

Special Issue:

Transportation and Urban Development in the Chubu Region

特集：

中部地域における交通とまちづくり

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Preface

特集の編集にあたって

Shigeru Fukushima / Professor of the Faculty of Urban Science, Meijo University
福島 茂 / 名城大学都市情報学部教授

Over the past couple of years, there has been a search for new forms of regional transportation and urban development. Japanese provincial cities are confronting various issues including excessive motorization, suburbanization, and declining population densities within cities, leading to the decay of city centers. This type of urban structure can be considered neither easy to live in nor sustainable on various fronts including the environment, which needs a low-carbon society, municipal communities that are graying and shrinking in terms of population, and the harsh financial conditions of local governments. Even Japanese cities are beginning to demand both a compact city structure centered on public transportation and the rebuilding of flourishing city centers that make it possible to develop local culture and pass it on to the next generation, as well as to raise the quality of life.

However, it is not easy to transform an urban structure that is dependent on cars. This is particularly true since demand-supply adjustment regulations were eliminated through revisions in the Railroad Business Law in 2000, which effectively made it possible for railroad companies to terminate service on unprofitable lines by simply submitting notification a year in advance. Many railroad companies, whose financial resources have been eaten away at by the exodus from public transportation, have started to terminate service on lines, and many local lines have already been discontinued. The termination of train service on local lines accelerates the decay of local communities and undermines the quality of life of the transportation disadvantaged such as elderly and middle and high school students.

Against this backdrop, local governments and residents have begun to spearhead efforts to maintain local transportation; initiatives to revitalize city centers and develop communities centered on local transportation are also beginning to be seen. Cutting-edge cases in the Chubu Region are introduced in the feature articles on Toyama City and Fukui City. In the first feature article, Jun Nomura of the City Improvement Department of Toyama City looks at the city's efforts to implement efficient, sustainable urban development that revitalizes

近年、地域交通とまちづくりの新しいかたちが模索されつつある。日本の地方都市ではモータリゼーションと郊外化・市街地の低密度が過度に進み、中心市街地が衰退している。こうした都市構造は、低炭素型社会を求める地球環境、高齢化・人口減少過程に入った都市社会、厳しい地方財政のいずれの面からも持続可能で、住みよい都市とは言えなくなっている。日本の諸都市も公共交通を軸とするコンパクトな都市構造や、地域文化を継承・発展させ、生活の質を高める賑いのある中心市街地の再生を求めようとしている。

しかし、自動車依存型の都市構造を転換することは容易ではない。とりわけ、2000年の鉄道事業法改正によって需給調整規制が撤廃され、事実上、鉄道事業者は1年前の事前廃止の届出で不採算路線を廃止できるようになった。これまでの公共交通離れにより経営体力を消耗していた多くの鉄道事業者が路線廃止を打ち出し、既に多くのローカル線が廃止されている。こうしたローカル線の廃止は、地域社会の衰退を加速させ、高齢者や中高生などの交通弱者の生活の質を著しく低下させることになった。

このような状況のなかで、地方自治体や地域住民らが中心になって地域の公共交通を維持するための取り組みを始めている。公共交通の整備を軸とするまちづくりや中心市街地活性化の取り組みも見られ始めた。特集記事で取り上げた富山市と福井都市圏からの報告は、中部地域におけるこうした先進事例を紹介するものである。富山市では鉄軌道をはじめとする公共交通を活性化させ、その沿線に居住、商業、業務等の機能が集積した地域拠点型のコンパクトな市街地形成を図り、自動車に頼らなくても安心して暮らせる、効率的で持続可能なまちづくりを目指している（特集記事1：富山市都市整備部・野村 潤）。

public transportation, particularly railroads, creates a compact urban structure based on local community hubs that concentrate various functions including housing, commerce, and business along transportation lines, and makes it possible for people to live in peace of mind without being dependent on cars. Of particular interest is the effort to transform urban structure through an encouragement approach that introduces incentives to rebuild public transportation, revitalize the city center, and live along transportation lines. In the second feature article, Yoji Kawakami of the Graduate School of Fukui University looks at the case of the Fukui City metropolitan area, in which the local community worked to rehabilitate a local railroad. This article describes how having come to realize the value of maintaining the local railroad after service was terminated, residents worked with both local governments of municipalities along the train line and the new railroad company to resurrect the railroad. Efforts are being made to find a way to rebuild local public transportation that increases external economic benefits such as enlivening the local community and ensuring transportation welfare. While the national government passed the Act on Revitalization and Rehabilitation of Local Public Transportation Systems in 2007, the efforts by both Toyama City and Fukui City are highly praiseworthy as having preceded central government efforts.

On the other hand, demand management is one way to promote the shift from car use to public transportation. Unlike provincial cities, major cities are searching for ways to encourage the use of public transportation by restricting the flow of cars into city centers. Introducing a road pricing system to control car traffic into city centers would be difficult in Japan due to social resistance—there are fears that such a system would make it difficult to revitalize city centers. In the third feature article, Takayuki Morikawa of the Graduate School of Nagoya University looks at parking deposit systems (PDS), an alternative to road pricing which are drawing attention as a socially-acceptable method to control car traffic into city centers. Morikawa reports on the effectiveness of PDS based on the research on Nagoya City.

とりわけ、公共交通の再構築と中心市街地活性化、沿線居住へのインセンティブを導入した誘導型アプローチによって都市構造を再編していく取組みが興味深い。また、福井都市圏の事例では、地域による地方鉄道の再生を取り上げている（特集記事2：福井大学大学院・川上洋司）。ここでは、地方鉄道の廃止を契機にその存在価値に地域住民が気づき、沿線自治体、地域住民、新鉄道事業者が協働で地域鉄道を再生していく物語が描かれている。地域活性化や交通福祉の確保などの外部経済効果を高める地方公共交通の再生が模索されている。政府は、2007年に「地域公共交通の活性化及び再生に関する法律」を施行するが、富山や福井の取り組みはこうした国の動きを先取りするものとして高く評価されている。

一方、自動車交通から公共交通への転換を促すアプローチとして、需要管理手法がある。地方都市とは異なり、大都市では都心部への自動車の流入抑制によって公共交通への転換を促すアプローチも模索されつつある。しかし、ロードプライシングによる自動車の都心流入抑制は日本では社会的に受容されにくく、その導入は難しい。都心の活性化を妨げる恐れもある。特集記事3では、通常のロードプライシングに変わって、社会的にも受容されやすい都心部自動車流入抑制策として注目される「Parking Deposit System (PDS)」を取り上げている。名古屋市を事例とした調査研究をもとに、PDSシステムの有効性を報告している（名古屋大学大学院・森川高行）。

Echizen Railway—Rehabilitation of a Local Railroad—Background and Lessons

地方鉄道「えちぜん鉄道」再生の経緯とその教訓

Yoji Kawakami / Professor, Graduate School of Engineering, Faculty of Engineering, University of Fukui

川上 洋司 / 福井大学大学院工学研究科教授

● Introduction

Following the elimination of demand-supply adjustment regulations due to revisions in the Railroad Business Act in 1999, there has been a debate on whether to maintain or eliminate local railways, which are facing harsh business conditions throughout Japan. The situation for each train line is different—service on some have already been discontinued, and the debate on whether to maintain or discontinue service on others rages on. Cases in which a train line has been resurrected and operated under a new scheme after service was terminated have also begun.

One example of this is the case of a local railway in the Fukui region that was rehabilitated and continued to provide service. In this article, I trace how the situation unfolded and introduce several lessons that the local community learned during the process.

1. Distinguishing features of the Fukui region and background of the rehabilitation

Centered on Fukui City (population 270 thousand), the Fukui region with a population of 600 thousand in the greater metropolitan area can be considered a typical Japanese provincial metropolitan area. As for transportation, the metropolitan area has one of the highest car dependency rates in Japan—76.6% according to a 2005 PT survey.

This has two implications. First, there are many people who are able to use cars, and many people are satisfied with the convenience provided by driving. The second implication is that as the use of cars increased, transportation policies and planning focused on increasing the flow and safety of car traffic, which has resulted in a transportation system centered on roads for cars, an administrative system that maintains this system, and a majority of residents who approve of the system.

Therefore, there has been little impetus to correct the existing dependency on cars, which can be called excessive, to fundamentally review, from a comprehensive and long-term perspective, transportation policies that stress car use, as well as to introduce policies that also stress public transportation. What is significant is that the resurrection of the former railroad company as Echizen Railway (mentioned below) and later efforts that occurred happened in such a region.

The background of the rehabilitation and continuation of train services can be characterized by three stages— (1) the private railway company Keifuku Electric Railroad announces that it will terminate service on some lines and introduce a bus service as a replacement, which generates debate on whether to maintain or terminate service on the line (1992–), (2) train service is suddenly terminated on all

● はじめに

鉄道事業法改正（1999年）による需給調整規制の撤廃を機に、全国各地域において厳しい経営状況にある地方鉄道の存廃論議が展開されることになった。既に廃止という事態に至った路線、現在も存廃議論の渦中にある路線と様々であるが、廃線という事態を乗り越え、新しいかたち（スキーム）で存続・再生に至った事例も現れ始めている。

その一つが、福井地域における地方鉄道の存続・再生事例である。ここでは、その経緯を辿り、その過程で地域が学んだいくつかの教訓を紹介する。

1. 福井地域の状況と再生に至る経緯の特徴

福井地域は、福井市（人口約27万人）を中心とする我が国の典型的ともいえる地方都市圏（都市圏人口約60万人）であり、交通面では全国有数の自動車依存都市圏（自動車分担率76.6%、2005年PT調査結果）である。

このことは、一つには、車を利用可能な人々が多数を占めており、多くの人々が車利用による移動の利便性に満足していることを意味する。二つには、車利用の増大の中で、これまでの交通面での政策・計画的対応は車交通を円滑・安全に捌くことを重視し、その結果として車のための道路を主体とする交通体系、それを維持する行政体制、支持する地域住民（多数派）意識が形成されていることを意味する。

このために、過度とも言える車依存の現状を肯定する力が強く働き、長期的、総合的観点に立って車系主体の交通政策を抜本的に見直し、公共交通も重視する政策への転換の動きは弱い状況にあった。以下に述べる「えちぜん鉄道」としての再生とその後の取り組みは、こうした状況下にある地域での事例ということに意義がある。

再生に至る経緯としては、京福電鉄（私鉄）の一部路線廃線・バス転換表明と存廃論議（1992～）—「突然の全線運行休止／バス代行・代替」（2001.6～2003.7）—「えちぜん鉄道としての再生・活性化」（2003.7～）という三つの状況を経て存続・再生に至ったというところに特徴がある。廃線予定区

lines, and buses are introduced (June 2001–July 2003), (3) train service is relaunched and revitalized under Echizen Railway (July 2003–). The sudden suspension of service on all lines due to two accidents that occurred within six months on the line that was expected to be closed can be viewed as an unexpected negative trial program, but the rehabilitation of the local railway as Echizen Railway under a scheme, which can be called the Fukui method (separating the infrastructure and operation functions of the company), and later developments can be considered a positive trial program that demonstrated the possibility of rehabilitating and reinvigorating local railways through the efforts of the local community.

