

Alleviating Environmental Load by Compact Town Planning

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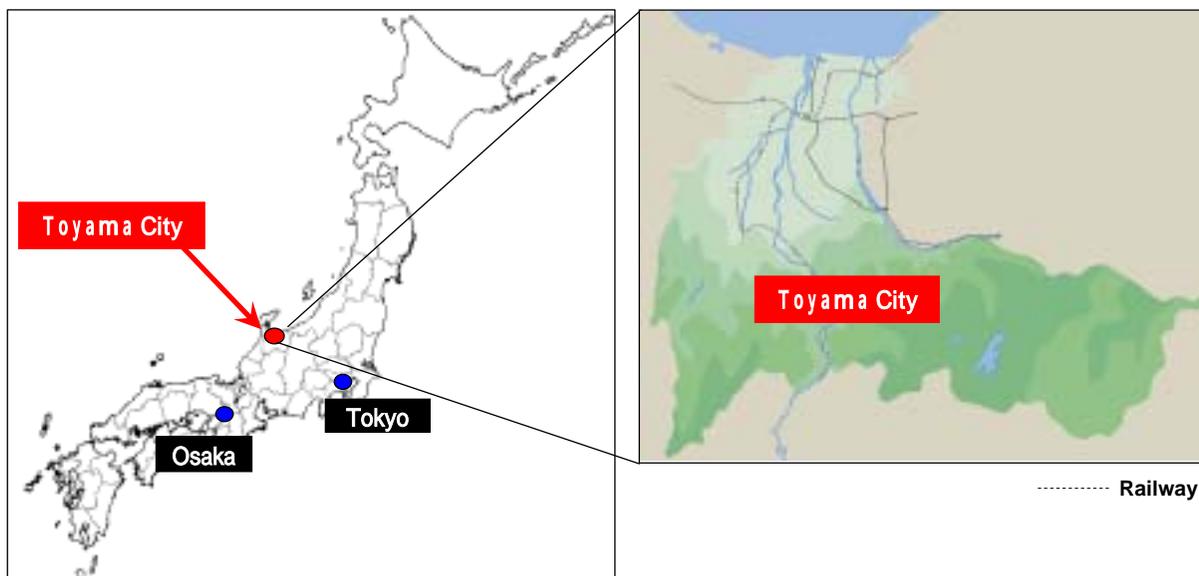
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1. Basic Facts of Toyama City

Population : Approx. 417,000 people

Area : Approx. 1,240km²

Geographical Features : The north of city is flat lowland facing Toyama Bay , the south of city has mountains as high as 3,000 meters.



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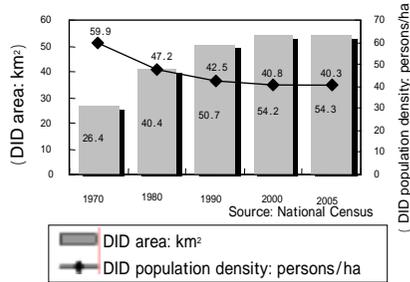
2. Characteristics of Toyama City

Widely and thinly spread urban area (DID area is the lowest among prefectural capital cities - 40.2 persons/ha).

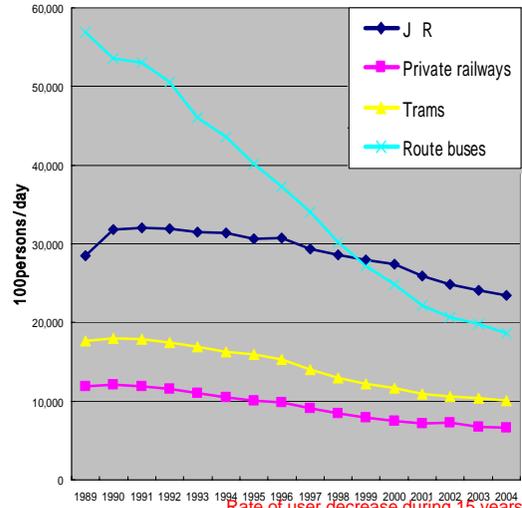
High dependency on automobile transportation (Automobile use is the highest among core urban areas - 72%)

Declining public transportation (The number of bus users has decreased to 1/3 over the last 15 years)

