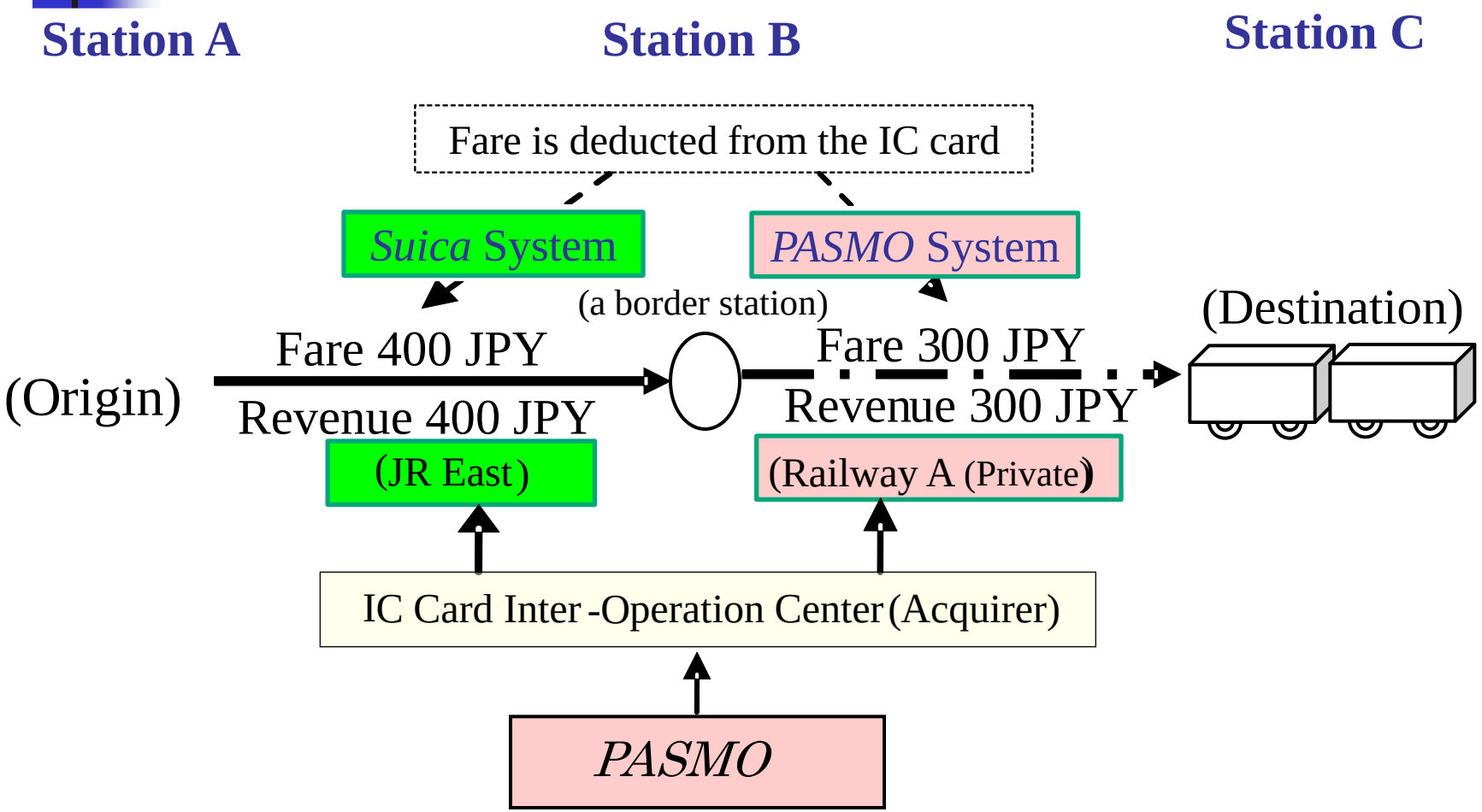
Since different railways have issued IC card systems independently, there are now 47 IC card systems in Japan.