2. Sudden suspension of service—lessons and benefits for the local community²

In 1992 Keifuku Electric Railroad announced that it would terminate service on some lines and introduce bus service as an alternative, but before a final decision could be made on the fate of the lines, two accidents occurred within six months (December 2000 and June 2001) of each other on the line whose service was to be terminated. As a result of these two accidents, the Ministry of Land, Infrastructure, Transportation and Tourism issued an unprecedented business improvement order related to ensuring safety, and service on all branches of Keifuku Electric Railroad's Echizen line was immediately suspended and buses were introduced as an alternative. Not only did this settle the question of whether Keifuku Electric Railroad would abandon operations or not, but it also generated a debate throughout the whole community on whether or not to maintain train service and what scheme to use if the decision was to maintain the service.

As a result of the developments shown in table 1, a decision was made to rehabilitate the railroad under a new scheme (figure 1- train line map), and the local community learned various lessons and obtained a valuable result though its experience with the unexpected, sudden suspension of service on all lines.

間での半年間で二度の事故による突然の全線運行休止は、「予期せぬマイナスの社会実験」、福井方式ともいえる仕組み（上下分離）でのえちぜん鉄道としての再生とその後の取り組みは「地域を挙げて地方鉄道の再生・活性化の可能性を検証するプラスの社会実験」とみなすことが出来る。

2. 突然の運行休止によって地域が学び、得たこと²⁾

1992年の京福電鉄による一部路線の廃止・バス転換表明以降、存廃に決着がつかない中で、2000年12月、翌2001年6月と半年の間に、2度の事故が廃線対象区間で引き起こされた。この二度の事故発生により、国土交通省から前代未聞の「安全確保に関する事業改善命令」を発せられ、地域は京福電鉄越前線全線の即刻運行休止／バス代行という事態を経験することになった。これによって、京福電鉄の撤退は決定的になるとともに、運行休止という予期せぬ事態の中で、地域をあげての存続の可否、存続の仕組みについての議論が展開された。

結果的に、表1に示すような経緯を経て、新しい形での鉄道再生（図1路線図）ということに至ったが、突然の運行休止という不測の事態を経験する中で、地域は多くのことを学び、そして価値ある成果を得ることになった。

Table 1: Background of Echizen Railway Rehabilitation

表1：えちぜん鉄道再生の経緯

Feb. 1992	Keifuku Electric Railroad submits request to end service on some sections and replace service with buses → Start of debate whether to terminate or maintain service 京福電鉄より一部区間の廃線・バス転換の申し入れ ⇒ 存廃議論の開始	Period that Keifuku Railroad operated the line 京福電鉄 運行期間
Feb. 2000	Head-on collision between two trains in section expected to be closed 廃線予定区間での電車正面衝突事故	
Jun. 2001	Second head-on collision between two trains in section expected to be closed 同上区間での2度目の電車正面衝突事故	
Jun.-Jul. 2001	Train service terminated on all Keifuku Electric Railroad lines Chubu District Transport Bureau issues business improvement order 京福電鉄全線運行休止／バス代行 中部運輸局による「事故改善命令」	Period of suspended train service and start of bus operation instead (first pilot program) 鉄道運行休止/ 代行バス運行期間 (第一の社会実験)

Oct. 2001	Keifuku Electric Railroad submits notification of closing 京福電鉄事業廃止届け提出	Period of suspended train service and start of bus operation instead (first pilot program) 鉄道運行休止 / 代行バス運行期間 (第一の社会実験)
Jan. 2002	Agreement reached between the prefecture and municipalities along the line to maintain the train line through a third-sector business → Start of debate on mechanism to maintain the line 第3セクターによる存続を県・沿線市町村間で合意 →存続の仕組みの議論開始	
Sep.-Oct. 2002	Echizen Railway Inc. launched Business transfer agreement concluded with Keifuku Electric Railroad えちぜん鉄道株式会社設立 京福電鉄との間で営業譲渡契約締結	
Feb. 2003	Chubu District Transport Bureau OKs railroad business transfer 中部運輸局より鉄道事業譲渡譲受認可	Rehabilitation of Echizen Railway and promotion of use (Second pilot program) えちぜん鉄道としての再生と利用促進 (第二の社会実験)
Jul.-Oct. 2003	Service on lines is gradually introduced by Echizen Railway えちぜん鉄道として一部路線を皮切りに段階的に運行開始	
From rehabilitation to present 再生から現在	Various types of promotional policies are developed in cooperation with the local community 地域と連携した各種利用促進策の展開	
FY2006	Number of users reaches 2,918,000, which surpasses the number when Keifuku Electric Railroad operated the lines (FY2000) 利用者数 約 2,918 千人 →京副電鉄当時 (2000FY) を上回る	
FY2007	Number of users reaches 3,070,000. 利用者数 約 3,070 千人	
FY2008	Target of 3,200,000 users is always achieved. 目標利用者数 3,200 千人をほぼ達成	

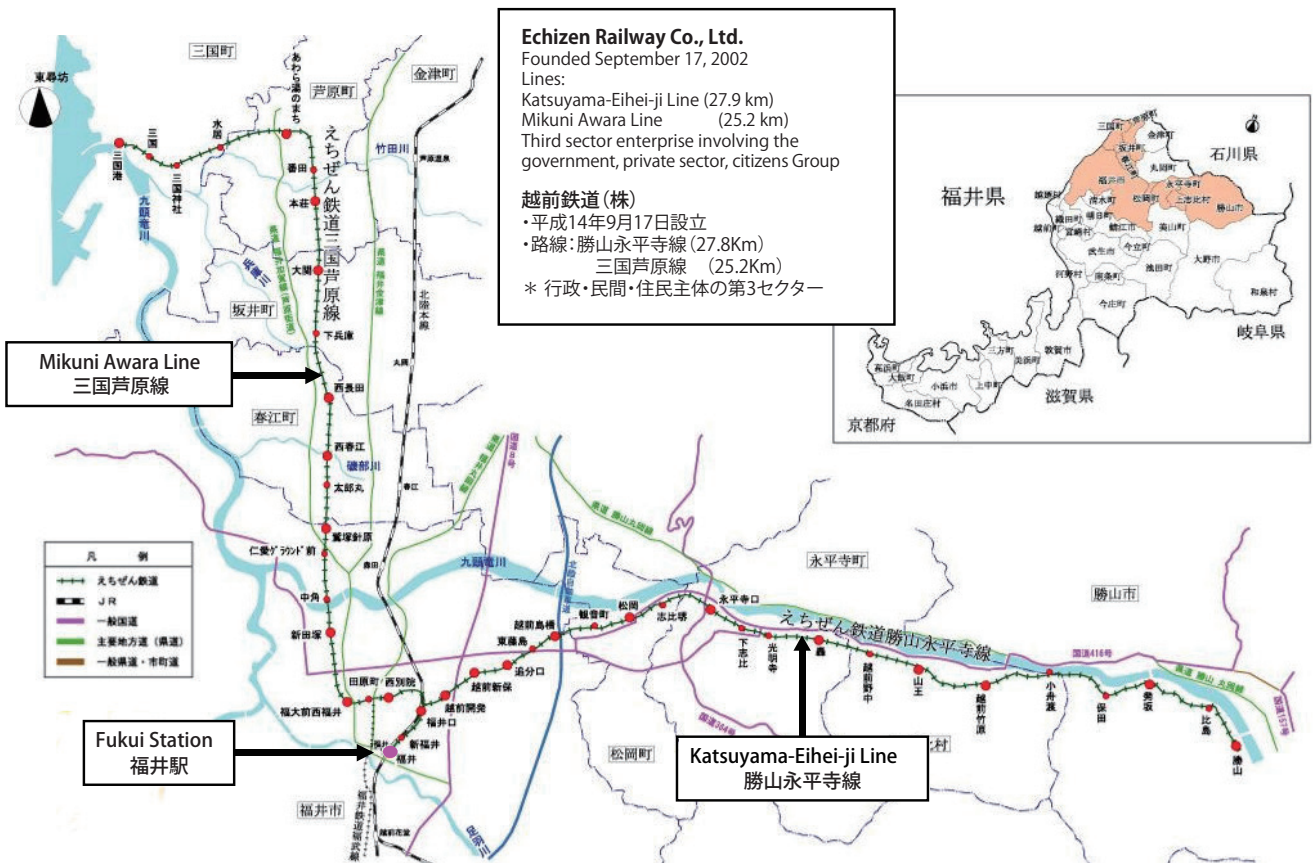


Figure 1: Echizen Railway Lines
 図 1 : えちぜん鉄道路線網

● Value of the railroad made clear by suspension of services

The sudden suspension of train service and the introduction of buses provided the people living along the line with an opportunity to gain an awareness of the value of maintaining the railroad and the various benefits and conveniences of the railroad from their individual perspectives. A survey I conducted of people living along the train line and users of the bus during the period when train service was suspended revealed the relationship between the railroad and the lives of various types of people, not only passengers.

When Keifuku Electric Railroad operated the train line, around 8,300 people a day used the line, but after train service was suspended, buses could not handle that number of passengers, and the number gradually declined, ultimately falling to around 30% of the original figure. This shows that buses cannot replace railroads.

In addition, the suspension of train service forced many people who normally used the railroad to change how they got around and limited their activities away from home. For example, some people were forced to drive themselves or have family members or other people drive them. These people were able to respond to the situation by changing their mode of transportation. The more serious situation was for people who were forced to change their lifestyles, such as not going out, reducing trips away from home, or changing where they went, since they lost their desired mode of transportation; this resulted in a decline in the quality of life.

At the same time, people who did not normally use the railroad also became aware that the suspension of service had a negative impact on them. A majority of people who live along the train line do not use the train, but overall, around one-third of these people felt that they were somehow negatively impacted by the suspension in service. This negative impact had various manifestations including the actual burden of having to drive people around, greater concern about family members who had to find a different mode of transportation, and a decrease in peace of mind due to the lost of an alternative mode of transportation.

Due to the actual experiences of these people, interest regarding maintaining the railroad spread and deepened. This was, without doubt, a major driving force behind the decision to maintain the railroad.