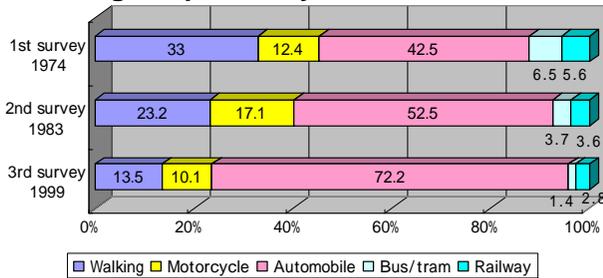
Low density city center



Declining public transportation



High dependency on automobiles



Rate of user decrease during 15 years between 1989 and 2004

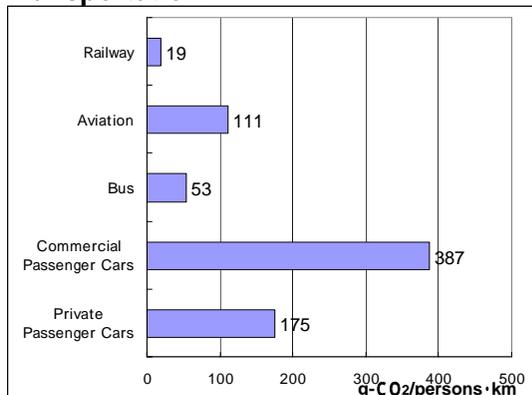
Route buses	67%
Private railways	44%
Trams	43%
JR	17%

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3. Urban Structure and Transportation System with High Environmental Load

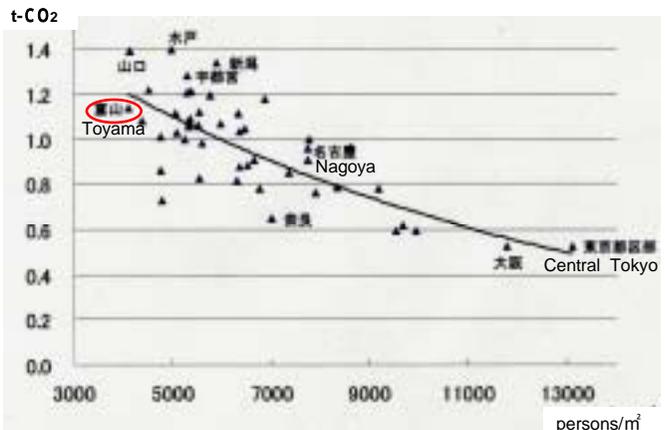
In a city with low density and high dependency on automobile traffic, the environmental load per-capita is large in Toyama City.

CO₂ Emission Intensity by type of Transportation.



Source: Estimation by Ministry of the Environment (2004)

DID Population and CO₂ Emission per-capita



Source: Estimation by Ministry of the Environment (2000)

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4. Transition of CO₂ Emission of Toyama City

In Toyama City, CO₂ Emission increased by approx. 29% from 1990 to 2003.

CO₂ Emission of transportation sector increased by approx. 28%.

CO₂ Emission of Toyama City

(Unit: 1,000t - CO₂)

	1990		2003		Increasing Rate(%) 2003/1990
		(Breakdown %)		(Breakdown %)	
Industrial Sector	1,672.9	48.0	2,062.6	45.8	23.3
Transportation Sector	850.4	24.4	1,086.5	24.1	27.8
Consumer Sector (Home)	531.4	15.2	709.9	15.8	33.6
Consumer Sector (Business)	432.9	12.4	642.9	14.3	48.5
Total	3,487.6	100.0	4,501.9	100.0	29.1

