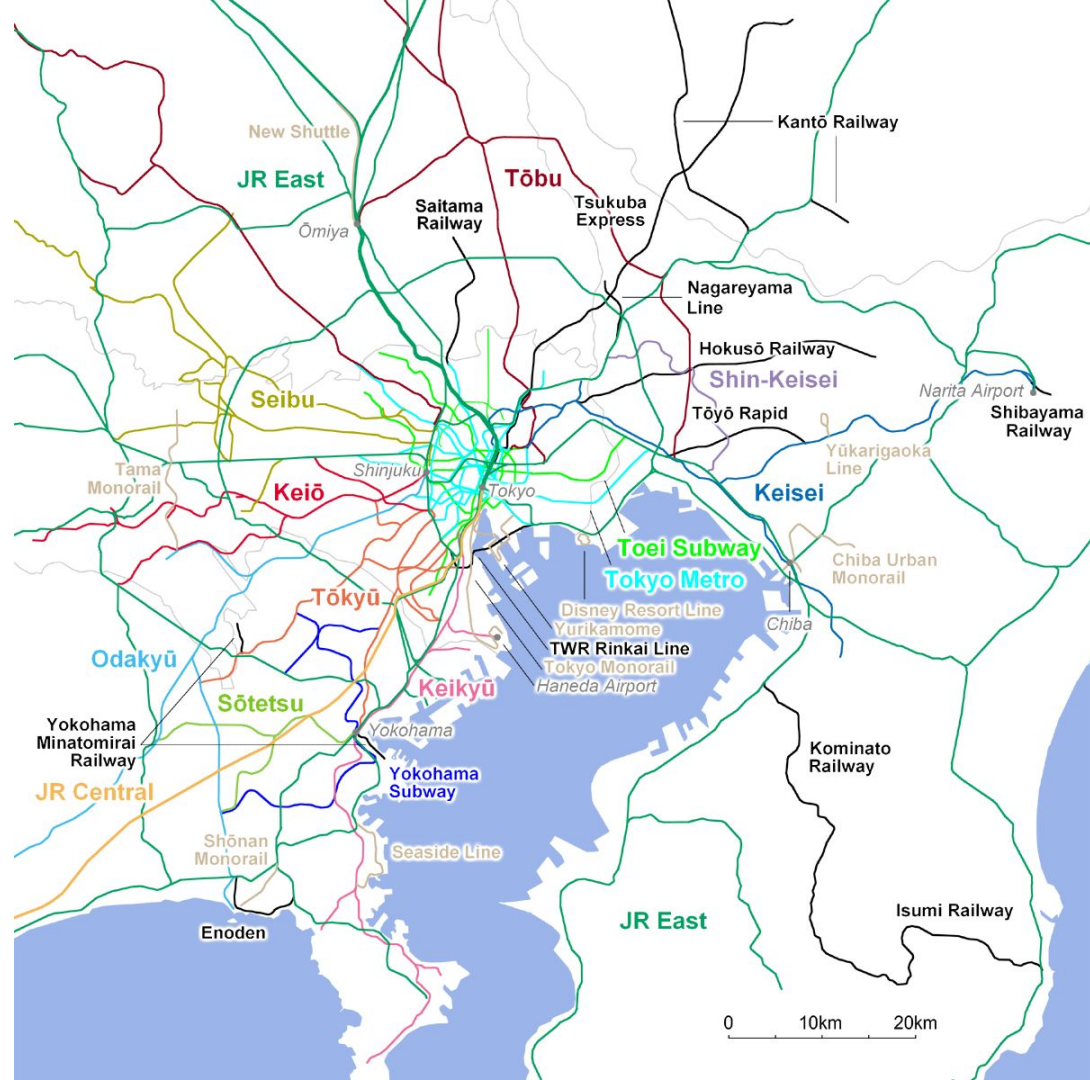




Rail Transit in Greater Tokyo

Systems and Operations



Statistics

- 40 million passengers per day
 - 48% commuter mode share
- 6,023.9 km of track
 - 30x bigger than BART
- ~900 stations
 - One station for every 1.6mi² of land
- ~30 operators and 120 lines
- 5 out of the 10 busiest train stations in the world are in Tokyo



Major Operators

Operator	Number of Lines	Daily Ridership (Approx.)
JR East	~36 Lines	14.1 million
Tokyo Metro	9 Lines	6.84 million
Toei Subway	4 Lines	2.85 million
Tokyu Railways	8 Lines	2.65 million
Tobu Railway	12 Lines	2.24 million
Odakyu Electric Railway	3 Lines	1.93 million
Keio Corporation	6 Lines	1.62 million
Seibu Railway	12 Lines	1.58 million

