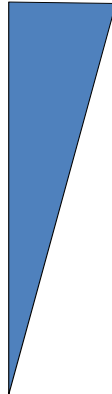
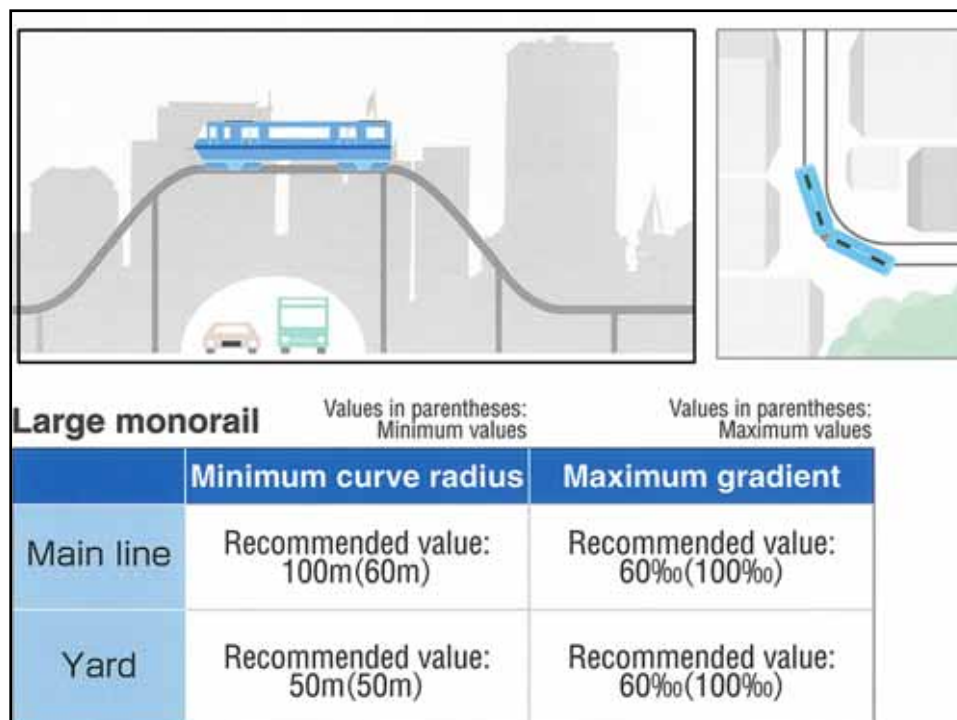
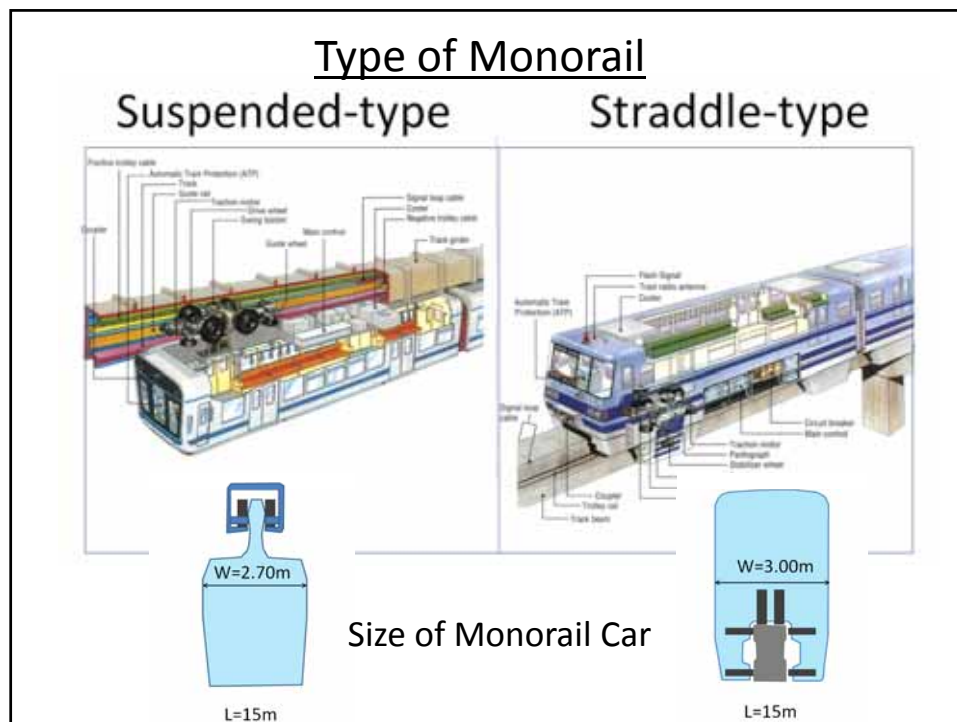


### Characteristics of Urban Transportation System

Urban Transportation System	Capacity	Introduction space	Tires
Urban Railway	 Large	Ground, Under Ground, Elevated	Steel
Subway		Under Ground	Steel
<b>Monorail (straddle) (suspended)</b>		<b>Elevated</b>	<b>Rubber</b>
Automated Guideway Transit		Elevated	Rubber
Tram, Streetcar, LRT		Ground	Steel
BRT, Guideway Bus		Elevated	Rubber
Bus		Ground	Rubber
	Small		