● Local support mechanism for rehabilitation/continuation

The debate on how to maintain the railroad was premised on various facts including the following: (1) services were suspended due to a business improvement order; (2) the original railroad company decided to go out of business; (3) there were a large number of local municipalities along the line (initially nine, but ultimately four as a result of mergers) who had varying degrees of interest in maintaining train service, (4) Japan's system of transportation businesses is based on the profitability of the individual company, not the overall economy. There was a fierce debate among the various related parties including Fukui Prefecture, municipalities along the train line, various citizen groups, and numerous business groups. At the root of the

● 運行休止により見えてきた鉄道の価値

突然の運行休止／バス代行という状況に置かれたことによって、沿線住民それぞれが生活者の視線から、鉄道の存在価値、鉄道により得ていた多様な恩恵・便益を、経験を通して認識する機会を得ることとなった。筆者らが行った運行休止／バス代行時の利用者・沿線住民アンケート調査によると、利用者だけでなく様々な人々の生活と鉄道のかかわりが浮かび上がってきた。

京福電鉄運行時に約 8300 人／日程度あった利用者数は、運行休止後の代行バスでは対応しきれず時の経過とともに減り続け、最終的には約 3 割程度にまで利用が落ち込んでしまった。バスでは鉄道にとって代われないことが実証されたわけである。

さらに、休止されたことによって、普段鉄道を利用していた多くの人々は種々の交通行動の変更、外出を伴う生活活動の制約を余儀なくされることとなった。例えば、自分で運転する車利用や家族等に頼る車送迎への変更を強いられることとなった。こうした層は「交通手段の変更」ということで対応し得た。しかし、より深刻だったのは、好ましい移動手段を失ったことによって、「外出を取りやめる」、「外出回数を減らす」、「目的地を変更する」といった生活活動の変更を強いられ、「生活の質」の低下を余儀なくされた層が発生したことである。

同時に、運行休止は、鉄道を普段利用していなかった人々に対しても、種々のマイナスの影響を自覚させることとなった。このことは、沿線において多数を占める非鉄道利用者の約 1/3 が総合的に見て何らかのマイナスの影響を被ったとする意識として現れた。その背景には、送迎といった実質的負担や、鉄道以外の手段を利用しなければならなくなった家族に対する心配の増大、代替手段を失ったことによる安心感の低下等があった。

こうした人々の実感にもとづく鉄道の存在に対する関心の広がりや深まりが、存続という意思決定を導いた大きな推進力となったことは間違いない。

● 存続・再生に向けての地域で支える仕組み

どの様に存続させるかについての議論においては、①改善命令による運行休止という状況、②元鉄道事業者の廃業決定、③沿線 9 市町村（合併により現在は 4 市町）という関連自治体の多さと存続に対する温度差、④経済的ではなく財政的採算性に基づく我が国の交通事業制度等が前提にあった。こうした中で、福井県、沿線市町村、各種市民グループ、商工関係等各種団体といった様々な関連主体間で侃々諤々の議論が展開された。議論の根底には、存続させる場合には安全確保のための多額の投資的経費がかかること、加え

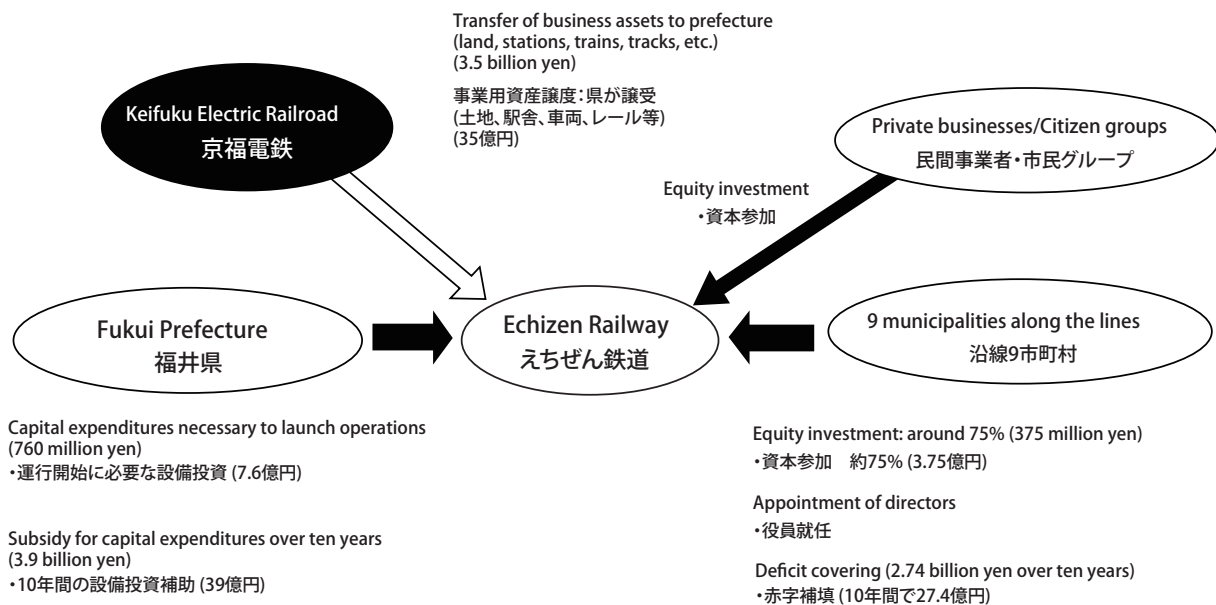


Figure 2: 10-year scheme At Launch of Echizen Railway (agreed to in Jan. 2002)
図2：えちぜん鉄道設立に当たっての10年間のスキーム（2002.1合意）

debate were two issues—the cost of major investments that would be needed to ensure safety if the train line was maintained and the assumption that it would be impossible under current conditions to guarantee the number of passengers to ensure the profitability of the line if it were maintained. The main obstacle to maintaining the line was creating a mechanism to share the costs among the various public bodies.

However, in response to the opinion of various citizen groups and local residents that the train line was an indispensable social infrastructure for the local community, a mechanism, which can be called the Fukui method, was ultimately created (figure 2). Infrastructure (the lower section) was separated from operations (the upper section); therefore, it can be referred to as a vertical separation method. In addition to public bodies, citizens were also able to take part, through public corporations and a citizen support group, in drafting the plan for the new operating company; thus the mechanism was such that it called on the support of the whole local community.

● Appropriateness of public intervention in the railroad business

The introduction of a mechanism that was not bound by the philosophy and system of independent profitability, but involved local public bodies in the railroad business in terms of both financial resources and operation was based on two premises related to the community's experience with no train service. First, it was expected that the railroad would generate external benefits for the local economy. Second, it would act as a substitute (support of public interest) for other public measures related to the environment, welfare, and education (figure 3).

The former refers to the expectation that providing people with multiple modes of transportation and expanding the range of their

て存続させた場合現状の中では採算性を確保しうるだけの利用者を当面確保し得ないことは確実との想定があり、公的主体間の費用負担の仕組みづくりが存続に向けての最大のボトルネックであった。

しかしながら、地域にとって不可欠な社会的インフラであるという種々の市民グループ・地域住民の声を受けて、結果的には「福井方式」といえる仕組みにたどりつくこととなった（図2）。インフラ部分（下部）と運営部分（上部）を分けたという点で上下分離方式といえ、新運営会社に対して公的主体だけでなく、民間企業や市民サポート団体を通しての市民も参画しているという点で、地域全体で支えるという仕組みとなっている。

● 鉄道事業に対する公的関与の妥当性

独立採算制という考え方・制度を超えて、地域の公的主体が財源面・運営面で鉄道事業に関与するという仕組みを導入したのは、運行休止時の経験を踏まえ、一つには鉄道がもたらす外部的地域経済効果への期待、二つには環境・福祉・教育面といった公的施策の代替性（公益支援性）を前提においたと考えられる（図3）。

前者については、人々に多様な移動手段の選択肢を提供し、生活の幅を増大させることを通して、例えば都市中心部ひいては地域全体の活性化への貢献が期待される、あるいは種々の公共施設等の利用促進への寄与が期

Expected external economic benefits and anticipated reduction in public spending
 期待外部経済効果 & 公共投資削減分の先取り

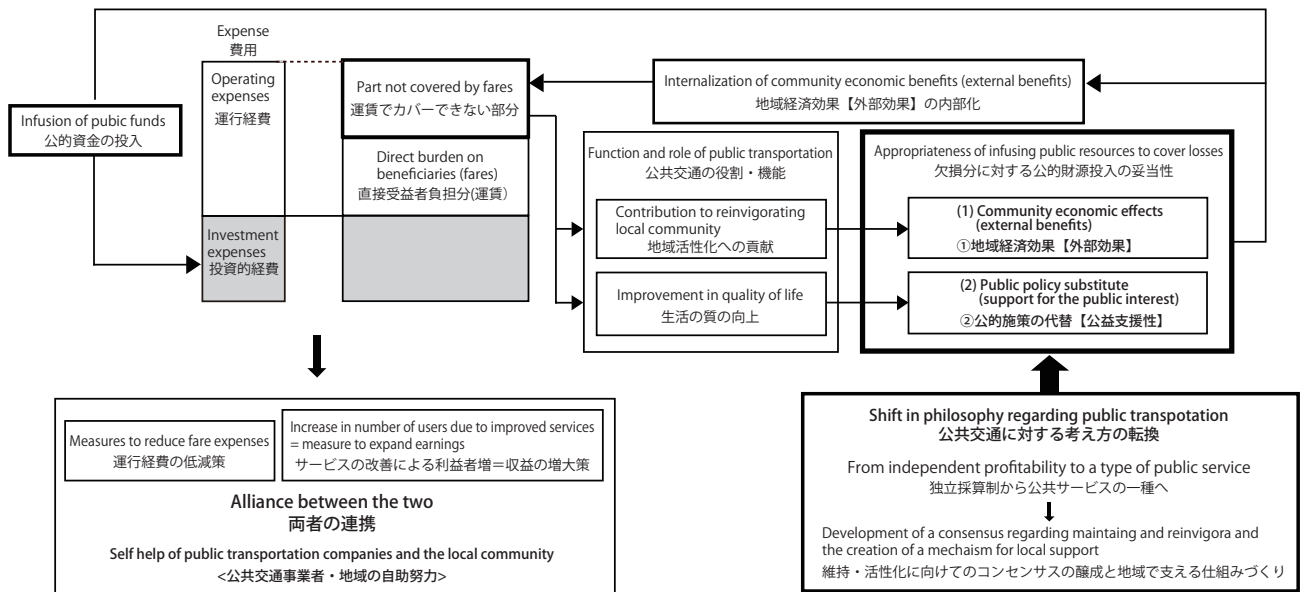


Figure 3: Appropriateness of public involvement in local railroad and local support mechanism
 図3：地方鉄道への公的関与の妥当性と地域で支える仕組み

daily activities would contribute to not only reinvigorating the city center and overall region, but also to promoting the use of various public facilities. Of course, the railroad would not directly generate these externalities, which can be considered social benefits; it was merely the basic requirement to generate these externalities. If efforts, such as coalitions with the local community and urban development generated additional external benefits compared to the time when there was no train service, public-sector intervention could be viewed of as an upfront investment. This means that intervention was considered public investment based on profitability defined in a broad manner, that is, from a perspective of profitability for the whole economy or management of the local community.

The latter would include creating ties to other local administrative measures related to various issues including the environment, welfare, and education in the area around the railroad. If the railroad was important in promoting various other administrative measures, it could be viewed as a facility or business that broadly supports public interests, and public financial support to maintain the railroad could be considered appropriate.