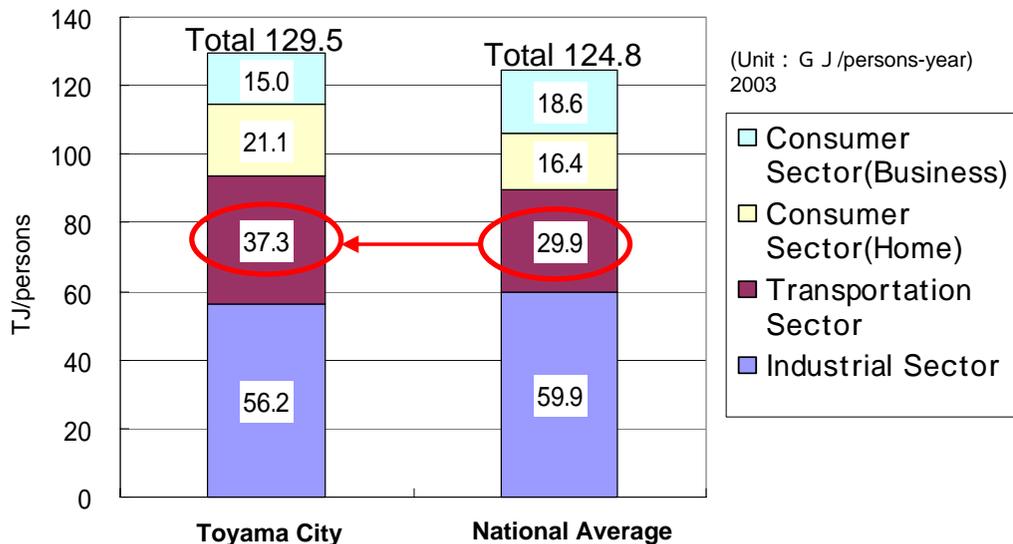
Source: Toyama City Regional Energy Conservation Vision

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5. Comparison of Energy Consumption of Toyama City with National Average

Energy consumption of Toyama City is approx. 4% higher than national average, and transportation sector accounts high proportion.

Comparison of Energy Consumption per-capita



Source: Toyama City Regional Energy Conservation Vision

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6. Toyama City Regional Energy Conservation Vision(2007 February)

“Toyama City Regional Energy Conservation Vision” is formulated to curb energy consumption in 2010 at the equal level in 2003.

(1)Basic Policy

“Compact Town, Slim Life”

Citizen, companies and administration cooperate to promote energy conservation and support compact town planning environmentally by revitalizing public transportation.

(2)Aim

(Reducing emissions to 5% below estimation in 2010.)

Curb energy consumption in 2010 at the equal level in 2003

(3)Approaches for the Aim by Each Sector

Industrial Sector: Reducing energy emission systematically in each industry or each factory.

Transportation Sector: Reducing energy emission systematically in each category of railway, ship and aviation.

Automobile: Environmentally benign driving by over 30% of drivers

“NO my car day”

Introduction of Hybrid car and Economical car

Revitalizing and promotion of utilization of public transportation

Consumer Sector (Home): Practice the “Ecological Lifestyle”

Attempt to conserve the energy consumption by over 30 % of family units

Conversion to energy saving instruments

Adoption of high efficiency water heater

Consumer Sector (Business) :Building the environmental vision into business activities

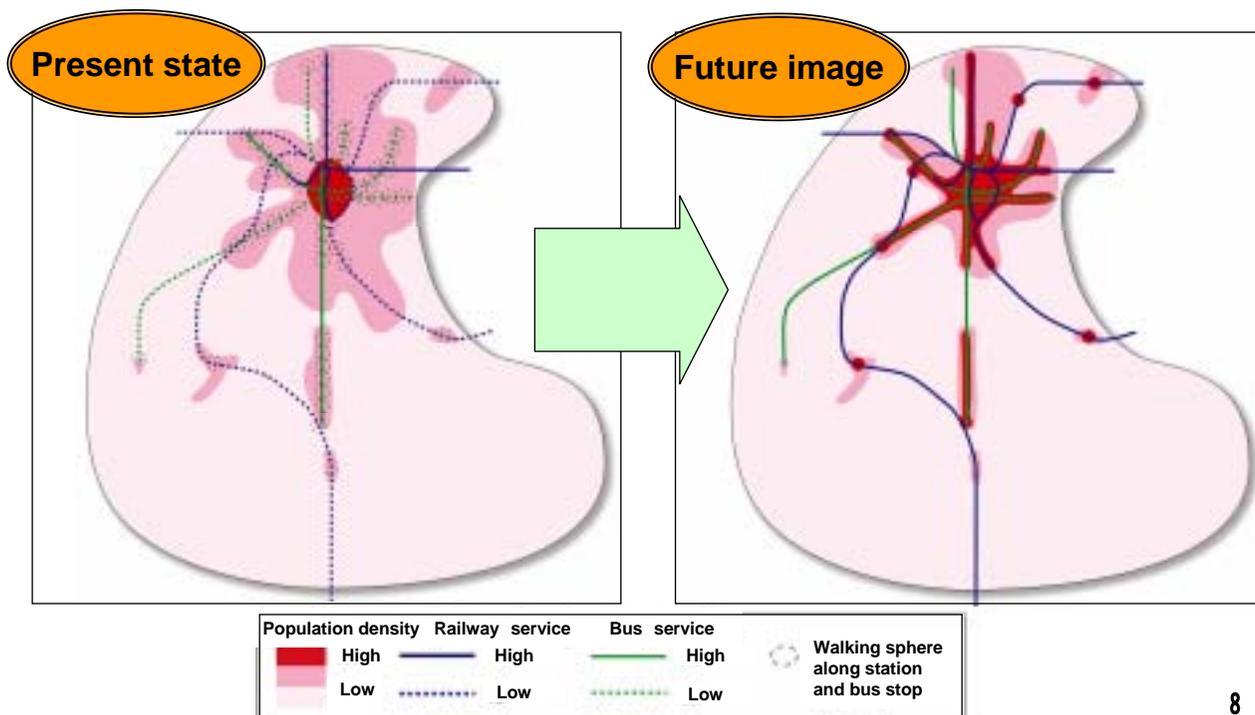
Utilizing the energy saving diagnosis , BEMS , ESCO etc.