2





### Safety

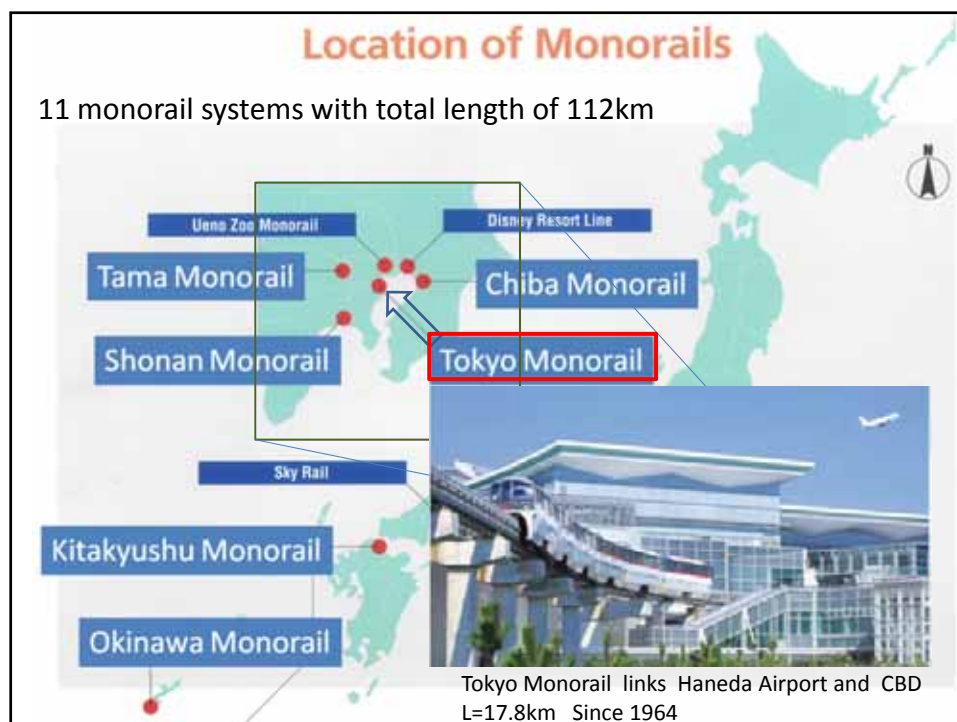
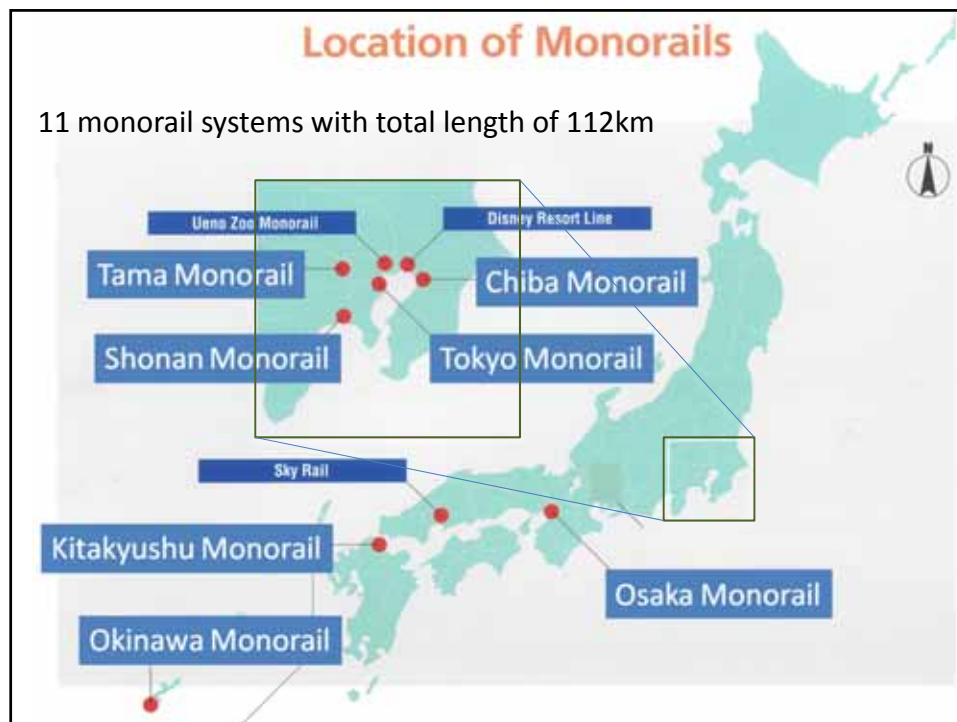
No operational accidents resulting in injury or death.

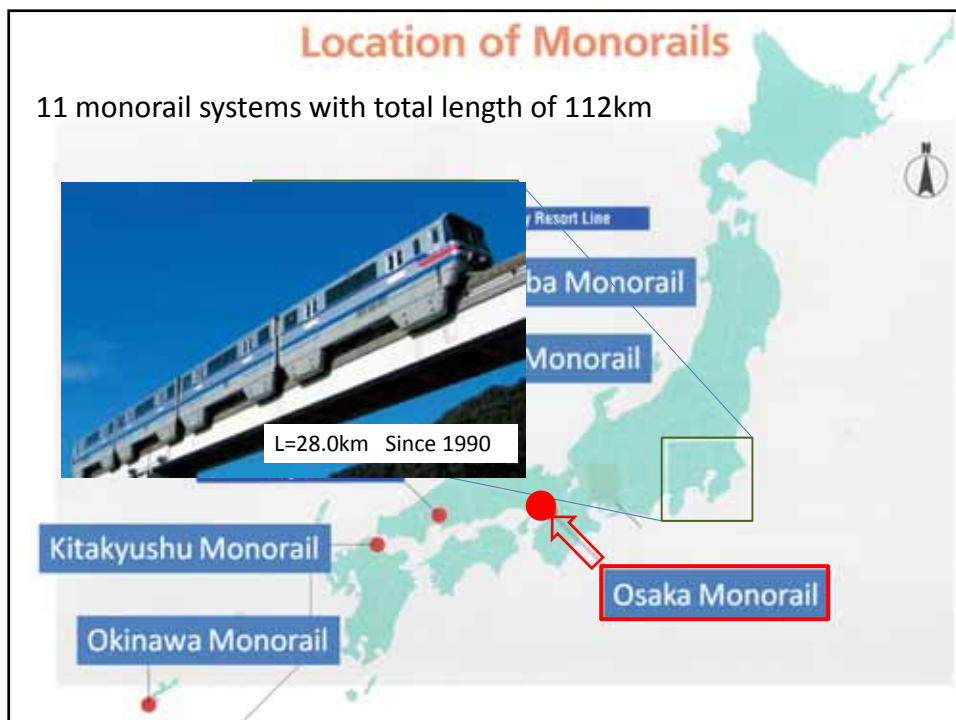
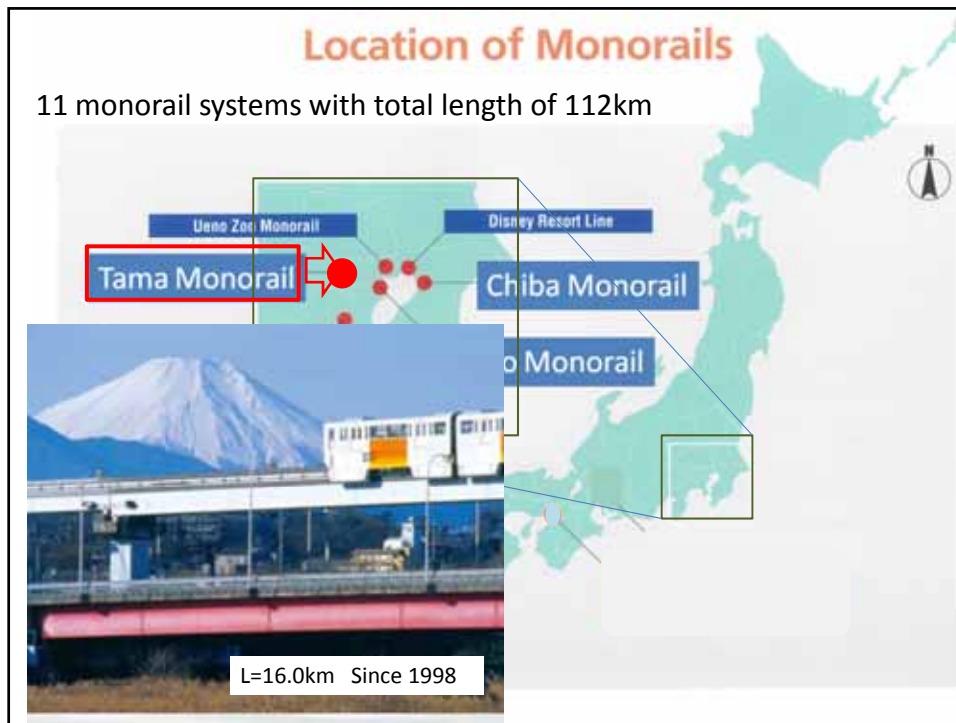
### Construction Cost