Suica Card (JR East)

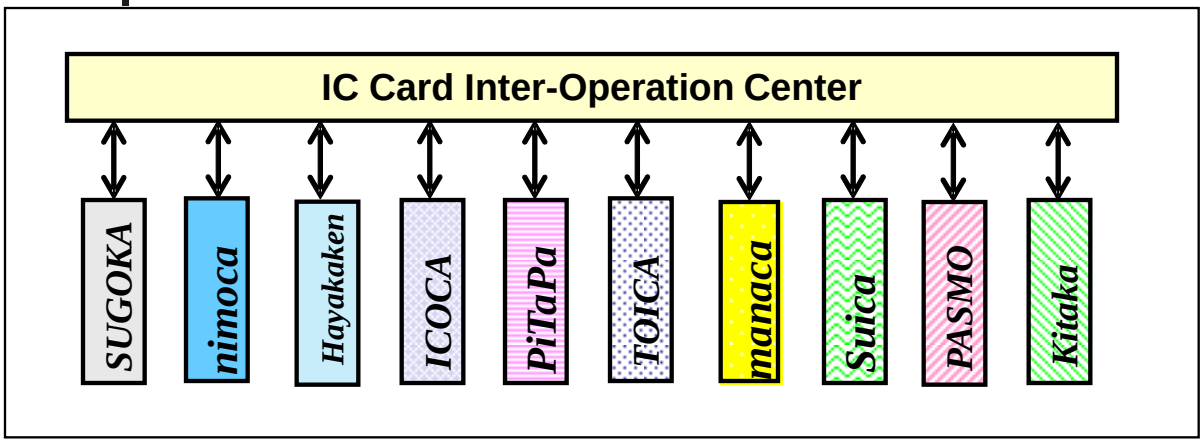


Pasmo Card (Private Railways in Tokyo)

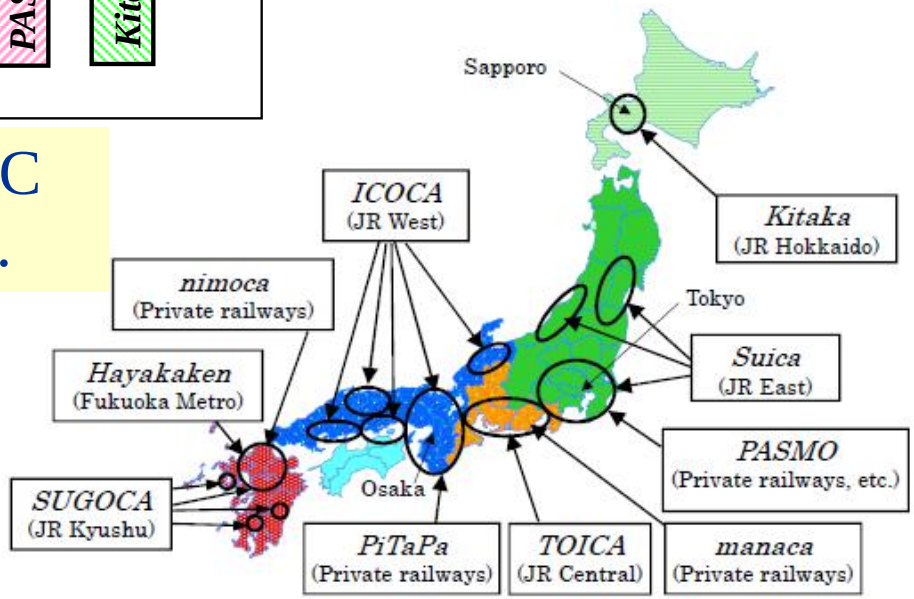
Fare transactions for through-train services



