



## **NAGOYA SUBURBAN RAIL SUMMARY (COMMUTER RAIL, REGIONAL RAIL)**

**October 2003**

Japan's third largest urban area is substantially different. With a population of 8 million, Nagoya is approximately the same size as Chicago, but is much less dense than Tokyo or Osaka, at 7,400 per square mile. It is barely five percent more dense than the Los Angeles urban area. Only one-quarter of the Nagoya population lives in areas with more than 15,000 density, which constitute less than 10 percent of the land area

Nonetheless, Nagoya has a comprehensive commuter rail system with more than 500 miles of route operating over 35 routes and serving more than 800 stations. The systems are owned by private railroad companies, which also operate approximately 800 buses, in addition to conventional city bus systems. There are 0.77 commuter rail stations per square mile (one for each 1.3 square miles) of developed land area, which, like Osaka, makes it a more dense system than even Tokyo. Nagoya's commuter rail system operates without either capital or operating subsidies.

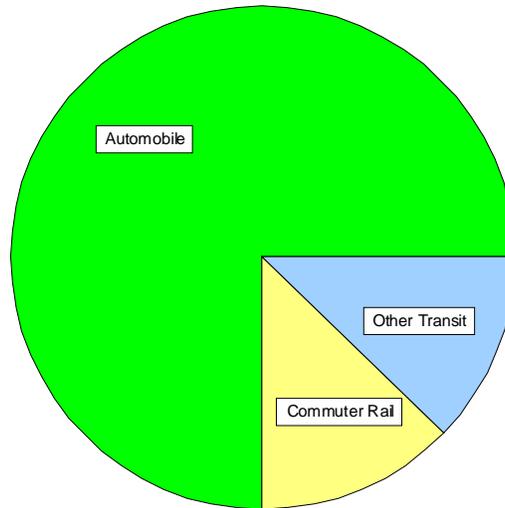
Like Tokyo and Osaka, the central area is served by a mesh of metro lines that provide convenient access to the central business district's more than 400,000 jobs. This represents seven percent of metropolitan area employment. The rate of job loss in the central business district has been four times that of the suburbs.<sup>1</sup>

Public transport's overall market share is, however, smaller in Nagoya, at approximately 25 percent, with nearly one-half of that accounted for by commuter rail. Annual commuter rail ridership is approximately 650 million, approximately 1.5 times the combined US annual total (Figure 6).

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<sup>1</sup> Calculated from Japan Statistical Bureau data.

## Nagoya Travel Market



**Figure 1**

The much lower population density and public transport market shares reflect the fact that Nagoya has become far more automobile oriented than either Tokyo or Osaka. With respect to both of these indicators, Nagoya has come to resemble the urban and transport form of European urban areas more than that of the two larger Japanese urban areas. Despite one of the world's most comprehensive commuter rail systems, Nagoya has become an auto-dominated urban area.

Like Tokyo and Osaka, the success of commuter rail in Nagoya results from the extensiveness of pre-automobile development (the result of reaching high-automotive status late), the extensive commuter rail system and connecting bus systems, the higher public transport system speeds and the high service frequency. These factors combine to make public transport competitive with the automobile throughout the urban area.

## APPENDIX TABLES

Appendix Table A International Pre-Automobile Commuter Rail Systems						
	Tokyo	Osaka	Nagoya	Paris	London	Sydney
<b>DEMOGRAPHICS</b>						
Population (000)	31,200	15,250	8,050	9,650	12,230	3,539
Urban Area (Square Miles)	2,030	1,050	1,090	1,060	1,600	811
Population Density	15,369	14,524	7,385	9,104	7,644	4,365
Gross Product/Capita 1999	\$28,327	\$25,376	\$28,535	\$32,343	\$27,365	\$25,643
Compared to Tokyo	0.0%	-10.4%	0.7%	14.2%	-3.4%	-9.5%
<b>CENTRALIZATION</b>						
% Population>15,000 Density	71%	70%	24%	56%	23%	1%
% Land>15,000 Density	46%	43%	9%	18%	8%	0%
Core Population Share	26%	17%	27%	22%	59%	15%
Suburban Population Share	74%	83%	73%	78%	41%	85%
CBD (Downtown) Employment Share	16%	18%	13%	17%	16%	11%
Outside CBD Employment Share	84%	82%	88%	83%	84%	89%
Employment in CBD (000)	2,434	1,380	500	891	1,099	175
<b>PUBLIC TRANSPORT SYSTEM</b>						
Public transport Market Share	56.7%	59.5%	24.6%	24.1%	17.1%	13.6%
Public transport/Auto Speed	1.6			1.5		
<b>COMMUTER RAIL</b>						
Commuter Rail Market Share	39.5%	36.4%	12.0%	7.2%	3.7%	5.6%
Compared to New York	59.9	53.3	18.2	11.0	5.6	8.5
Miles of Route	1,779	1,095	528	1,012	2,260	1,273
Stations	1,243	1,065	843	540	940	306
Station Density	0.61	1.01	0.77	0.51	0.59	0.38
Operating Subsidy?	No	No	No	Yes	Yes	Yes
Capital Subsidy	No	No	No	100%	100%	100%
Share with Freight?	No	No	No	Little	Little	Little
<b>HIGHWAYS</b>						
Traffic Density (Vehicle Miles/Sq.Mi.)	118,854			83,462		
Compared to Tokyo	0.0%			-29.8%		

