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DEVISING A BUS OPERATING SCHEME IN COOPERATION WITH VARIOUS STAKEHOLDERS*: A CASE STUDY OF THE RAKUNAN EXPRESS IN KYOTO*

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ABSTRACT

In order to establish an urban area with high energy efficiency and little environmental load, a compact city based on public transport is needed. Considering this background, we started bus operation with the cooperation of various stakeholders such as Kinki District Transport Bureau MLIT, Kyoto City, transport service companies, local companies, and the University. In this paper we clarify the significance of various stakeholders participating in the operation of bus service from the planning stage.
We utilize survey results collected from bus passengers in cooperation with stakeholders. We also examine and evaluate the role of each stakeholder related to the development of the route and the timetable, design of buses, activity for usage-promotion, and so on.
Bus passengers are increasing according to various promotional activities and service improvements since the start of bus operation. Based on the outcome of these activities, we can say that cooperation with stakeholders can provide high quality service to bus users.

Keywords: New Bus Operating Scheme, Private-Public-Academic Partnership, Low-carbon Society, Mobility Management, Kyoto City

INTRODUCTION

With the rapid spread of motorization, many urban areas in the world have evolved structures which induce heavy environmental load due to lower density and high energy consumption associated with longer travel distance. In order to improve these issues and realize efficient urban areas with low environmental load, it is necessary to form compact urban areas with public transportation.

Along with the introduction of urban transport such as tram and articulated bus systems in each city, low-carbon urban areas can be devised by way of urban revitalization and connecting residential areas with transport. For these methods it is practical to apply national and regional tax revenues toward public transport maintenance and management. On the other hand, transport maintenance and management in Japan operate under financial independence. It is not that they operate freely within a competitive market, but rather that business is operated under various regulations so that generally transport is operated via regional monopoly. Because of that, the current trend is a vicious cycle of falling ridership making operators unable to invest in service increases, which drives cost-cutting service reductions and results in further ridership losses.

In Japan in 2002, regulations on market entry and withdrawal were introduced to encourage competition, resulting in the ability of operators to enter or withdraw business without regional consultation. However, with a worsening business climate and few new market entries, business reductions and withdrawals increased, resulting in regional public transportation service decline.

In 2009 the Kyoto University Urban Policy Unit for Low Carbon Society (herein referred to as the Unit) was established with the goal of raising talent to create low-carbon cities and public transport policy, along with continuous support of municipal planning/enforcement of urban plans and public transport policy. In cooperation with Kyoto Prefecture, these first five years of talent building with the assistance of Ministry of Education, Culture, Sports, Science and Technology “Creating Local Activate Human Resources Fostering Institutions” program, the Unit aims to be a policy think tank entrusted with research on policy support and enforcement. One of the Unit's projects is the Rakunan Express (R’EX) demonstrative experiment. Following the experiment, the Unit transferred many of its responsibilities to the Kyoto Machizukuri Kotsu Laboratory llc.[*1].

The R’EX bus forms a direct connection between Kyoto Station and the "*Rakunan Shinto*" (highly-integrated business zone). The Rakunan Shinto is a new base in Kyoto for companies and factories focusing on craftsmanship. With local government and business unwilling to invest in introducing new public transportation like subway extensions or high-quality bus routes, the lack of such service has been an impediment to area development (Ministry of Land, Infrastructure, Transport and Tourism, Kinki District Transport Bureau, 2010). Considering this situation, the R’EX project was initiated to guide the way to a future urban structure centered around stations and bus stops with a highly-convenient public transportation service, which would ensure use by commuters and residents alike. With the Unit at the center, the project features many stakeholders in planning such as the Kinki District Transport Bureau MLIT, Kyoto City, transportation operators, and local businesses.

There is a considerable amount of existing research concerning the formulation of compact urban structure and convenience, as well as the reduction of automobile use and environmental load through public transportation. For example, Cervero & Murakami (2010), Nakamichi et. al. (2008), and Handy et al. (2005) have both contributed to the body of literature. Additionally, as has taken place with the Toyama Light Rail project, the regional effects of local residents switching over to public transportation use after initiation can be pronounced (Mochizuki et al., 2008; Matsunaka et al., 2009).