In addition to being expected to generate future social benefits for the overall community, maintaining and rehabilitating the railroad could be viewed as public sector involvement in terms of improving the efficiency of local financial expenditures if looked at from an overall perspective. In this sense, the railroad is truly a social capital for the local community.

待されるといったことである。もちろん、鉄道が存在自体がこうした社会便益ともいえる外部効果を直接生み出すわけではなく、あくまでそのための基礎条件に過ぎない。しかし、地域・まちづくりとの連携等により「鉄道がない」場合に比べてプラスアルファの外部効果を生み出しうるとすれば、それに向けての先取りの投資とみなすことが出来る。広義の採算性、つまり経済的採算性の観点あるいは地域経営的観点にもとづく公的投資と位置づけたことを意味する。

後者については、交通の周辺にある環境や福祉、さらには教育といった他の地域行政施策との関連性に立脚するものであり、様々な行政施策の推進において鉄道を必要とするのであれば、幅広い公益支援性を持つ施設・事業とみなし、その存続に対する公的財政支出の妥当性が認められる。

鉄道の存続・再生は、将来に向けて地域全体にもたらす社会的便益を期待するとともに、総合的にみた場合の地方財政支出の効率化という観点からの公的関与といえ、まさに地域における社会資本として鉄道を位置づけたことを意味する。

● Participation of diverse parties in decision making

Another factor that cannot be overlooked in the process that resulted in the local community deciding to maintain the railroad was the existence of local residents, citizen groups, and various organizations, which consolidated the opinions of local residents and private businesses and had a major impact on the decision as a third force equal to the prefectural assembly and local government. It is extremely significant that the dynamics of bottom-up decision making were introduced, while parties were hesitant to make a top-down decision, and concerns about profitability arose as well as the fact that opposition based on the argument that the railroad was unnecessary assuming a car-based society existed. The experience was also valuable for the local community in that the process was driven not by the government, but by citizen groups that pushed for a decision.

3. Post-rehabilitation efforts and performance—possibility of rehabilitation and reinvigoration

In October 2003, train services on all the Echizen lines were relaunched under a new scheme, but of course, this was not the end of the story. As the railroad was considered an important social infrastructure, it was important that the whole community work together to realize its true value. Since public funds have been poured into the business, the project will be evaluated not on a narrow definition of profitability, but on to what extent external economic benefits are generated, and whether administration becomes more efficient through ties with other public policies such as those related to the environment and welfare. It is necessary to adopt the view that the number of people using the rehabilitated railroad is a gauge of success and that an increase in the number of passengers is one way of measuring whether the excessive use of cars has been remedied and whether a sustainable society has been created in which people can truly live rich lives. From this perspective, what happens after the rehabilitation of the local railroad such as Echizen Railway can be taken as a second forward-looking (positive) trial program.

Looking at the number of passengers up to now reveals that the increase has been greater than initially expected. First of all, this demonstrates that the rehabilitation and revitalization of a railroad is totally possible even in an area that has one of the highest rates of car dependency in Japan.

A breakdown of the increase in passengers by type reveals various facts. First, it has been possible to create a substantial increase in new users through efforts related to both soft and hard aspects of the business, including planning various items in cooperation with parties along the train line, providing new access services, such as P&R and feeder buses, and adding new stations. In addition, residents who live along the train line and had experienced the suspension of service have developed a sense that the railroad is their railroad. That this awareness, combined with the alliance with the local community, improvements in services and a market strategy based on a business philosophy that has never been thought of before, is resulting in an increase in use is significant.

● 意思決定に対する多様な主体の参画

存続という地域としての意思決定に至るプロセスの中で、もう一つ見過ごしてはならない点を挙げるとすれば、地域住民や民間事業者の声を結集し、議会、行政にならぶ第三の勢力として意思決定に大きな影響を及ぼした地域住民、市民グループ、各種団体の存在である。採算性への危惧、車社会を前提とする鉄道不要論が拮抗的に存在し、トップダウン的な意思決定が躊躇されている中に、ボトムアップ的な意思決定の力学を持ち込んだ意義は大きい。行政お膳立て型ではなく、種々の住民グループ自らが主体的に活動を展開し、意思決定に働きかけたということは地域としての有益な経験であったといえる。

3. 再生後の取り組みと実績から～再生・活性化の可能性

2003年10月に現えちぜん鉄道全線が新しい形で運行再開に至ったが、このことがもちろん帰結ではない。重要なことは、将来にわたる重要な社会資本として位置づけた限り、その真価を顕在化させるべく地域一体となって取り組むことにあった。公的財源をつぎ込んだことは、狭義の採算性を評価尺度におくのではなく、いかに外部経済効果を生み出すか、また環境や福祉といった他の公共施策との連携により行政負担を効率化させるかといった点を評価の中心に据えることを意味する。直接的には、再生した鉄道の利用者数そのものを評価尺度に据え、利用者数が増えることが、過度な車利用の適正化、人々の真に豊かな生活の実現や持続可能な地域社会の創造にとっての一つのパラメータであるといった見方を持たなければならない。えちぜん鉄道としての再生後は、こうした視点に立った第2の「前向き（プラス）の社会実験」として捉えられる。

これまでの利用者数推移を見ると、当初の想定数を上方修正するほどの利用状況（増加）を示しており、全国有数といわれる自動車依存地域においても鉄道再生・活性化が十分可能であることを先ずは実証したといえる。

この利用者増の内訳を見ると、沿線と連携した各種企画、新規アクセスサービス（P&R、フィーダーバス等）の提供、新駅の設置等々によるソフト、ハード両面による新規利用者の掘り起こし効果が先ず大きい。加えて、運行休止を経験した沿線住民の中に醸成された鉄道に対する意識（マイルール感）が、今までにない鉄道事業者の経営理念に基づくサービス改善、マーケット戦略、そして地域との連携と相まって利用頻度増に結びついていることが注目される。

From a user perspective, use has increased for numerous reasons. First, using the train makes it possible for people to undertake a wider range of activities (increase in opportunities for people who are unable to drive such as the elderly to leave their home), to do things in different places, and to travel to different locations (increase in opportunities to visit the city center and the area around JR Fukui Station). In addition, a shift away from driving and train use by tourists has also increased the number of users. This supports the initial expectation that the rehabilitation of the railroad would make various contributions, even if only minor, on numerous fronts including welfare (increasing the quality of life for all), revitalization of the city center, the environment, and revitalization of the local region through tourism.

This case also shows that a scheme for active efforts by the railroad company and active participation by public bodies, as well as a sense of local support among the community are indispensable in realizing these objectives.

● Conclusion– Next development

The issue of maintaining or terminating the train service that was forced on the local community was resolved with the creation of a new railroad supported by the local community after having experienced the sudden and unexpected termination of train service. From now on, based on experiences up until now and making the experience of Echizen Railway, which has taken root in the local community to a certain extent the pivot, in conjunction with the current rehabilitation of the Fukui line of the Fukui Railway - another local railroad that is currently working to rehabilitate and revitalize operations - it is necessary to build a public transportation system that has the ability to guide the development of a concentrated urban structure, such as an LRT. The road ahead is long, and there are likely many hurdles to overcome, but I would like to view this as a third trial program for the whole local community.

利用者側からみると、えちぜん鉄道利用による生活活動の拡大（高齢者等車利用不可能層の外出機会の創出）、活動場所・目的地の変更（中心市街地（JR 福井駅周辺）への訪問機会増）、そして車利用からの転換、観光来訪者の利用等が利用増に結びついている。このことは、当初期待した、生活の質の公平な向上といった福祉面、中心市街地活性化面、環境面、さらには観光といった地域振興面に少なからず寄与し得ることを裏付けている。

同時に、そのためには「鉄道事業者による積極的取り組みと公的主体の積極的関与」というスキームと「地域で支える」という人々の意識が不可欠であることをも示したといえる。

● おわりに～次なる展開へ

地域に投げかけられた鉄道の存廃問題は、突然の運行休止という予期せぬ事態を経験することを経て、地域で支える新しい鉄道（えちぜん鉄道）の再生という決着に至った。これからは、これまでの経験を糧に、一応の定着化を成したえちぜん鉄道を軸に、もう一つの地方鉄道であり、現在再生・活性化に取り組んでいる福井鉄道・福武線の再生と併せて、集約型都市構造を誘導し得るほどのパフォーマンスを有する公共交通体系（LRT化等）を先導的に構築することが求められる。先は長く、幾多のハードルが想定されるが、地域を挙げての「第3の社会実験」が始まったと見たい。

Toyama City's Public Transportation Centered Urban Development Policy

富山市の公共交通を軸としたまちづくり政策

Jun Nomura / Director, City Improvement Department, Toyama City

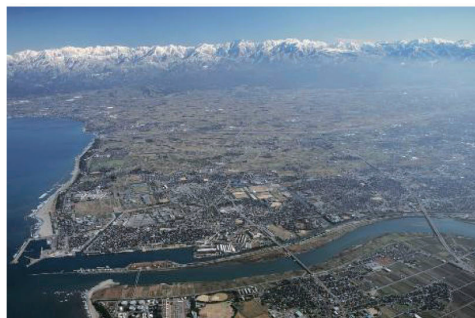
野村 潤 / 富山市都市整備部部长

1. Introduction

Toyama City is located centrally on the eastern side of Honshu, the main island of Japan. The city possesses abundant nature with Toyama Bay to the north and the Tateyama Mountain Range, a series of mountains around 3,000 m tall, to the south.

Since the Meiji Period, the city has served as the provincial capital and developed as a commercial and industrial city with an extensive electric generation infrastructure, including the first hydroelectric power plant in the Hokuriku region. However, air raids near the end of the Pacific War, in August 1945, inflicted devastating damage on the city.

After the war, as a result of efforts to redevelop industry and commerce and to construct numerous types of social infrastructure including roads, parks, and a water supply and sewage system, Toyama City grew into one of the core cities on the Sea of Japan, the side of Japan with a population of 420 thousand people.



Toyama City surrounded by Toyama Bay and the Tateyama Mountain Range
富山湾と立山連峰に囲まれた富山市

2. Toyama City-present state and issues

As the economy grew following the end of the war, so did the population of Toyama City. However, after peaking in 2005, the population is projected to shrink by around 20% compared to the 2005 value over the coming 30 years, through 2040.

In addition, the graying of society has become a serious issue, and it is expected that one out of every three residents will be 65 years or older in 2035.