Monorail < Subway

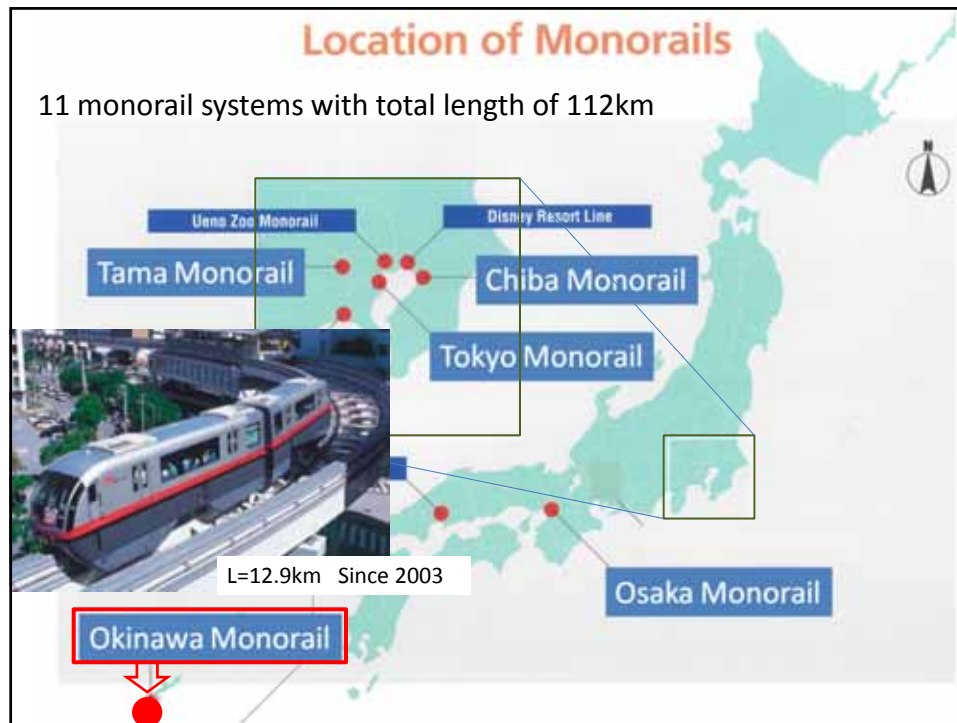
### Operation Cost

Monorail  $\doteq$  Subway





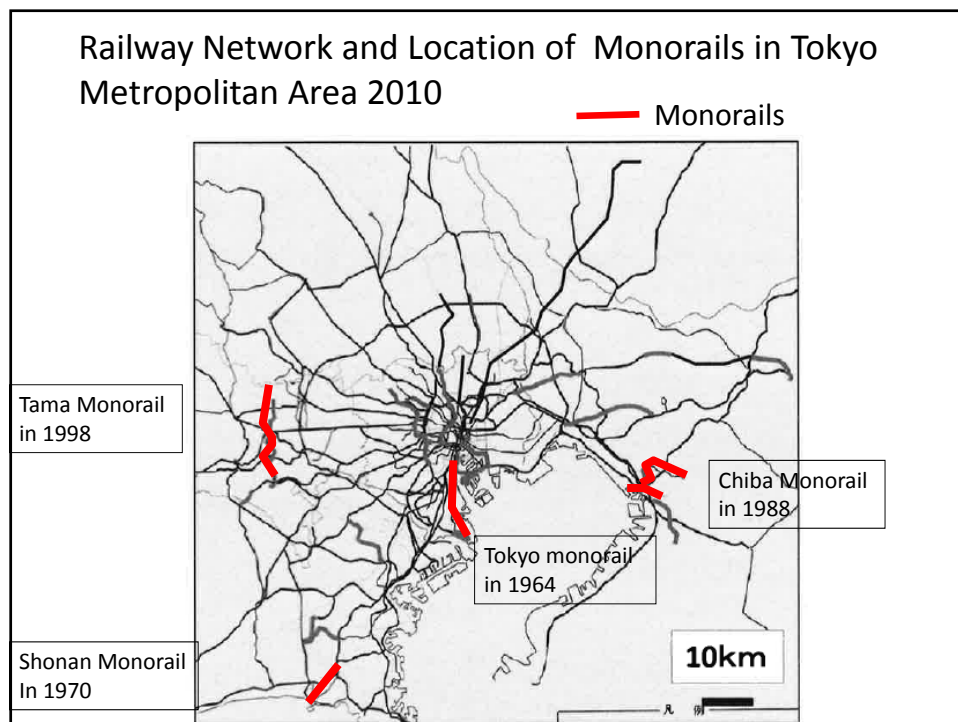
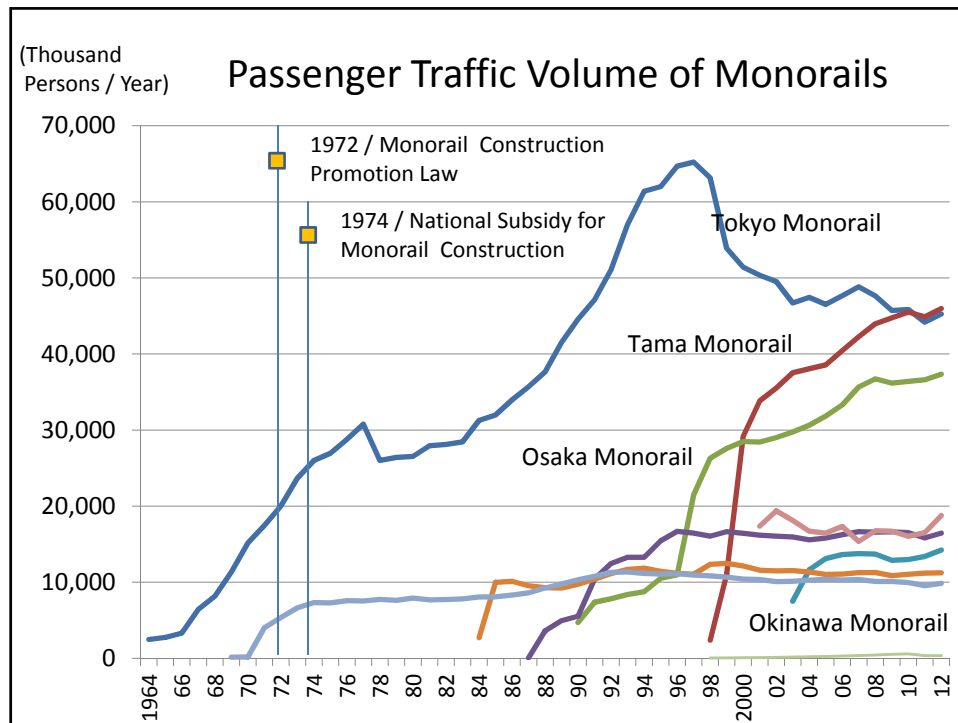