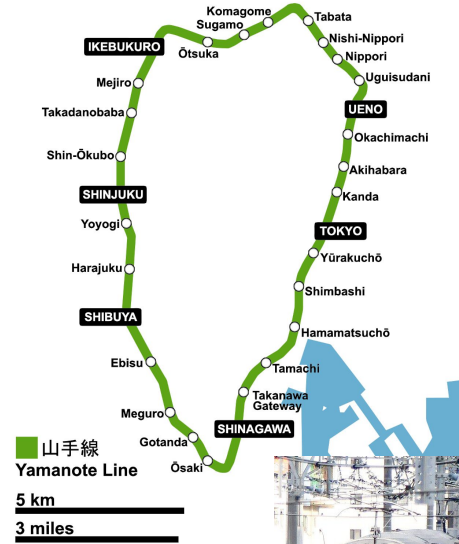
Service Types

- Local, Rapid, Express, Limited Express
- Direct through service
 - High integration
 - Important!!
- Sightseeing



The Yamanote Line

- Busiest railway line in the world
 - 3-4 million passengers per day
 - 2 minute headways at peak hours
- 100% of land enclosed is within 10 minutes walking of a train station
- Serves the 3 busiest train stations in the world on one line
- Distinctive colorway



Funding and Profitability

Zoning Law

USE	Zone					
	A	B	C	D	E	F
Residential	O	O	O	O	O	O
School	X	O	O	O	O	O
Neighborhood stores	X	X	O	O	O	O
Commercial	X	X	X	O	O	O
Big box commercial surface	X	X	X	X	O	O
Industrial	X	X	X	X	X	O

USE	Zone					
	A	B	C	D	E	F
Residential	O	X	X	X	X	X
School	X	O	X	X	X	X
Neighborhood stores	X	X	O	X	X	X
Commercial	X	X	X	O	X	X
Big box commercial surface	X	X	X	X	O	X
Industrial	X	X	X	X	X	O





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TOKYU



カラオケ JOYSOUND
ココロの ボリューム あけていこう JOYSOUND



Operating Revenues

JR East

- Fares: 68%
- Real Estate, Hotels: 15%
- Retail & Services: 14%
- Other: 3%

Tokyu Corporation

- Real Estate: 46%
- Fares: 22%
- Hospitality: 19%
- Retail & Services: 13%

Tokyo Metro

- Fares: 83%
- Real Estate, Retail: 13%

Rolling Stock and Technologies

A Mess

System/Lines	Track Gauge	Electrification
JR, New Tokyo Metro, Tokyu, Tobu, Odakyu, Seibu, most independent systems (Saitama, Minatomirai)	1,067 mm (Narrow)	1,500 V DC Overhead
Keio, Toei Shinjuku	1,372 mm (Scotch)	1,500 V DC Overhead
Toei Asakusa and Oedo, Keisei, Keikyu	1,435 mm (Standard)	1,500 V DC Overhead
Old Tokyo Metro	1,435 mm (Standard)	600 V DC Third Rail
Toden Arakawa, Setagaya	1,372 mm (Scotch)	600 V DC Overhead
Yokohama Municipal Subway	1,435 mm (Standard)	750 V DC Third Rail (Blue), 1,500 V DC Overhead
JR East Joban, TX Tsukuba	1,067 mm (Narrow)	1,500 V DC but also 25 kV AC on some sections

Infrastructure Sharing

- Tracks are shared by operators, lines, and services
- Trains may carry multiple ATC and signalling systems
- Dual gauge tracks
- Multi-voltage/electrification switching
 - Fascinating study on cost optimization
- Fares are standardized



Large Variety



Very Large Variety



Tokyo Metro 05
series



Tokyo Metro 05N
series



Tokyo Metro 07
series



Tokyo Metro 15000
series



Toyo Rapid 2000
series



JR East E231-800
series

(Current) Tozai Line Rolling Stock

Gadgetbahns



Other Cool Stuff

FeliCa

- Proprietary NFC standard by Sony
- Universal prepaid payment system for transit across Japan
 - Also available for nearly every non-transit payment
- First used on the MTR (Octopus) in 1997



Fare Gates

- Fast! 0.1 second processing time
- Only closes when ticket scan fails
- Enables high throughput (>60 passengers/minute)
- More cool stuff coming??



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