Inter-Operation among the 10 Major IC Cards



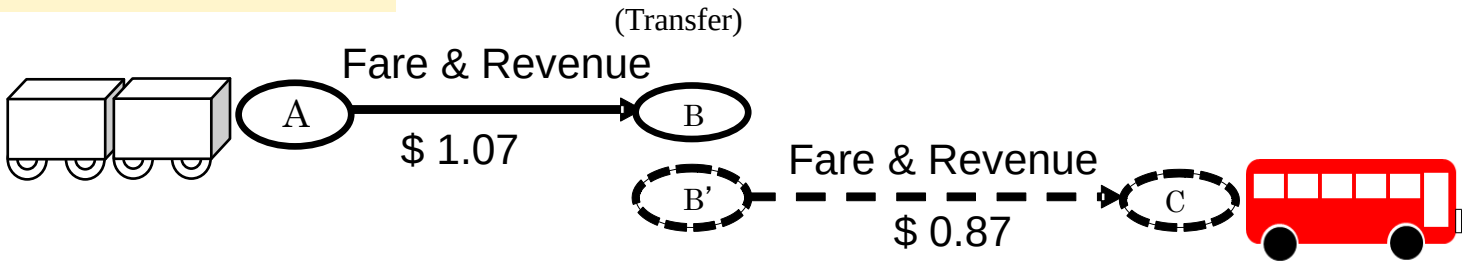
Inter-operation among 10 major IC card systems started in March 2013.



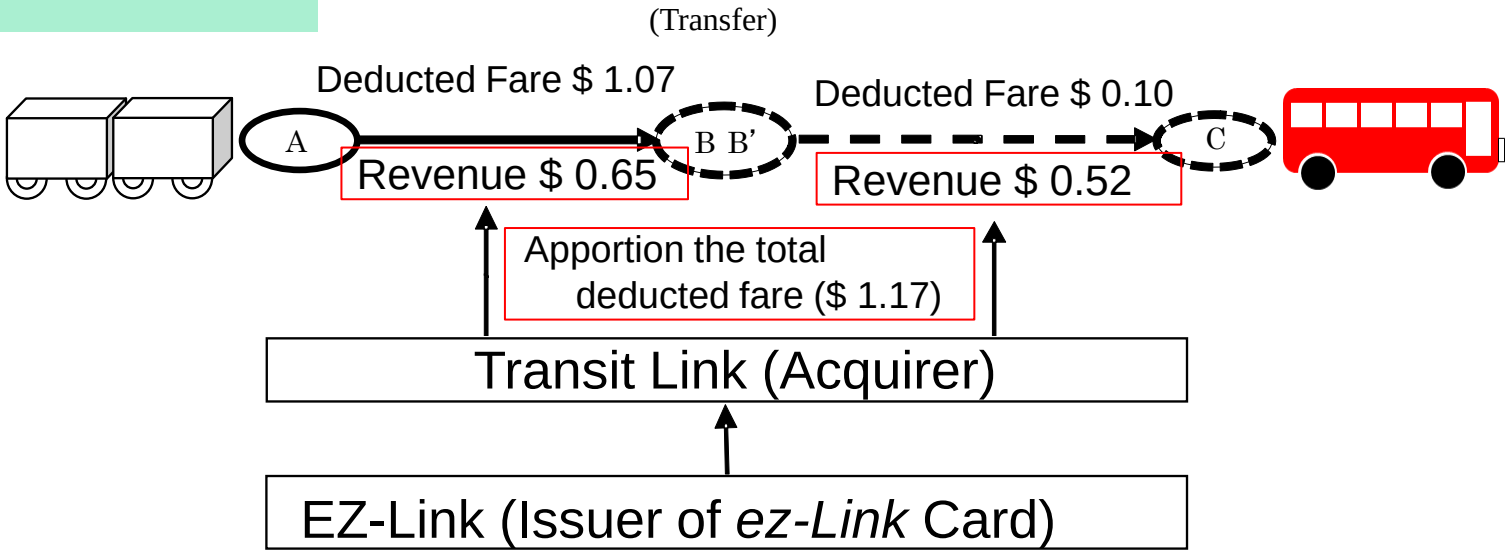
Legend: *Upper*: Name of the IC card
(Lower): Representative issuer

Fare Transactions in Singapore (1)