In addition to these social trends, the city is facing the following three major issues:

(1) Falling population density in urban areas

Until recently, Toyama City has seen its urban areas encroach into suburban areas for numerous reasons including the flat topography, large habitable land area, strong inclination toward home

1. はじめに

富山市は本州の日本海側、ほぼ中央に位置し、北は富山湾、南は3,000メートル級の山々が連なる立山連峰を有する自然豊かな都市である。

明治期以降、県庁所在都市として北陸初の水力発電所が建設されるなど、豊かな電力を基盤として商工業の町として発展をとげた。しかし、太平洋戦争の末期、1945年8月に空襲に遭い市街地は壊滅的な被害を受けた。

戦後、再び商工業の発展や道路、公園、上下水道などの社会インフラの整備に取りくんた結果、人口42万人を有する日本海側有数の中核都市となった。

2. 富山市の現状と課題

本市は、戦後の経済成長とともに居住人口が年々増加してきたが、2005年をピークとして減少に転じ、約30年後の2040年には2005年比で居住人口が約20%減少すると予測している。

さらに、高齢化も深刻な課題であり、2035年には3人に1人が65歳以上の高齢者となると予測している。

こうした、社会情勢とともに、本市では大きく次の3つの都市の課題を抱えている。

(1) 市街地の低密度化

富山市は、平坦な地形で可住面積が広いことや、高い持家志向、道路整備率の高さなどから、これまで郊外部に向かって市街地が

ownership, and an extensive road network. As a result, between 1970 and 2005, the area designated as densely inhabited districts (DID) almost doubled. However, the population density has declined from 59.9 people/hectare to 40.3 people/hectare, which is the lowest value for a prefectural capital.

In addition, if the population density of urban areas continues to decline as it has, maintenance costs for urban infrastructure, including roads and parks, are expected to increase, and it is feared that if tax revenues decline due to the graying of society and shrinking productive population, this could have a major impact on city management.

拡大し、1970年から2005年までの35年間で、DID面積は約2倍に増加している。しかし、人口密度は59.9人/haから40.3人/haまでに減少し、県庁所在都市では最も低い値となっている。(図1)

また、市街地の低密度化がこのまま進行すれば、道路や公園等の都市施設の管理コストの増大が予想され、今後の高齢化とともに生産年齢人口の減少により、税収が減少すれば都市経営にも大きな影響を与えることが危惧されている。

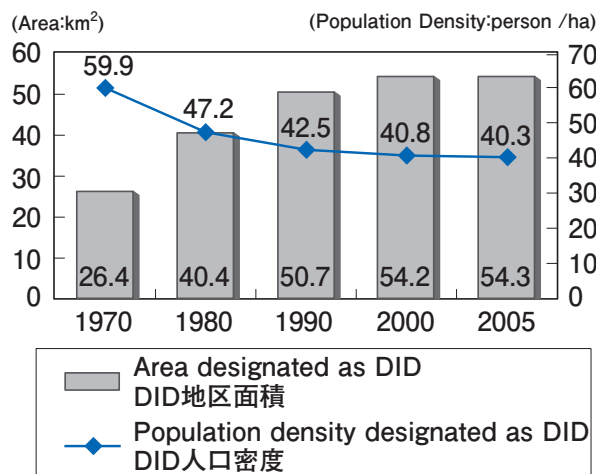


Figure 1: Transition of area and population density designated as DID
図1: DID 面積と DID 人口密度の推移

(2) Over dependence on cars and a decline in public transportation

In 2008, the average number of cars per household for Toyama City was 1.72, the second highest figure for a prefectural capital in Japan. In addition, 71.8% of urban roads authorized in the city plan were completed by 2007, and every year cars are accounting for a larger and larger percentage of transportation, reaching 72.2% according to a 1999 PT survey. Toyama City has grown into a city that is overly dependent on cars for transportation (figure 2).

As the city has become overly dependent on cars, there has been terrible decay in public transportation; the number of people using rail transportation such as private railroads or trolleys has shrunken more than 40% over the 15 years between 1989 and 2004, and bus users have fallen 67% (figure 3).

(3) Decline of city centers

Over the past ten years, the population has fallen 12% and pedestrian traffic declined 70% in the city center. The number of stores and value of retail sales continues to decline, and there are concerns that this decline in the city center will undercut the strength and attractiveness of the overall city.

(2) 過度な自動車依存と公共交通の衰退

富山市では、1世帯あたりの乗用車保有台数が1.72台(2008年)と全国の県庁所在都市で第2位、また、都市計画道路の整備率も71.8%(2007年)と高く、さらに、交通分担率における自動車利用が年々増加し1999年のPT調査では72.2%となり、過度に自動車交通に依存した都市となっている。(図2)

こうした過度な自動車依存の一方で、公共交通の衰退には目を覆うものがあり、私鉄や路面電車の鉄軌道系の利用者は、1989年から2004年までの15年間に40%以上減少し、路線バスの利用者に至っては67%も減少した。(図3)

(3) 中心市街地の衰退

中心市街地では過去10年で人口が約12%、歩行者交通量が70%減少し、店舗数や小売販売額の減少に歯止めがかからない状況であり、中心市街地の衰退により都市全体の活力と魅力の低下が危惧されている。

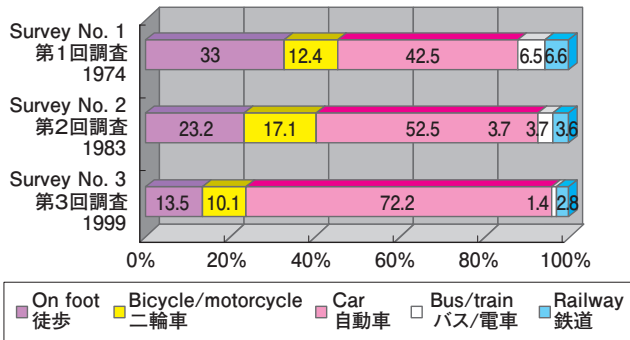


Figure 2: Share of total transportation by mode
 図 2 : 交通手段分担率の推移

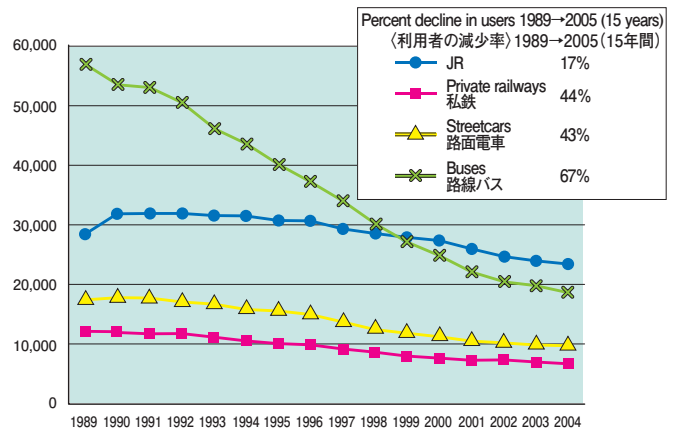


Figure 3: Number of people using public Transportation
 図 3 : 公共交通利用者の推移

2. Setting a city master plan

(1) Toyama-style compact urban development— basic policy

There are concerns that problems including growing administrative management costs, over dependence on cars, and the hollowing out of the city center will become more serious for Toyama City as society grays and the population shrinks. Therefore, the city adopted a basic policy of compact urban development with local community hubs that invigorate public transportation including rail service and concentrate various activities such as living, commerce, and business, along transportation lines. The goal is to create an efficient, sustainable city in which residents do not need to depend on cars and can live securely (figure 4).

(2) Urban plan strategy

In the city master plan created in 2008, six rail lines and 24 main bus lines were designated as the “core public transportation”, the skeleton of the city. In addition, with the objective of making use of

2. 都市マスタープランの策定

(1) 富山型コンパクトなまちづくりの基本方針

富山市では、人口減少や高齢化の進展により行政管理コストの増大、過度な自動車依存、中心市街地の空洞化などの課題はさらに深刻化すると懸念されることから、鉄軌道をはじめとする公共交通を活性化させ、その沿線に居住、商業、業務等の機能が集積した地域拠点型のコンパクトなまちづくりを基本方針としており、自動車に頼らなくても安心して暮らせる効率的で持続可能なまちづくりを目指すこととしている。(図 4)

(2) 都市計画の戦略

2008年に策定した都市マスタープランでは、市内の公共交通のうち鉄軌道6路線と、路線バスのうち幹線バス路線24路線を都市の骨格となる「公共交通軸」に位置づけた。

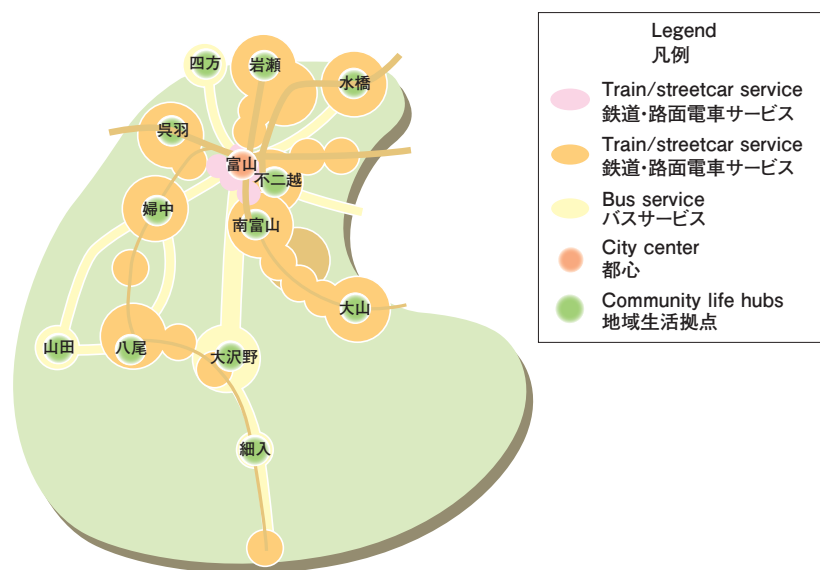


Figure 4: Urban structure Toyama City is striving for
 図 4 : 富山市が目指すお団子と串の都市構造イメージ

the current concentration of city functions, 14 areas were established as “community life hubs” in which the various facilities necessary for daily life such as retail stores, medical facilities, financial institutions, and post offices are within walking distance. Furthermore, a decision was made to designate areas within 500 meters of railroad stations and 300 meters of bus stops on lines considered core public transportation as “residential promotion zones along core public transportation” and to promote residential housing. These correspond to “urbanization zones” stipulated in the City Planning Act, areas to promote urbanization, as well as residence promotion zones, which can be considered the first such attempt within Japan.

(3) Promoting compact urban development

Toyama City is using the following methods to promote urban development that will result in the desired urban structure.

① Adopting a basic policy of encouragement not regulation

Regulatory methods such as creating new areas that constrain urbanization are not suited for situations when the population is shrinking and a city is in decay; therefore Toyama City’s basic policy is to employ inducements to increase the number of citizens who want to live in the area by increasing daily convenience within an area accessible on foot, centered on facilities such as stations.

② Providing residents with a choice to live in either an urban or suburban area

By creating an environment in which residents can choose to either live in the city or in the suburbs through various efforts such as raising the attractiveness of the city and supplying quality apartments, the number of residents choosing to live in the city will increase in the medium and long term, leading the city to develop into a compact form.

③ Promoting compact urban development by invigorating public transportation

Toyama City is blessed with an existing transportation system, including a railroad network and buses, and by invigorating this system through appropriate involvement, the government will promote residential housing and the concentration of urban functions necessary for daily living within walking distance of train stations and buses.