Adoption of energy saving instruments and high efficiency water heater etc.

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7. Basic Policy for Urban Development

Convert the urban structure and transportation system into one with a lower energy load by revitalizing public transportation and planning a compact town along each line.

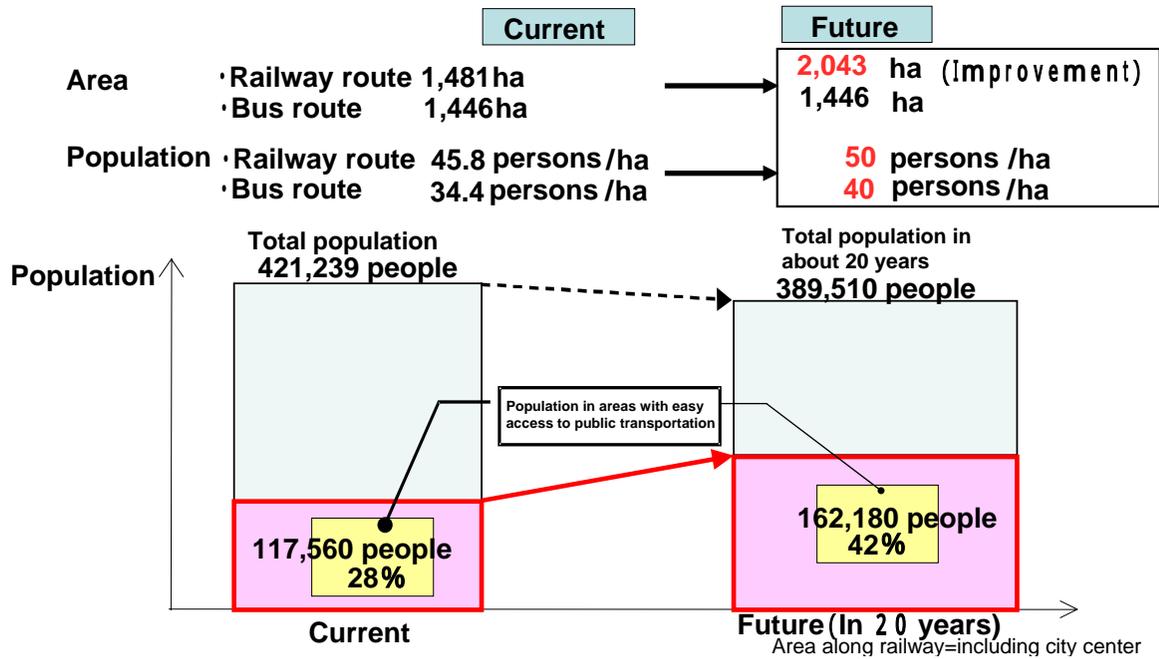


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7. Basic Policy for Urban Development

Increase the population of people living around areas with easy access to public transportation, though the population of Toyama City will decrease.