## Features of Major Monorail Systems in Japan

2013.3.31

Name	Tokyo Monorail	Tama Monorail	Osaka Monorail	Kita-kyushu Monorail	Okinawa Monorail	Chiba Monorail	Shonan Monorail
Operating Body	Private	Semi-Public	Semi-Public	Semi-Public	Semi-Public	Semi-Public	Private
Line Length (km)	17.8	16.0	28.0	8.8	12.9	15.2	6.6
Operating Years	48	14	23	28	10	25	43
Type	Straddle	Straddle	Straddle	Straddle	Straddle	Suspended	Suspended
Nominal Capacity (persons / car)	94 / 96 / 99 / 102 /	98 / 99 / 108	99 / 108	93 / 103	82 / 83	78 / 79 / 85	61 / 71 / 82
Number of Cars per Train	6	4	4	4	2	2	3
Passenger Volume (persons / day)	124,000	126,000	102,300	30,800	39,100	45,100	27,000



## Railway Network in Tokyo around 1950



Railway network in 1950  
of Tokyo Metropolitan Area



Streetcar (Tram) network  
in 1961 in Tokyo CBD Area

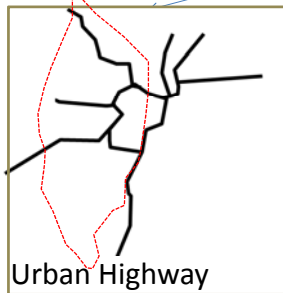
Streetcar network  
in Tokyo CBD  
in 1961