④ Promoting compact urban development by creating hubs in each area

Compact urban development refers to not only creating a compact city center, but also establishing community life hubs, which will become the core areas along public transportation lines; thus promoting compact urban development throughout the city.

また、既存の都市機能の集積を活かす趣旨から、小売業や医療施設、金融・郵便サービスなどの生活利便施設が徒歩圏の範囲にまとまっている 14 地区を「地域生活拠点」に設定した。

さらに、「公共交通軸」の鉄道駅から概ね 500m、バス停からは概ね 300m を「公共交通沿線居住推進地区」に設定し、居住を推進することとした。

このことは都市計画法上で市街化を促進する区域である「市街化区域」のほかに、居住を推進する区域を指定したものであり、我が国初の試みといえる。

(3) コンパクトなまちづくりの進め方

本市が目指す都市構造を実現するまちづくりの進め方は以下のとおりとする。

①規制強化ではなく、誘導的手法が基本

人口が減少し、都市が縮退する際には市街化を抑制する区域を新たに設定するといった規制的手法は馴染まないことから、駅等を中心とした徒歩圏の生活利便性を向上することで、そこに住みたいと思える市民を増やしていく誘導的手法が基本となる。

②市民がまちなか居住か郊外居住かを選択できるようにする

まちなかの魅力の向上や優良な集合住宅の供給などにより、市民がまちなか居住か郊外居住かを選択できる環境を整備して、中長期的にはまちなかを選択する市民が増え、まちがコンパクト化していく方向へ誘導する。

③公共交通を活性化によるコンパクトなまちづくりを推進

既存の恵まれた鉄軌道網やバス等に、行政が適切な関与をして活性化し、駅やバス停の徒歩圏に居住を推進するとともに生活に必要な都市機能の集積を図る。

④各地域での拠点の整備により全市的にコンパクトなまちづくりを推進

コンパクトなまちづくりは都心部だけをコンパクトにするのではなく、公共交通沿線の地域の核となる生活拠点を整備し、全市的にコンパクトなまちづくりを推進する。

3. Measures to encourage people toward a compact city

(1) Reinvigorating core public transportation

① Create an LRT network

Toyama City is blessed with a relatively good rail network compared to other provincial cities, and efforts such as improving stops and introducing light rail vehicles (LRV) on trolley lines and railroads will be promoted on the existing rail network. In addition, a light rail train (LRT) network will be created that extends around 25.3 km. (figure 5)

② Establish Toyama Light Rail

Based on the idea of operating unprofitable local lines as public infrastructure, these lines were restructured into the Toyama Light Rail, the first full LRT in Japan. Service was launched in April 2006.

The number of users has more than doubled since the LRT was introduced, and many residents make use of the trains.

③ Launch an intra-city loop line

In order to achieve several objectives including improving the navigability of the city center and creating a transportation network for the future, an intra-city loop line, which includes 900 meters of newly laid track, was build and is now in operation. This was the first new train line in Japan for 58 years.

(2) Making the city center more attractive

3. コンパクトな街への誘導施策

(1) 公共交通軸の活性化

① LRT ネットワークの形成

本市は、地方都市の中では比較的恵まれた鉄軌道網があることから、これらを活用して路面電車や鉄道などで、電停のハイグレード化や LRV の導入などを進め、延長約 25.3km にわたる LRT ネットワークの形成を図る。(図 5)

② 富山ライトレールの整備

富山ライトレールは、赤字が続くローカル線を公設民営の考え方により、我が国初の本格的 LRT「富山ライトレール」として再生したもので、2006 年 4 月に開業した。

利用者数は整備前に比べて 2 倍以上に増加し、多くの市民に利用されている。

③ 市内電車環状線化事業

市内電車環状線は、都心部の回遊性の向上や、将来の交通ネットワークの形成などを目的として、新たに約 900m 軌道を新設し、新規路線として運行を開始したものである。我が国の軌道の新規路線としては 58 年ぶりの開業となる。

(2) 中心市街地の魅力向上

中心市街地はかつて商業の中心として、書

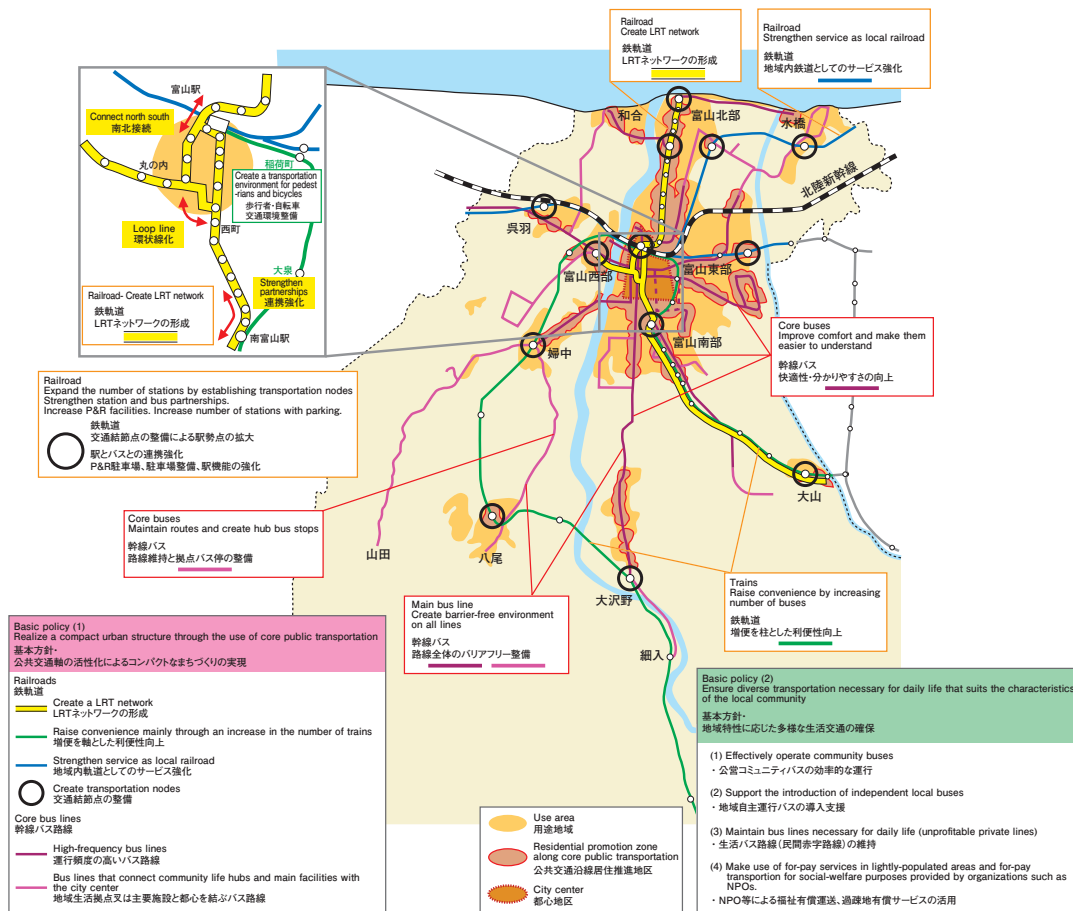


Figure 5: Conceptual diagram for reinvigorating Toyama City's public transportation

図 5: 富山市公共交通活性化構想図



Toyama Light Rail
富山ライトレール



Intra-city Loop Line
市内電車環状線



Grand Plaza
グランドプラザ

As the center of commerce, the city center used to be a bustling area with numerous businesses including movie theaters and various types of stores, such as books stores, music stores, and high-end clothing and food stores. Recently, the number of people visiting the city center has declined due to the construction of large-scale stores in the suburbs and the diversification of how people spend their leisure time. This has robbed the city center of its former vigor.

However, the city center is not only the face of the city, but also an area that generated a certain amount of tax revenue due to its strong economic activity; therefore, this area is the most important for Toyama City to create the desired urban structure.

Until now, Toyama City's center has lacked a plaza-like space where residents can gather, much like those often seen in European cities; therefore the Grand Plaza, a roofed plaza often referred to as a galleria, was built on a 1,400m² site, and is used as a grand location for major events.

(3) Promoting residential housing with the goal of a compact city

Within Toyama City, two areas have been established as residential housing promotion zones—(1) an approximately 436-hectare “city center” and (2) a roughly 3,053-hectare “residential promotion zone along core public transportation”. Two subsidies have been introduced as measures to support the residential housing. The two programs are also meaningful as broad messages to residents that clarify the city's philosophy and policies on encouraging housing. Since the systems were introduced in 2005, subsidies have been provided for around 400 instances.

店や CD ショップなどの日用品から映画館や高級服飾品店などの多様な店舗が立地し賑わいを呈していた。しかし、近年、郊外における大規模店舗の立地やレジャーの多様化などを背景に来街者が減少し、かつての賑わいが失われている。

しかしながら、中心市街地は都市の「顔」であるとともに、活発な経済活動によって一定の税収を生んできた地区であり、本市が目指す都市構造を実現する上で最も重要な地区である。

これまで、本市の中心市街地にはヨーロッパの都市に見られるような市民が集える広場空間がなかったことから、約 1,400m² の敷地に大屋根（ガレリア）のある広場、「グランドプラザ」を整備し、賑わいイベントが開催できる「ハレ」の場とすることとした。

(3) コンパクトなまちに向けた居住誘導

本市では、居住を推進する地区として①約 436ha の「都心部」と、②約 3,053ha の「公共交通沿線居住推進地区」を設定しており、居住支援施策として、2 つの補助制度を設けている。また、この補助制度は本市の居住誘導の考え方や方針を明確にして、広く市民に PR するという意味もあり 2005 年の制度開始以降、約 400 件の補助を行っている。

<Residential Housing Promotion Subsidy System>

<居住誘導補助制度>

	Subsidies for citizens 市民向けの助成	Subsidies for construction companies 建設事業者向けの支援
(1) Target: city center; Urban Residential Housing Promotion Project is a support system for residential housing and the construction of apartment and condominium complexes in the city center, etc.	<ul style="list-style-type: none"> • Subsidy of 500,000 yen per unit for purchasing a detached home or condominium • Rent subsidy of 10,000/month (for three years) for families that move into the city center zone 	<ul style="list-style-type: none"> • Subsidy of 1,000,000 yen per unit for constructing condominium or apartment complexes • Subsidy of 50,000 yen per unit for constructing quality rental housing • Subsidy of 1,000,000 yen per unit for transforming an office/commercial building into a condominium or apartment complex • Subsidy of 20,000 yen per square-meter for constructing structures such as stores or medical and welfare facilities attached to condominium or apartment complexes
① 「都心部」が対象区域 「まちなか居住推進事業」 ⇒都心地区での居住や、共同住宅建設などへの支援制度	<ul style="list-style-type: none"> • 戸建て住宅または、共同住宅の購入費等 50 万円/戸 • 都心地区への転居による家賃助成 1 万円/月 (3 年間) 	<ul style="list-style-type: none"> • 共同住宅の建設費への助成 100 万円/戸 • 優良賃貸住宅の建設費への助成 50 万円/戸 • 業務・商業ビルから共同住宅への改修費助成 100 万円/戸 • 共同住宅に設置する店舗、医療、福祉施設等の整備費用への助成 2 万円/m²
(2) Target: residential promotion zones along core public transportation; The Residential Promotion Zone Along Core Public Transportation Project is a support system for residential housing and construction of apartment and condominium complexes in the zone	<ul style="list-style-type: none"> • Subsidy of 300,000 yen per unit for purchasing a detached home or condominium • Subsidy of 100,000 yen per household when a household moves into the zone from a two-household home or outside zone 	<ul style="list-style-type: none"> • Subsidy of 70,000 yen per unit for constructing a condominium or apartment complex
② 「公共交通沿線居住推進地区」が対象区域 「公共交通沿線居住推進事業」 ⇒公共交通沿線居住推進地区での居住や、共同住宅建設などへの支援制度	<ul style="list-style-type: none"> • 戸建て住宅または、共同住宅の購入費等 30 万円/戸 • 2 世帯住宅や区域外からの転入の場合はそれぞれ上乗せ補助 10 万円/戸 	<ul style="list-style-type: none"> • 共同住宅の建設費への助成 70 万円/戸

4. Conclusion

Until now, Toyama City has grown as the economy has expanded, but the city will enter a period of maturity and then decline, shrinking the population.