EXTENT OF AUTO COMPETITIVE PUBLIC TRANSPORT SERVICE

Within Core	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
Suburbs to Core	HIGH	HIGH	HIGH	MIDDLE	MIDDLE	MIDDLE
Within Suburbs	HIGH	HIGH	HIGH	LOW	NIL	NIL

Appendix Table B  
United States Pre-Automobile Commuter Rail Systems

	New York	Chicago	Boston	Philadelphia
<b>DEMOGRAPHICS</b>				
Population (000)	20,253	8,307	4,032	5,149
Urban Area (Square Miles)	4,711	2,123	1,736	1,799
Population Density	4,299	3,913	2,323	2,862
Gross Product/Capita 1999	\$43,805	\$39,384	\$40,301	\$36,025
Compared to Tokyo	54.6%	39.0%	42.3%	27.2%
<b>CENTRALIZATION</b>				
% Population > 15,000 Density	44%	24%	20%	22%
% Land > 15,000 Density	5%	4%	2%	3%
Core Population Share	40%	35%	15%	29%
Suburban Population Share	60%	65%	85%	71%
CBD (Downtown) Employment Share	19%	13%	13%	14%
Outside CBD Employment Share	81%	87%	87%	86%
Employment in CBD (000)	1,733	485	280	351
<b>PUBLIC TRANSPORT SYSTEM</b>				
Public transport Market Share	9.0%	3.6%	3.8%	2.9%
Public transport/Auto Speed	0.9	0.8	0.6	
<b>COMMUTER RAIL</b>				
Commuter Rail Market Share	0.7%	0.5%	0.4%	0.3%
Compared to New York	1.0	0.7	0.6	0.4
Miles of Route	979	333	328	304
Stations	404	250	116	176
Station Density	0.09	0.12	0.07	0.10
Operating Subsidy?	Yes	Yes	Yes	Yes
Capital Subsidy	100%	100%	100%	100%
Share with Freight?	Little	Little	Little	Little

## HIGHWAYS

Traffic Density (Vehicle Miles/Sq.Mi.)	63,312	57,968	43,350	57,168
Compared to Tokyo	-46.7%	-51.2%	-63.5%	-51.9%

## EXTENT OF AUTO COMPETITIVE PUBLIC TRANSPORT SERVICE

Within Core	HIGH	HIGH	HIGH	HIGH
Suburbs to Core	MIDDLE	MIDDLE	MIDDLE	MIDDLE
Within Suburbs	NIL	NIL	NIL	NIL

Appendix Table C  
United States Automobile Era Commuter Rail Systems and Lines

	Washington- Baltimore	Los Angeles	San Diego	Miami	Dallas-Fort Worth	Seattle
<b>DEMOGRAPHICS</b>						
Population (000)	6,010	14,000	2,674	4,919	4,146	2,712
Urban Area (Square Miles)	1,840	2,299	782	1,116	1,407	954
Population Density	3,266	6,090	3,419	4,408	2,947	2,843
Gross Product/Capita 1999	\$41,316	\$33,486	\$34,495	\$31,261	\$40,306	\$38,928
Compared to Tokyo	45.9%	18.2%	21.8%	10.4%	42.3%	37.4%
<b>CENTRALIZATION</b>						
% Population>15,000 Density	10%	23%	3%	7%	2%	2%
% Land>15,000 Density	1%	6%	2%	2%	0%	0%
Core Population Share	20%	26%	46%	7%	29%	21%
Suburban Population Share	80%	74%	54%	93%	71%	79%
CBD (Downtown) Employment Share	19%	2%	6%	2%	6%	12%
Outside CBD Employment Share	81%	98%	94%	98%	94%	88%
Employment in CBD (000)	444	167	73	41	112	171
<b>PUBLIC TRANSPORT SYSTEM</b>						
Public transport Market Share	3.3%	1.4%	1.5%	1.3%	0.5%	1.8%
Public transport/Auto Speed	0.8	0.4	0.5			
<b>COMMUTER RAIL</b>						
Commuter Rail Market Share	0.05%	0.02%	0.02%	0.03%	0.01%	0.01%
Compared to New York	0.08	0.03	0.03	0.04	0.02	0.01
Miles of Route	191	415	43	71	35	34

Stations	56	48	9	19	9	7
Station Density	0.03	0.02	0.01	0.02	0.01	0.01
Operating Subsidy?	Yes	Yes	Yes	Yes	Yes	Yes
Capital Subsidy	100%	100%	100%	100%	100%	0%
Share with Freight?	Yes	Yes	Yes	Yes	Yes	Yes

#### HIGHWAYS

Traffic Density (Vehicle Miles/Sq.Mi.)	74,798	104,970	85,687	109,613	68,077	60,936
Compared to Tokyo	-37.1%	-11.7%	-27.9%	-7.8%	-42.7%	-48.7%

#### EXTENT OF AUTO COMPETITIVE PUBLIC TRANSPORT SERVICE

Within Core	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
Suburbs to Core	MIDDLE	MIDDLE	MIDDLE	MIDDLE	MIDDLE	MIDDLE
Within Suburbs	NIL	NIL	NIL	NIL	NIL	NIL

Note: Washington-Baltimore CBD data is for Washington and Baltimore.

<p><u>The Public Purpose</u>    <b>WENDELL COX CONSULTANCY</b>    <u>Demographia</u>  P. O. Box 841 - Belleville, IL 62269 USA  Telephone: +1.618.632.8507 - Facsimile: +1.810.821.8134</p> <p><i>To facilitate the ideal of government as the servant of the people by identifying and implementing strategies to achieve public purposes at a cost that is no higher than necessary.</i></p>
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