Road Traffic Congestion

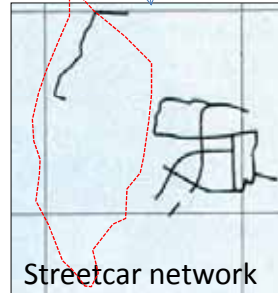


Over Streets



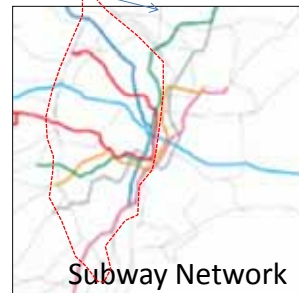
Urban Highway  
Network in 1973

On Streets



Streetcar network  
in 1971

Under Streets

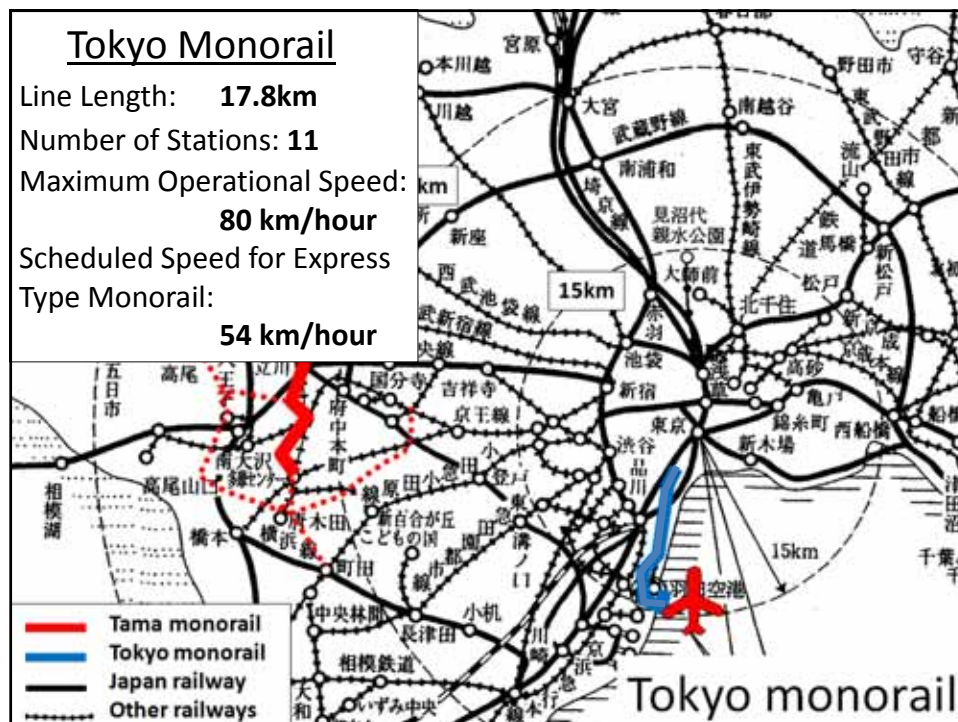


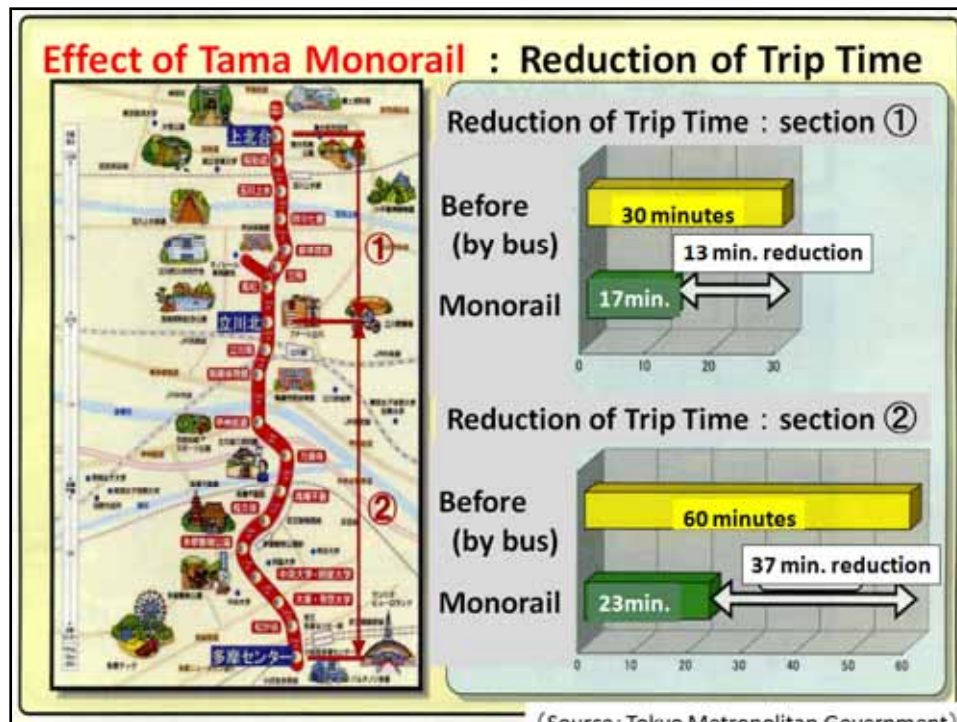
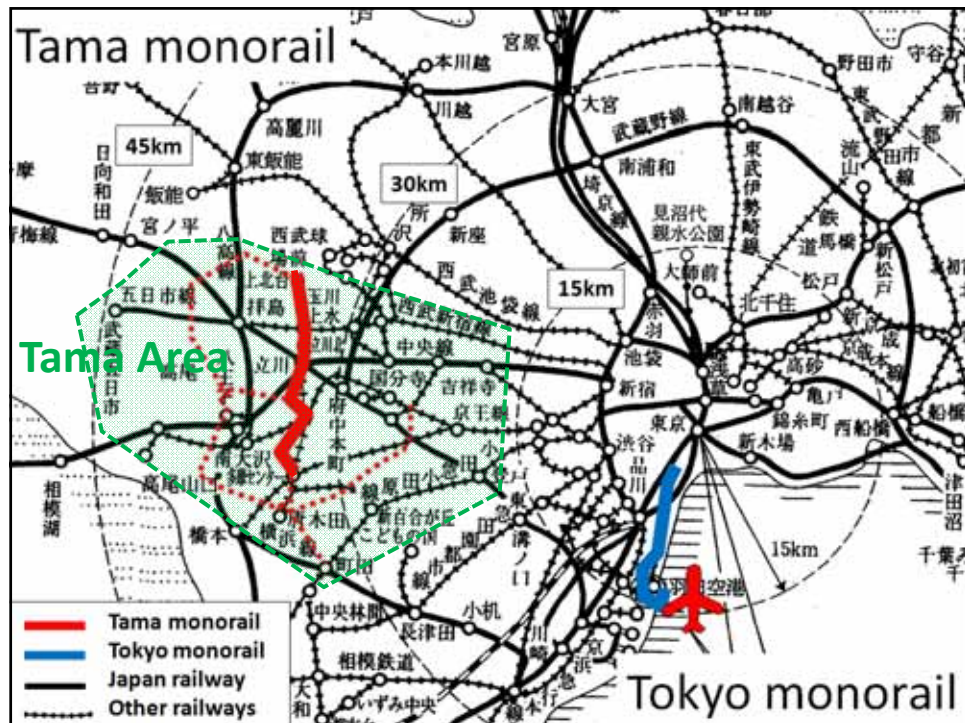
Subway Network  
in 1973