The city is currently in that transition period, and it is important to promote urban development by clarifying what the city should and wants to become after making clear the current state of and the issues faced by the city.

Toyama City is moving toward compact urban development in order to provide efficient and quality administrative services and to create a sustainable city that is environmentally friendly and people can live in securely. The city wants to work with citizens to realize the desired city structure and would like to promote policies that are new and innovative, not bound by existing ideas.

4. まとめ

これまで本市は、経済成長とともに都市が拡大してきたが、今後は本格的な人口減少時代に突入し、成熟期、そして縮退期に入っていく。

現在はその転換期にあり、今こそ都市の現状や課題を明確にした上で、将来のあるべき姿、目指すべき都市像を明らかにしてまちづくりを推進していかなければならない。

本市は、今後とも効率的で質の高い行政サービスを提供し、環境にも優しく、誰もが安心して暮らせる持続可能な都市を実現するため、コンパクトなまちづくりの実現に舵を切った。今後とも、市民とともに目指すべき都市構造の実現に向けて取り組む考えであり、既存概念にとらわれない、新たな知恵と発想で都市政策を推進していきたい。

Parking Deposit System—A Highly Rational and Acceptable Policy for Controlling the Inflow of Cars into City Centers

合理性と受容性の高い都心部自動車流入抑制策“Parking Deposit System”の提案

Takayuki Morikawa / Professor, Graduate School of Environmental Studies, Nagoya University

森川 高行 / 名古屋大学大学院教授

● What is the parking deposit system (PDS)?

As the development of cities and transportation systems that are sustainable in terms of both the environment and energy has become an urgent issue throughout the world, there has been a growing trend toward restricting the inflow of cars into cities. Road pricing (RP), a fee system for driving into the city centers, has drawn attention as one method to rationally control the inflow of cars into city centers that are plagued by extremely heavy traffic. Having introduced the system in 1975, Singapore has employed such a system for the longest time; a fee of around 300 yen during peak periods on weekdays is charged when a car enters the city center. London has operated such a system since 2003, and people using a car within a 22km² area centered on the heart of the city, which is rather extensive, must pay a fairly high “congestion charge” of 8 pounds (around 1,600 yen at an exchange rate of 200 yen/pound). As a result, traffic in the city center has declined by around 45% for Singapore and 35% for London. A similar system was also introduced in Stockholm, and it is reported that traffic into the city center has fallen around 20% as expected.

In Japan, areas including the central wards of Tokyo and Nagoya City have shown a desire to introduce such a system, but a major issue is whether society would accept the system, and efforts have not yet progressed to the actual examination stage. Not only have the transportation industry and general citizens, who feel that there is already a heavy tax burden on car use, balked at the idea, but businesses located in the city center, whose very existence could be impacted by a decline in customers, are also opposed to the system. There are even concerns among parties involved with urban development, who abhor decay in central urban areas.

Taking into consideration the importance of increasing acceptability by society, having a parking deposit system (PDS) as an alternative to road pricing, is suggested. With a PDS, a set fee is charged for driving into the restricted access area, but part or the whole amount of the fee can be applied to parking or shopping at stores within the area (figure 1). I was inspired by the deposit system for drink containers, in which a deposit is paid when purchasing the drink, but the deposit is repaid when the empty container is returned. For drivers who simply pass through the area or park illegally, the system would have the same impact as road pricing, but “customers” contributing to the economic activity of the city center would pay no or a minor fee. This could also be expected to make it easier to gain agreement from citizens and businesses located in the city center. In this article, a summary of research related to PDS, which has been spearheaded by this research institute is provided.

● 駐車デポジットシステム (PDS) とは

環境・エネルギー的に持続可能な都市・交通システムが世界中で喫緊の課題となっている中、都市への自動車の流入を抑制する動きが加速している。なかでも、渋滞の激しい都心部への車の流入を合理的にコントロールできる都心部乗入れ課金(ロードプライシング)制度が注目されている。最も長い歴史があるシンガポールでは、1975年から実施されており、車が都心部に入る際に、平日のピーク時で300円程度の料金を課している。ロンドンでは2003年から「混雑課金」として実施されており、都心部22km²程度の広い範囲で車を利用する際には8ポンド(1ポンド200円で考えると1600円)という高額な料金を課している。効果としては、シンガポールで約45%、ロンドンで約35%、都心部の交通量が減少した。ストックホルムでも開始しており、流入交通量がやはり20%程度減少していると報告されている。

我が国においても、東京都区部、名古屋市などが実施に意欲を見せたが、社会的受容性の課題が大きく、具体的な検討にまで進んでいない。自動車利用に対する重税感をすでに持つ一般市民や運輸業界の反発、顧客減少が死活問題となる都心部事業者の反対、そして中心市街地の衰退を嫌う街づくり関係者たちの懸念などの反対意見がある。

そこで著者は、より高い社会的受容性の必要性を考え、通常のロードプライシングに代わる「駐車デポジットシステム (Parking Deposit System; PDS)」を提案している。PDSは、規制エリアに車が入るときに一定額を乗入れ課金として徴収するが、エリア内で駐車したり店舗で買物した際にその課金額の全部または一部をその支払いに充当するという制度である(図1)。飲料の容器にあらかじめ一時預かり金(デポジット)を加えて販売し、容器を返したときにデポジットが戻ってくる仕組みからヒントを得ている。この制度では、エリアを通過するだけの車や違法駐車する車にはロードプライシングと同様の効果を持つが、都心で経済活動する「お客さま」にはまったく課金されないかまたは少額しか課金されないことになる。このため市民や都心部事業者からの合意も得やすくなると期待される。本稿では当研究室が中心になって実施したPDSに関する研究成果の概要について報告する。

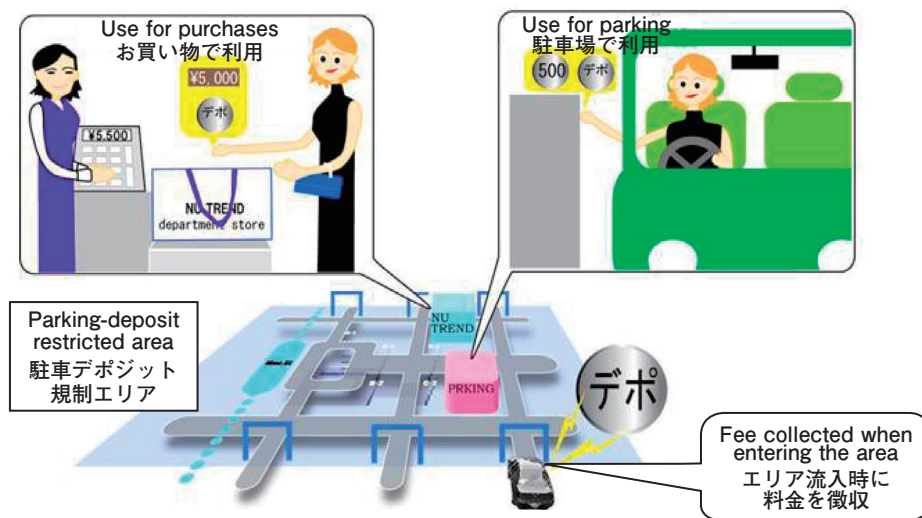


Figure 1: PDS mechanism
図 1 : PDS の仕組み

● Acceptability of RP and PDS—survey results

According to a survey of 1,300 citizens conducted by the research institute, while only 42.5% of respondents supported RP, a majority (52.7%) supported a PDS. Similar results were obtained from a survey of 452 businesses who mainly operate in the city center—43.2% supported RP and 57.3% supported a PDS system. This reveals that it would also be easier to gain the support of businesses for a PDS.

● Benefits of introducing a PDS—Simulation

As a preliminary evaluation of RP and PDS, demand using a combined network equilibrium model broken down by hour, which makes it possible to depict road congestion by reproducing the volume of traffic on roads in one hour increments, was analyzed. In order to model the choice of transportation, destination, and activities for a particular hour after taking into consideration changes in the required travel time due to congestion, a simulation of changes in traffic volume into the city center for different fee and congestion levels was run.

As a case study, a simulation was run of changes in people's movement within the greater Nagoya metropolitan area using a person-trip survey, assuming a restricted access area of around 25 km², centered on the heart of Nagoya City. Simulations were run for a total of 19 patterns, covering various combinations of initial fees and refunds. For example, case 5-3 refers to an initial fee of 500 yen and a refund of 300 yen.