Population in areas with easy access to public transportation



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8. Conversion of JR Toyama Port Line into LRT

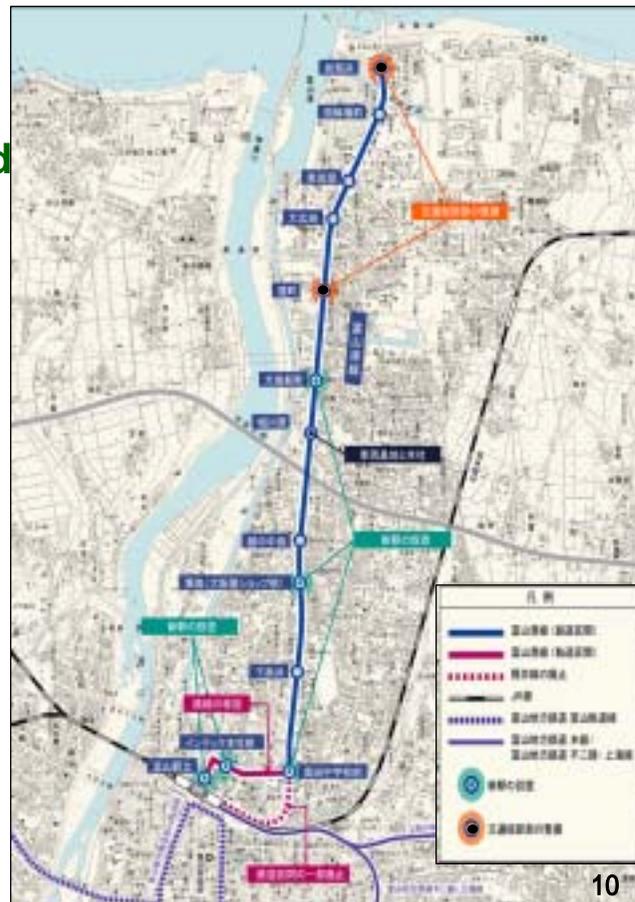
(1) Achievement in short period

Inaugurated 3 years after announcement of the concept (Inaugurated 14 months after starting construction).

(2) Integration of Tram and Railway

First Tram introduced in Japan in the last 58 years.
 1.1km of Shared Track Section (Track Law) , 6.5km of Dedicated Track Section (Railway Business Law).

Route plan of LRT



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Shared Track Section (Town Planning Road Aiden-Kitadai Line) (Track Law)



Dedicated Track Section (Hasumachi) (Railway Business Law)



(3) Complete Introduction of LRT

All seven cars are low floor vehicles
All barrier-free stops
Noise prevention by damping track and lawn track
IC card system

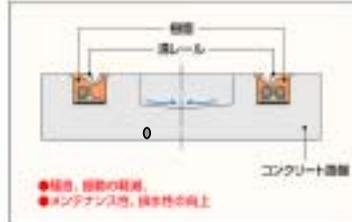
All low floors



All barrier-free stops (INTEC Honsha-Mae)



Damping track set with polyurethane sealing compound



レールとコンクリート基盤を密着で固定する「密着固定軌道」と、レールと道床間隙との充填がしやすい「溝レール」という新技術を採用。

Lawn track (Toyama-eki Kita)



富山駅からプールパールの有料軌道区間に、騒音や振動を低減した正土軌道を採用。

IC card reader installed in the vehicle



(4) Improvement of Service

Addition of three new stops and an average interval between stops of 600 meters.

Services 3.5 times more frequent than before (Morning peak hours : Every 10 minutes , Non-peak hours : Every 15 minutes).

Extension of the Service Schedule for the last train from 9 pm to 11 pm

Flat fare of 200 yen (160 yen for IC card users , 100 yen for users over 65 years old).