On the other hand, as mentioned above, after fare and vehicle deregulation for buses in 2002, privatization of city buses in the Kyoto area is progressing, where taxi and tour bus companies have initiated public bus service (Inoue, 2006). Furthermore, bus routes facilitated with the cooperation of businesses, like the Kyoto 100 yen City-center Loop bus (Nakagawa et al., 2003), as well as services with many various stakeholders, like the Daigo Community Bus (Nakagawa, 2005) and the Gion/Kawaramachi/Kanko Night Bus (Shimizu et al., 2008), etc., can be seen. At the same time private/academic joint ventures and mobility management groups have progressed toward making public transportation more useful for residents and commuters (Murao & Nakagawa, 2008; Murao et al., 2009). Other examples of multi-stakeholder route bus installations and public transportation use-promotion schemes have increased all over the country (Akiyama et al., 2009; Matsubara, 2010; Matsumura & Matsuura, 2010; Morikuri, 2007).

The above research has focused on the particular organizations involved in bus operations and management, but as yet there has been no focus on the planning process all the way from routing and scheduling through actual operations. As such, this paper consider the case study of the R'EX bus, a completely new service realized through the cooperation of academic, private, and government stakeholders.

We will clarify the significance of the various roles played by the cooperating stakeholders of the expert project team, and its activities as part of the R'EX project in transport reform policy, ridership-improvement public relations, passenger intention and opinion surveys, route/schedule planning, vehicle and stop design, and more.

OVERVIEW OF THE R'EX

The Rakunan Express (R'EX) connects Kyoto Station's Hachijo Exit with Kyoto Pulse Plaza/Kyocera Mae (a distance of 4.6km) in about 15 minutes, then continues south for 23 minutes to Aburanokoji Otesuji (7.4km from the origin) (Fig. 1). Mainly to cater to commuters it runs in mornings and evenings every 15 minutes and during the daytime every 20 minutes, and does not run on weekends and holidays[*2]. Fare is 300 yen, differing from the existing Kyoto bus system price of 220 yen. A discounted multi-ticket booklet is available, and children's fares are set at 100 yen.

The southern Kyoto region has developed as an area for the headquarters of large companies, but because public transportation convenience has not developed in step with the road system the area has adopted a low-density, auto-centric land use pattern. To realize a leading public transit system, it is necessary to convert to a compact urban structure, and

so the aim of the R'EX experiment is to offer convenient and thus attractive public transit service by increasing user-friendliness.

In accordance with Road Transportation Act Article 21, permission was received for a one year social experiment, and bus operations for the experiment were begun on October 15, 2010. The Unit acted as the total manager and commissioned KLOOK.Co.,Ltd. as an operator. The Unit took charge of the determination of the bus route, the diagram and financial schemes.