The left-hand side of figure 2 shows the number of trips to the restricted access area broken down by purpose of trip, while the right-hand side shows the number of trips broken down by transportation mode. Case 0 is the current state with no fee. For a pure RP with no refund, the number of visitors to the area fell by around 5%; however, the decline was dramatically reduced by using a PDS. The simulation also makes it clear that for both RP and PDS, the number of people

● アンケート結果にみる RP と PDS の受容性

研究会が実施した市民 1300 人に対するアンケート調査では、RP の賛成率は 42.5% に留まったのに対して、PDS の賛成率は 52.7% と過半数となった。また、都心部事業者を中心に 452 社に対して行なった事業者アンケート調査も同様な結果を示しており、RP の賛成率 43.2%、PDS の賛成率 57.3% となった。このように、PDS は都心部の事業者からも賛同を得やすいことが特徴といえる。

● シミュレーションによる PDS の導入評価

RP 及び PDS の事前評価を行うために需要分析を行なった。使用した分析手法は、時間帯別統合型ネットワーク均衡モデルと呼ばれるもので、1 時間帯ごとの道路の交通量を再現するので道路の混雑を表現することができる。混雑による道路の所要時間の変化を考慮したうえで、交通手段の選択、目的地の選択、その時間帯に何をするかを選択（活動選択）をモデル化するため、課金額や混雑状況の変化による都心部への交通量の変化をシミュレートすることができる。

事例研究として名古屋市都心部の約 25km² を規制エリアとし、パーソントリップ調査における中京都市圏の人々の行動変化をシミュレートした。課金額のケースとして、初期課金額と返金額の組み合わせで 19 パターンに対してシミュレーションを行った。例えば「ケース 5-3」というのは、課金額 500 円、返金額 300 円という意味である。

図 2 の左側は、規制エリアを目的地とするトリップ数をトリップ目的別に示したものである。右側は代表交通手段別に示したものである。ケース 0 は課金がまったくない現状を表している。返金のない単純な RP では規制エリアを訪問する人が 5% 程度減少するが、PDS ではこの減少割合がかなり緩和されることが分かる。また、RP でも PDS で

Concentrated volume by purpose/transportation mode (12:00 noon)
 移動目的別 / 交通手段別集中量 (昼間 12 時間)

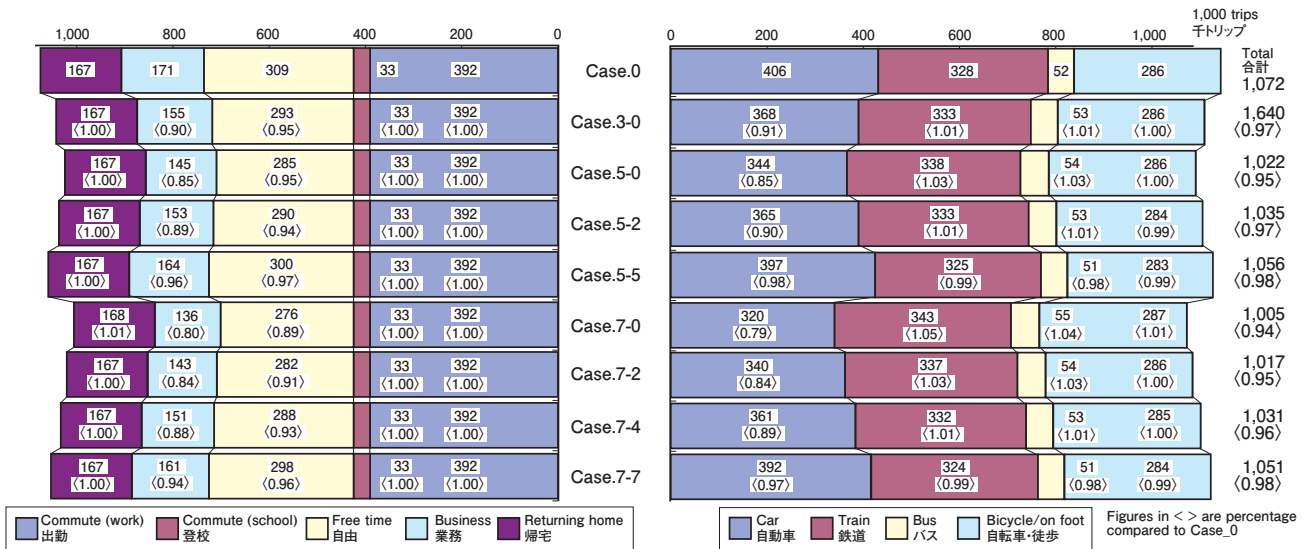


Figure 2: Number of trips to and from the restricted access area
 図 2 規制エリアを発着するトリップ数

driving into the area declines, but the number of visitors to the area who use public transportation increases.

It would be possible to reduce the volume of traffic that simply passes through the restricted assess area by around 70-90% using either RP or PDS, thus substantially reducing unnecessary traffic in the congested city center. Almost all loss time due to traffic jams is eliminated in the restricted access area, and for the overall Nagoya City, time loss due to traffic jams shrank 10-20%. An effect of a decrease in CO₂ emissions of around 15% in the restricted access area and several percent points for the overall Nagoya area was discovered.

● PDS Pilot Program

A PDS field test was run in FY2008. Since during the research stage, it is impossible in terms of a system and cost to actually install antennas and gates on roads heading into the city center, the institute conducted a field test using GPS-enabled mobile phones provided to monitors. The test was run by using GPS-enabled mobile phones with specially installed software in conjunction with an Internet server, confirming the location of monitors to determine if they entered or left the restricted access area, providing information on fees and refunds, automatically recording the movement of individuals and making after-the-fact revisions, and using an account function to manage fees and refunds. The actual test lasted four weeks--there was a two-week preliminary test in which normal traffic movement was measured and recorded before the PDS was introduced and a two-week test after the PDS was introduced, and it was conducted twice with different monitors each time.

The restricted access area that drivers were required to pay a deposit to enter was the same as that used for the simulation--a 25-km² area centered on the heart of Nagoya City. A deposit was col-

も車での訪問が減少し、公共交通機関の利用が増えることが分かる。

規制エリア内の通過交通量は、RP でも PDS でも通過交通を 70 ~ 90%削減することが可能であり、混雑する都心部を通過する無駄な自動車交通を激減させる効果がある。渋滞による時間損失は規制エリア内ではほとんどなくなり、名古屋市全体でも 10 ~ 20 %程度の渋滞損失時間が減少する。CO₂ 排出量では規制エリア内で約 15%の減少、名古屋市全体でも数%減少させる効果があることが分かった。

● PDS 社会実験

平成 20 年度には、PDS の社会実験を実施した。研究開発段階においては、実際の都心の流入部にアンテナやゲートを設置することは制度的にも費用的にも不可能であるため、研究会では、募集したモニターを対象に、GPS 携帯電話を利用した社会実験を行った。専用ソフトウェアを組み込んだ GPS 携帯電話と Web サーバーを連携させ、課金エリアへの流入流出などの位置情報確認と課金・返金の案内、個人の交通行動日記の自動登録と事後修正、課金返金を管理するアカウント機能などが実装されている。実験では PDS が実施される前の平常時の交通行動を観測・記録する事前調査 (2 週間) と、PDS が実施された後の事後調査 (2 週間) の合計 4 週間の調査を、モニターを入れ替えて 2 回実施した。

課金を行う規制エリアは、シミュレーションによる効果分析時の設定と同じ、名古屋の都心部約 25km² である。課金対象となるのは、自動車及び自動二輪車 (以下、これら

lected when cars and motorcycles, referred to below as vehicles, passed over the boundary line and entered the restricted access area. If monitors did something that was eligible for a refund, such as using pay parking or shopping, the deposit was refunded that same day. If actual deposits were paid and refunds provided in order to analyze changes in behavior, no one would cooperate with the field test since it would impact their pocketbooks. If monitors left their mobile phone at home or turned off the phone when entering the restricted access area in order to avoid paying the deposit, the field test would be meaningless. Therefore, monitors were paid 600 yen each time it was determined that they traveled into the center of the city based on their GPS trail. For the field test, the deposit for entering the restricted access area was set at 500 yen and the refund at 300 yen. Even if monitors traveled through the area and only paid the deposit, they would earn 100 yen. A total of 48 monitors took part in the field test--28 for the first field test and 48 for the second.

Changes in the number of trips to the city center between the preliminary survey and post-introduction survey (after the PDS was introduced) are shown in table 1. Looking at the row labeled "total", the number of post-introduction trips rose around 20%. The number of people visiting the city center increased 26% and those traveling to the city center by public transportation rose 30%, both of which are greater than the background increase. The field test was able to partially demonstrate that a PDS may not lead to a decline in the number of people visiting the city center unlike normal road pricing. In addition, the number of times people simply drove through the city center declined by 24 trips, or 57%, which translates into an increase of 25 trips around the city center. It appears that more than half of drivers avoided the city center since they disliked paying a fee to pass through the center.

Results for the field test were similar to those from the traffic simu-

を「車」と称する)が課金エリアを囲むコー ドンラインを越えて流入した場合である。その当日にエリア内で、返金対象行動(有料駐 車場での駐車または買い物)があった場合には返金を行う。行動変化を分析するために実 際に課金・返金を行うが、モニターの懐が痛 んでしまっは誰も協力してくれない。また、 課金を避けるために車で流入する際に携帯電 話を自宅においてきたり、電源を切っしま ったりされても実験の意味がない。そこで、 モニターが都心部関連交通を行ったと GPS 軌跡で認定された場合に毎回 600 円の協力 金を支払う。今回の実験での都心部乗入れ課 金額は 500 円、返金額は 300 円と設定して おり、課金だけされた移動の場合でも最低 100 円はモニターの手元に残る勘定になっ ている。モニター数は、第 1 クール 28 名、 第 2 クール 48 名の合計 76 名であった。

表 1 に、事前調査と事後(PDS 実施期間) 調査における都心部関連トリップ数の変化を 示す。合計欄を見ると、事後期間の方が約 20%トリップ数が多いことが分かる。とく に都心部訪問者の増加率は 26%、なかでも 公共交通利用による訪問者は 30%といずれ もバックグラウンドの増加率を越えた伸びを 示した。通常のロードプライシングと異なり、 PDS の実施では都心部訪問者が減少しない 可能性が一部実証できたと思われる。また、 車による都心部通過は 24 トリップ、率で言 うと 57%減少しており、その分都心部迂回 は 25 トリップ増加している。都心部通過に よる純粋課金をきらって迂回する車が半分以 上いるとみることが出来る。

このように、車による通過交通が半減す ること、全交通手段での都心部訪問者は減少

Table 1: Changes in Number of Trips Due to Field Test

表 1：社会実験によるトリップ数の変化

	Preliminary period 事前期間	Period of PDS use PDS 実施期間	% Change 変化率
Visits by cars 車での訪問	269	330	1.23
Visit by public transportation 公共交通での訪問	225	293	1.3
Total visits to city center 都心部訪問合計	494	623	1.26
Passing through by car 車での通過	42	18	0.43
Detour by car 車での迂回	17	42	2.47
Movement within the area エリア内の動き	444	503	1.13
Total for city center 都心部関連合計	997	1186	1.19

lation—a 50% decline in the number of drivers who simply pass through the city center, but no decline in the total number of people visiting the city center using any mode of transportation.

● Conclusion

There are still issues to be overcome such as the lack of a legal framework to collect fees for the use of general roads and how to reliably collect deposits and pay refunds with a system that is not prohibitively expensive, but this research is expected to create movement towards implementing the world's first PDS.

しないことなど、交通シミュレーションによる分析と同様な結果が社会実験によって得られた。

● おわりに

現在の日本では一般道で料金を徴収する法制度がないことと、いかに安価なシステムで信頼性高く課金・返金を行うかという課題が残されているが、本研究開発を通じて世界初の提案である PDS の実現に向けた動きが生じることを期待している。



Figure 5: Current city center (artist's concept)
図 5 : 現在の都心部街路に近いイメージ



Figure 6: City center with emphasis on public transportation and pedestrians (artist's concept)
図 6 : 公共交通と歩行者重視の都心部街路のイメージ