Credit exit (allow passengers to exit from the rear) **for IC card users .**

Improvement of service

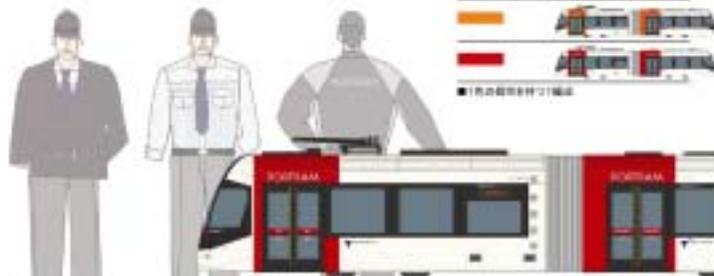
	JR Toyama Port Line		LRT
Service schedule	every 30~60 minutes	→	every 15 minutes 10 minutes during peak hours
First train/Last train	5am/9pm	→	5am/11pm
Stops	9 stops (excluding for Toyama Station)	→	13 stops
Vehicles	Railway vehicles	→	All low floor vehicles



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(5) Adoption of Uniform Design

Adopting uniform design for vehicles , stops , crew uniforms , signboards , IC cards , etc.



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(6) Cooperation with Town Planning along LRT Line

With the abolition of some bus routes, introducing 2 feeder bus lines.

Construction of LRT related facilities(2 open areas in front of station, 11 bicycle parking areas , etc.) .

By utilizing subsidies for town planning, revitalizing the area through the development of historical town landscape along the LRT line.

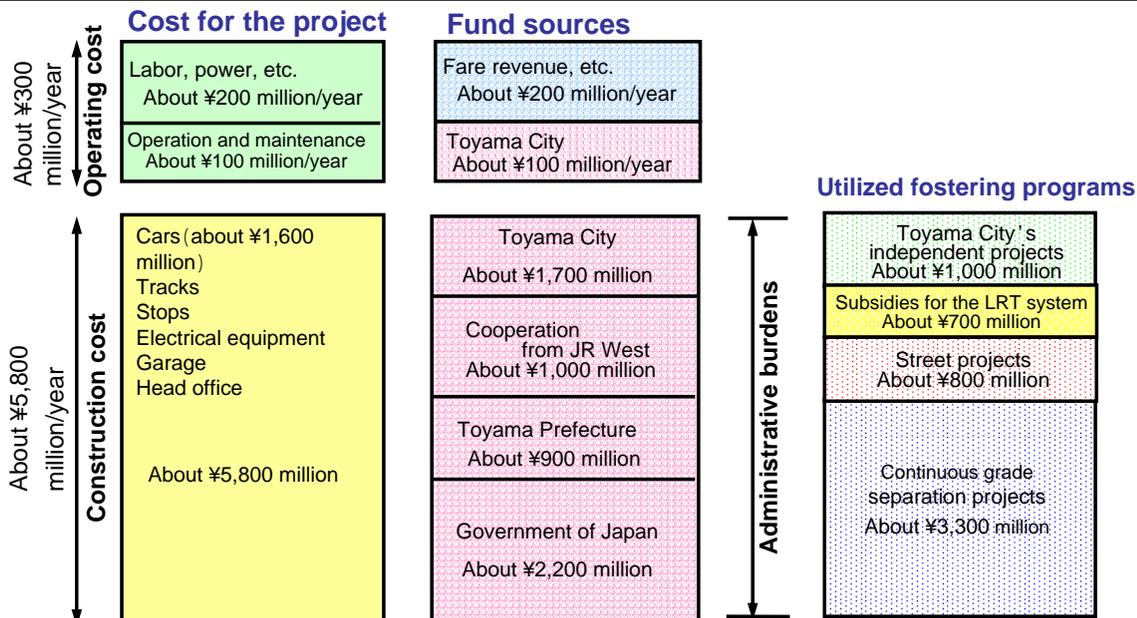


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(7) Adoption of the Concept of “Public Construction and Private Operation”

By adopting the concept of public construction and private operation, the government was responsible for the total construction cost and maintenance cost (about 1/3 of construction cost).

Utilizing subsidies, Toyama City’s contribution was reduced to about 1.7 billion yen from 5.8 billion yen of the total construction cost.