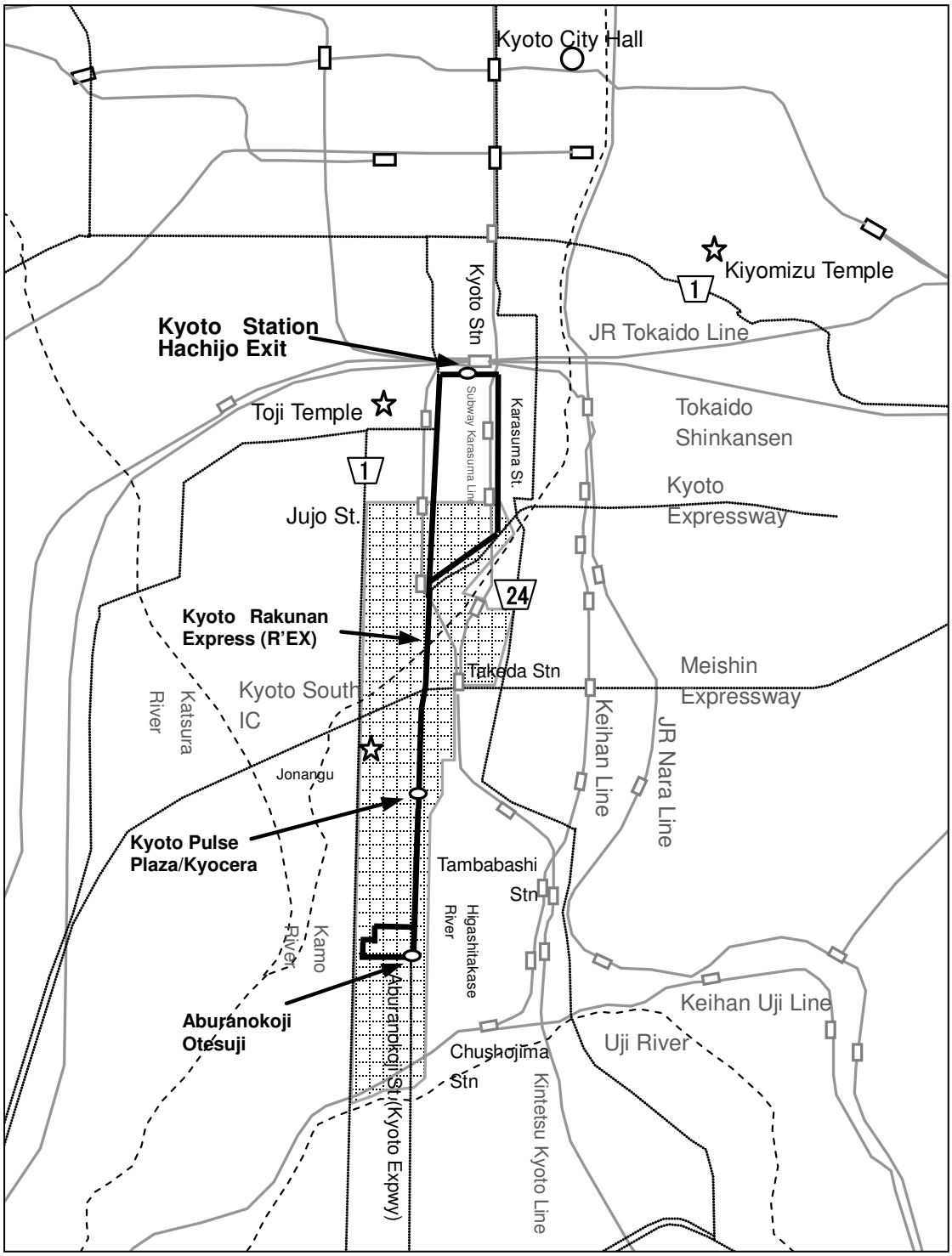

Figure 1 – The R'EX Route Map in Rakunan Shinto

Until this point, KLOOK had operated exclusively as a charter bus service. In Japan, charter buses and public buses operate under separate licenses, and so for a charter bus to operate as a public bus, it is necessary to satisfy the conditions under the more strict public bus regulations. As such, the goal was made for KLOOK to satisfy all operating license for Road Transportation Act Article 4 requirements at the end of the year-long term of the experiment.

DETAILS FOR THE R'EX OPERATION SCHEME AND EXPERIMENT

Experiment for a new bus system in the Rakunan Shinto

As an organization for tackling the regional problem in the Rakunan Shinto, the Kyoto City Planning Office for Promoting Urban Development was designated a clerical role. With participation from organizations and companies with offices in the Rakunan Shinto as well as the Kyoto Chamber of Commerce and Industry and the Kyoto Association of Corporate Executives, the "Rakunan Shinto Facilities Promotion Council" (known here as the Rakunan Promotion Council)[*3] was established. Its purpose has been for urban development activities such as improvement of the commuting environment, oversight of road facilities, business attraction, and information-gathering in the area (Rakunan Shinto Facilities Promotion Council Homepage).

In 2007 an experiment was undertaken to address the commuting issue in the Rakunan Shinto. Until then each company operated separate shuttle buses, and though in the experiment the buses operated under a joint schedule, real-world results have not been achieved. Especially for areas with many commuters such as Kyoto Pulse Plaza/Kyocera Mae, the choice between walking from the 1.5km-distant Takeda rail station, waiting for the inconvenient bus, or taking a taxi has proven problematic. There was consideration for a subway extension, but it went unrealized. In May of 2009 the "Rakunan Shinto Urban Development Promotion Program" known here as the Rakunan Promotion Program (Kyoto City Planning Office for Promoting Urban Development, 2009) planned a BRT (Bus Rapid Transit) connecting Kyoto Station with the Rakunan Shinto as part of a highly-convenient transit system. In 2009 the Ministry of Land, Infrastructure, Transport and Tourism's public transportation revitalization program was put into effect for commuter-oriented mobility management and the feasibility of a new bus system was investigated. As a part of its policy-support activity, the Unit moved toward realization of a bus connecting Kyoto Station and the Rakunan Shinto.

The R'EX Operation Scheme

At the time of actual operations for the new bus system, it was important to design a symbol for the area. Design company GK Kyoto Inc. was commissioned for total design of buses, bus stops and public relations. The Unit, operating company, and design company cooperated to draw up the operation scheme. At the phase where the bus route, schedule, equipment, stops, fare, etc. were settled, the "Council for Commuter Bus Cultivation in

Highly-integrated Business Zone" (known as the Bus Cultivation Council) was established for related parties to exchange opinions. Leveraging the Rakunan Promotion Council's outline, the Kyoto City Planning Office for Promoting Urban Development was designated a clerical role, and along with participation from area businesses, cooperation was garnered from the Kyoto City Transport and Pedestrian Policy Office and the Kinki District Transport Bureau MLIT.