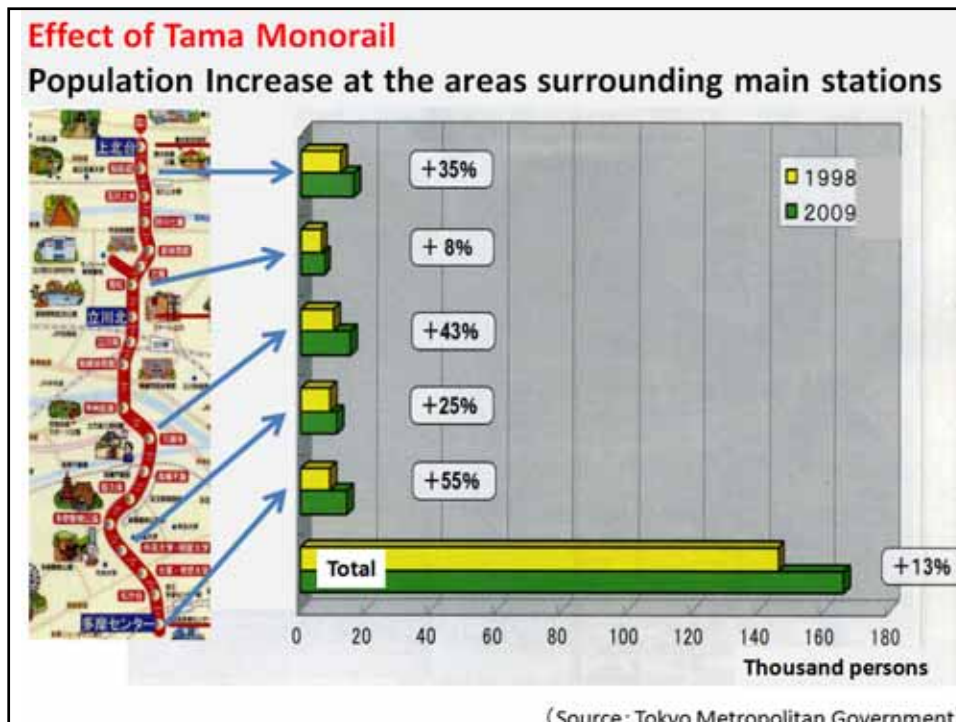
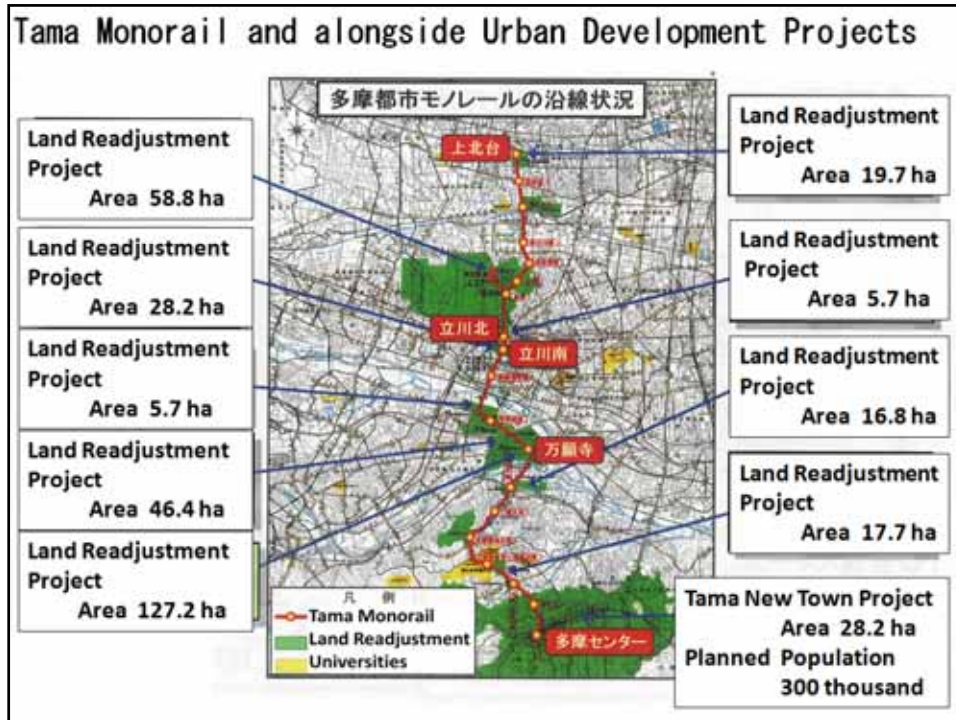


## Practical Use of Monorail Systems in Metropolitan Area

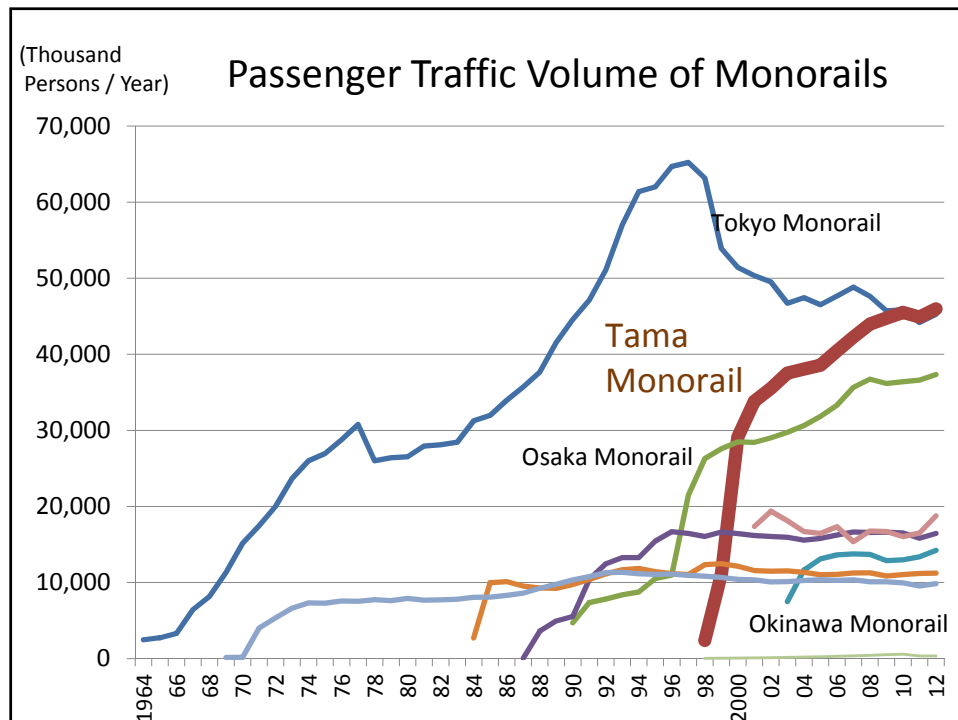
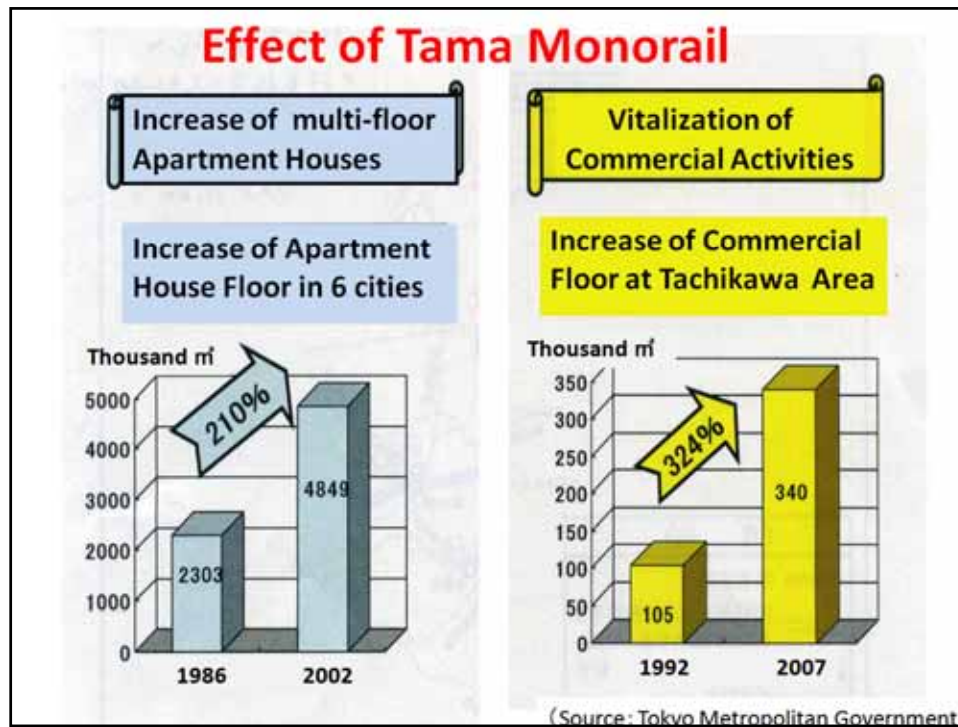
- Creation of new railway network by linking existing railways
- Access to existing railway
- Access to Airport
- Access to Development Area  
(Urban development integrated with Monorail Construction)