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(8) Participation of Citizens and Local Businesses

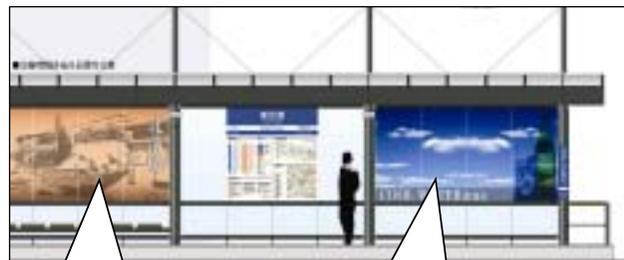
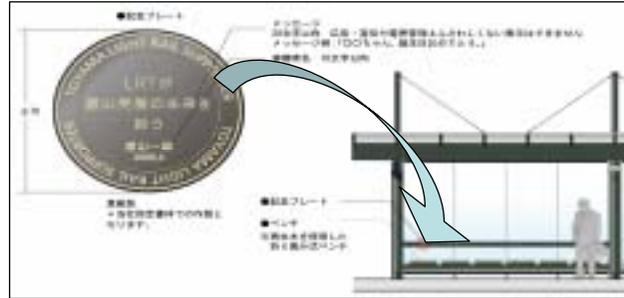
Broad support from citizens and local businesses through donations of funds or donations for benches.

Cooperation with local businesses through investment for establishing a third-sector corporation, becoming a sponsor for wall space at each stop, sales of the naming rights of new stops, etc.

Raised money for setting benches and installed memorial plates on benches with messages from the donor (50,000 yen per bench × 168 benches).

Sold the naming rights of new stops 2 stops were named by 2 local firms (15 million yen per stop).

16 local firms became sponsors for the wall space at each stop to express the characteristics of each street and 28 local firms became sponsors for wall space used for advertisements.



Representation Space

Advertisement Space

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9. Effects of the Development of the Toyama Light Rail

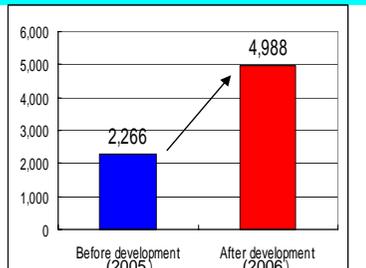
Sharp increase in the number of users.
12% of users have converted from automobile transportation use.
Conversion of urban structure is a medium-long term issue under consideration.

Before development (JR Toyama Port Line) : October, 2005

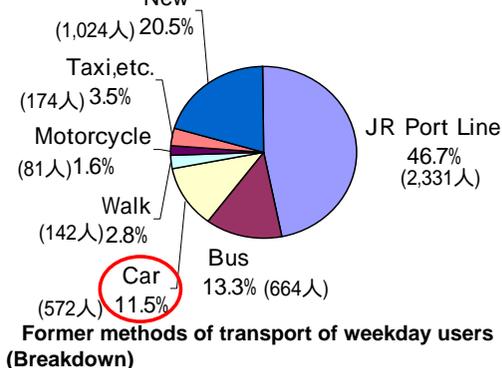


After development (Portram) : October, 2006

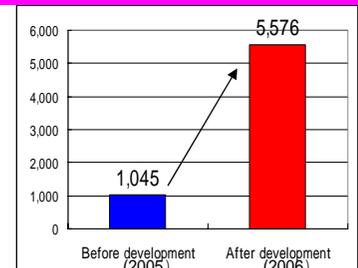
Weekdays



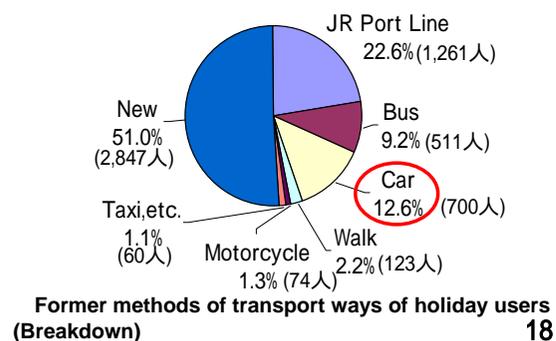
Comparison of the number of users



Holidays



Comparison of the number of users



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10. Effects of CO₂ Reduction by The Development of LRT and others

Reduction of approx. 436t of CO₂ by the development of LRT
 Conversion of urban structure for increasing the effects of CO₂ reduction is medium-long term issue.

Effects of CO₂ Reduction in fiscal year

	Reduction by conversion into LRT	Reduction by roadway improvement	Reduction by living in city center	Total
2005	0	0	9	9
2006	436	0	27	463
2007 (Expectancy)	436	158	31	625

Unit: t-CO₂ / Year

Amount of reduction is based on the figure of fiscal 2004