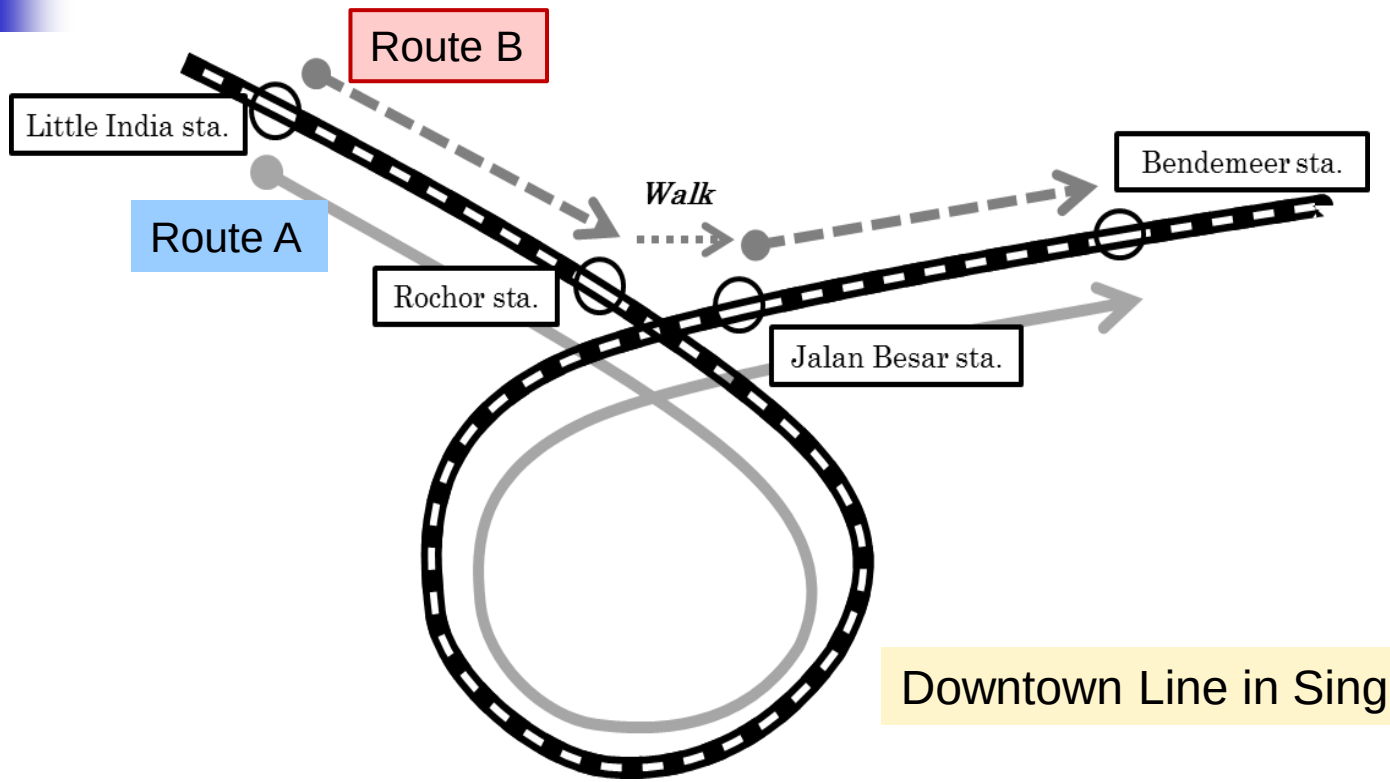
Traditional Rules



Revised Rules



Fare Transactions in Singapore (2)