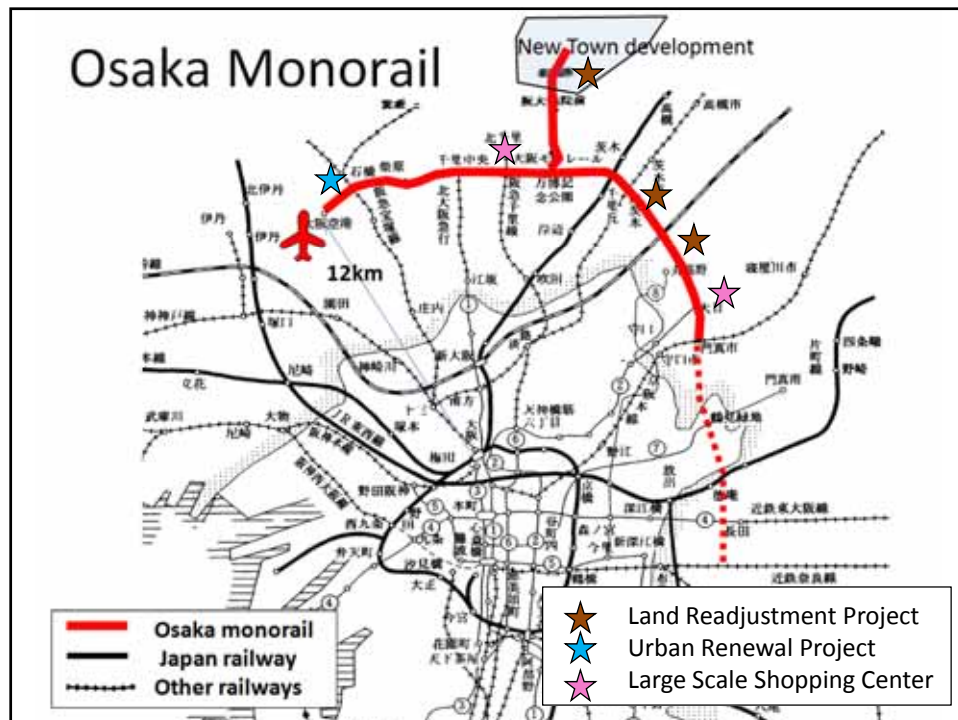
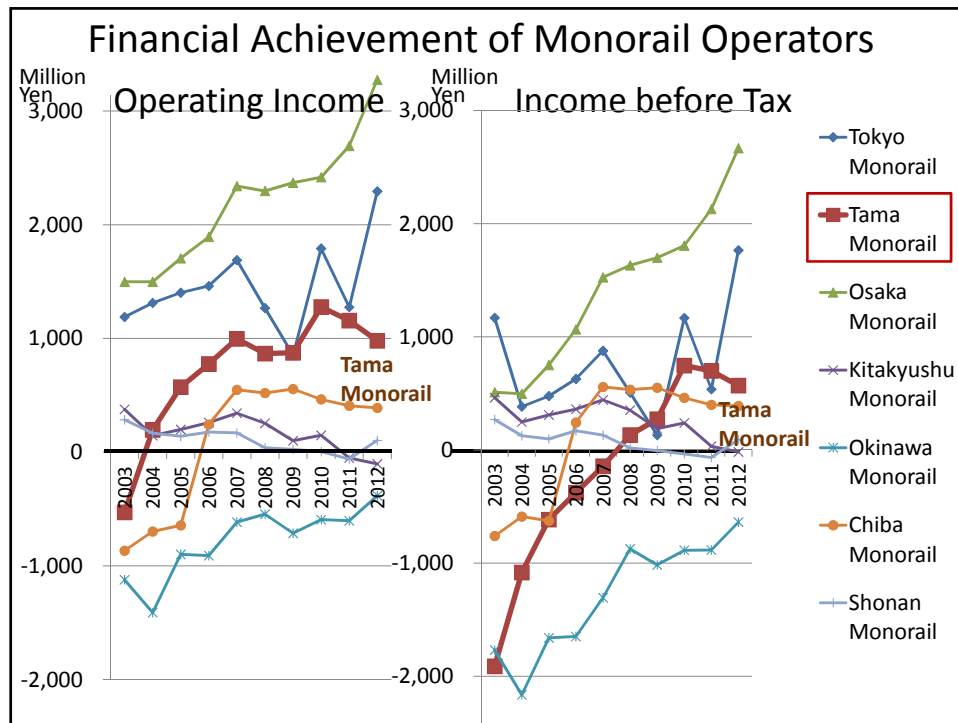