Downtown Line in Singapore

Route A	7.0 km	20 min	$1.16
Route B	1.8 km	15 min	$0.77+$0.77 ⇒ (New rule) $0.77

Discussions

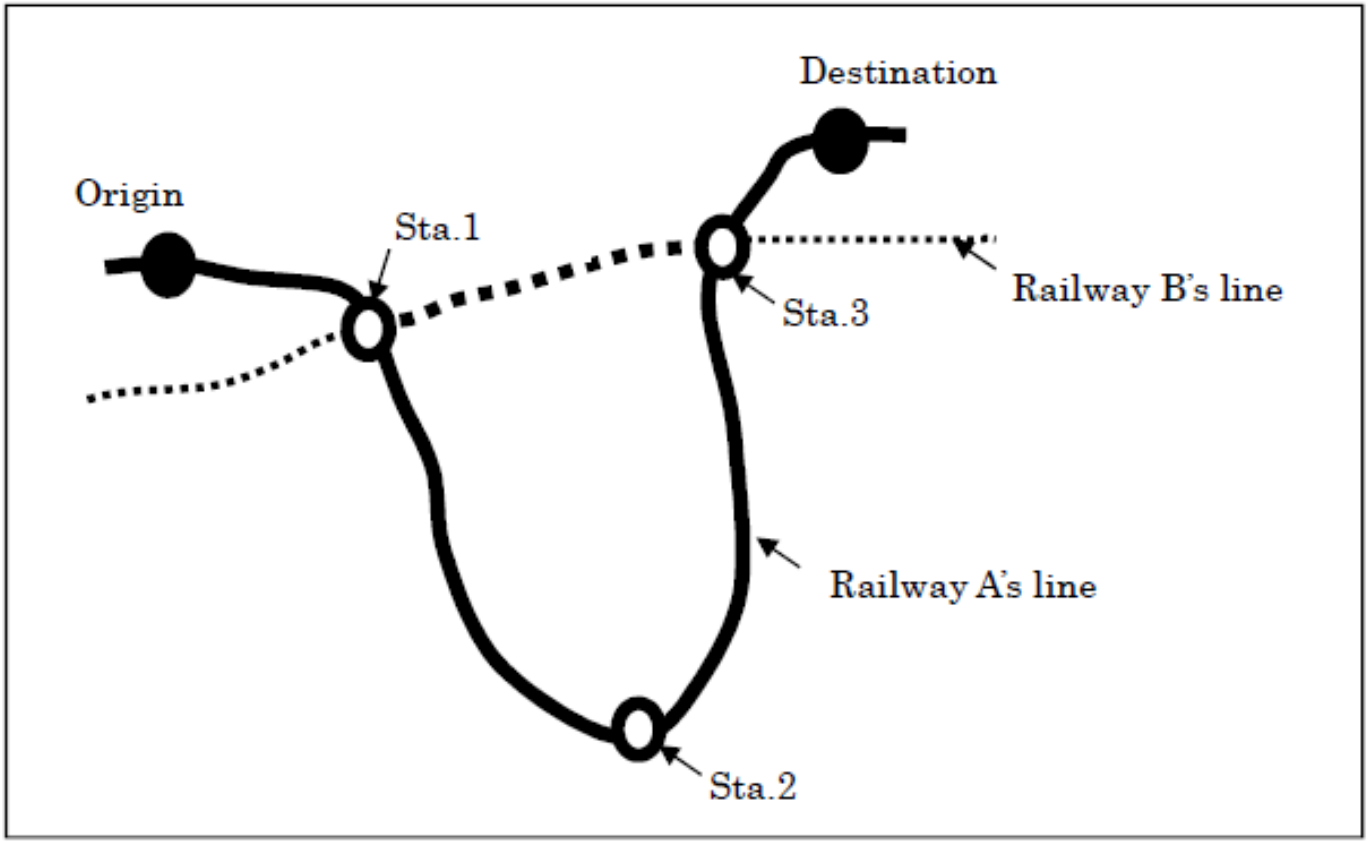


Figure: Combined Networks in a Metropolitan Area in Japan

Conclusions

Besides attaining the aims, the study showed useful examples:

1) The private sector could improve railway operation under the present rules in Japan.
2) The public sector could attain it by introducing the new rules in Singapore.

In both cases, introduction and utilisation of IC card systems contributed to the improvement by and large.

Thank you for your attention

For this study, the authors have undertaken interviews to PASMO (Japan) and Public Transportation Council (Singapore) and received valuable information. We hereby acknowledge their contribution.

Institute of Transportation Economics

Fumio KUROSAKI, Ph.D.

E-mail: FumioKurosaki@itej.or.jp

Shosaku HIGASHINO

E-mail: ShosakuHigashino@itej.or.jp