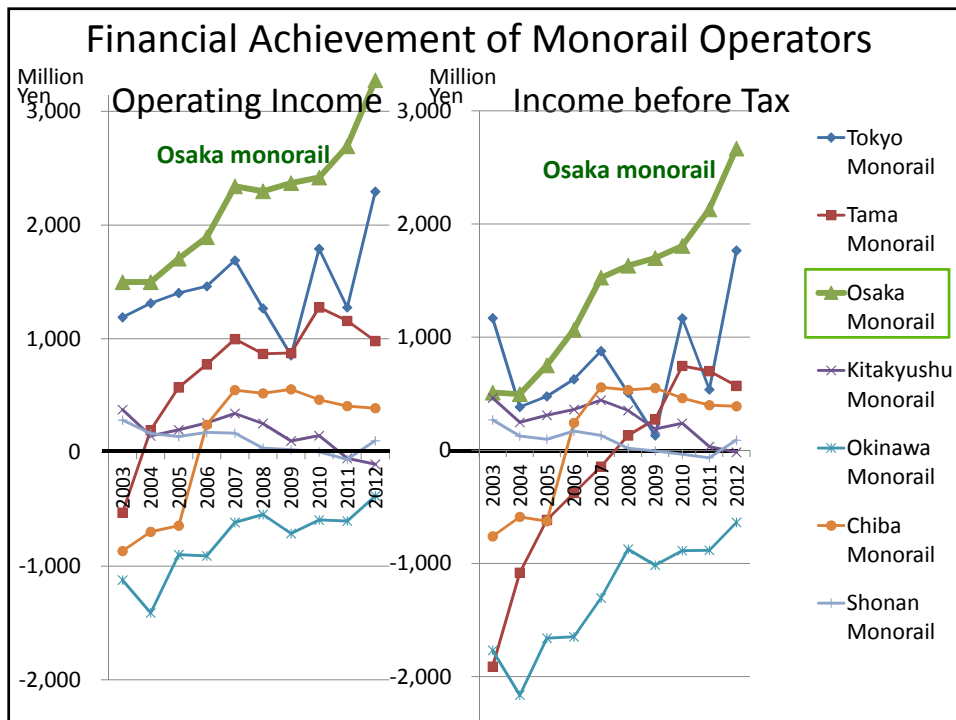
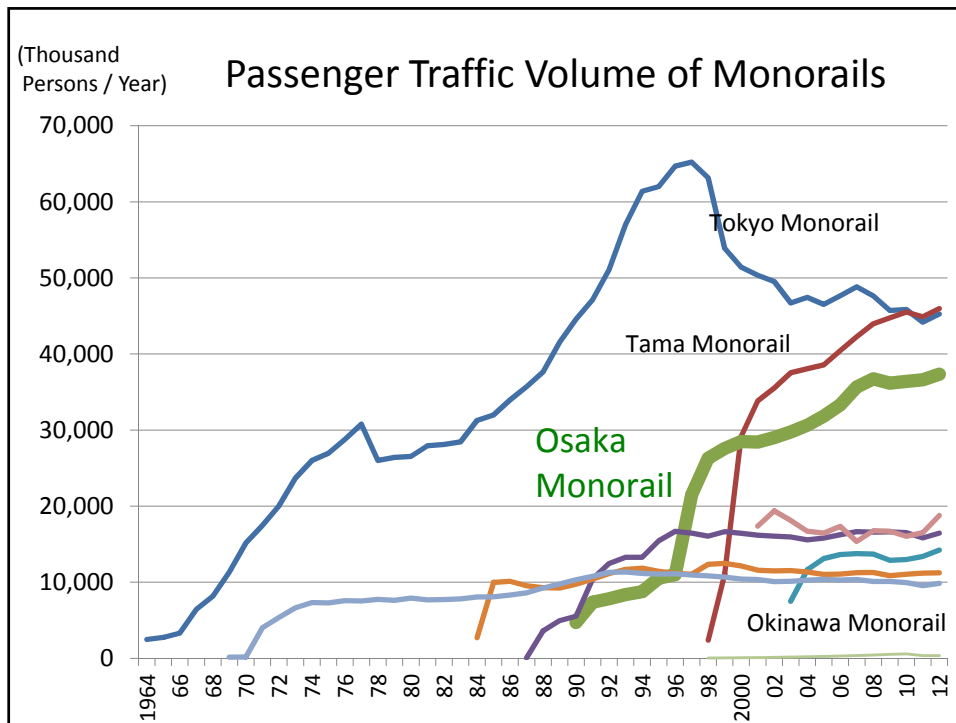














## Effects of Okinawa Monorail Construction

### Reduction of Traveling Time

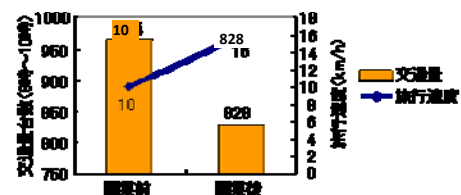
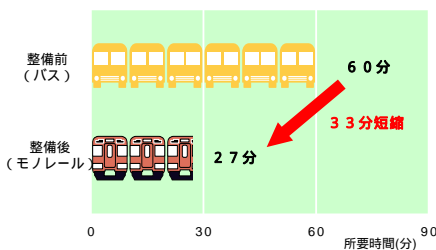
ex. Between Airport to Shuri Station: about 33 minutes reduction from 60 minutes by car to 27 minutes by monorail

### Alleviation of road traffic

ex. The case of central main street

Car traffic volume: about 15% reduction

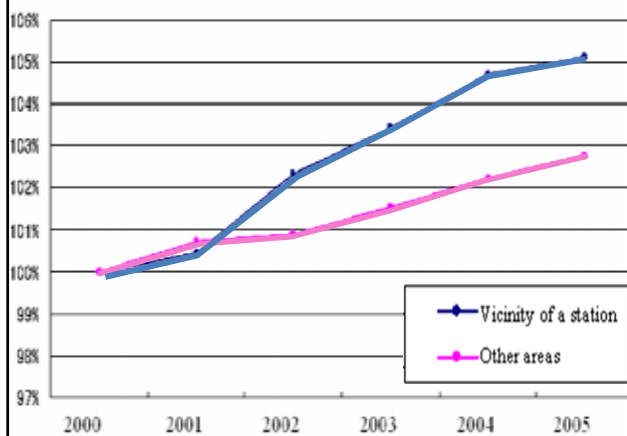
Car travlins speed: about 60% increase



## Okinawa Monorail and Urban Development Projects



### Population growth in the vicinity of monorail stations



### Development near Omoromachi Station



Start of Service  
(August, 2003)



Two years later,  
(November, 2005)



## Conclusion

Characteristics and operational records of the Japanese monorail system

Safe, Stable and Reliable transportation system

Integrated urban development and monorail construction contributes to sound urban development and sustainable monorail operation.

Japanese monorail systems built outside of Japan

Expectation to contribute to the development of Republic of India through Japanese monorail technology

**Thank you very much**