Additionally, the Rakunan Promotion Council issued a survey for companies near the bus line, drawn up at the time of the Rakunan Promotion Program, and the Regional Futures Research Center participated as an advisor on demand forecasting and ridership facilitation. The Regional Futures Research Center also assisted in providing event information and public relations for ridership facilitation at Kyoto Pulse Plaza. As detailed in Fig. 2, thereafter the Bus Cultivation Council took charge as the project team for understanding ridership needs and information provision, coordination with related parties, as well as operations planning and implementation. Examination and promotional activities related to operations were carried out as detailed in Table 1.

The R'EX Cultivation Strategy

Route

The bus route adheres to the basic concept of a bus running on the symbol road of the Rakunan Shinto, Aburanokoji Street. The aim was mainly to meet commuter demand and to

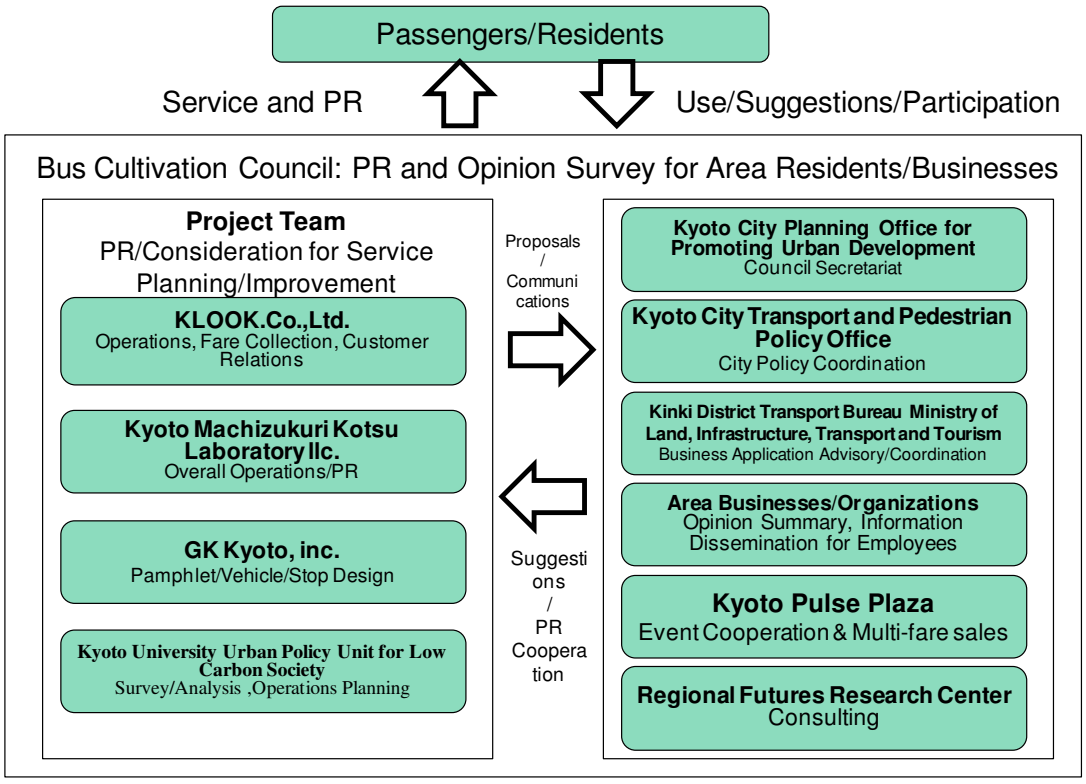

Figure 2 – The R'EX Management System and Roles

Table 1 – The R'EX Operations Chronology and Usage-promotion Activities

Year/Month/Date	Item ◎Operations ※Council ▽PR	Remarks
2009		
May	Rakunan Shinto Urban Development Promotion Program initiated	
September 9-16	Rakunan Shinto business survey by Kyoto University	15 companies, 1662 respondents
November 1	Kyoto University Urban Policy Unit for Low Carbon Society established	
2010		
January	"Walking City Kyoto" chartered/General transportation strategy initiated	
March	"Consideration of a strategy for cultivating a new route bus in the highly-integrated business area survey" report	Ministry of Land, Infrastructure, Transport and Tourism's transport revitalization program & MM (13 companies, 1370 distributed, 61% return ratio)
June 23	※Project Team established	Draft preparation toward cultivation meeting
July 6	※Cultivation meeting #1	Drafting looking toward actual operations
August 25	※Cultivation meeting #2	Report on actual operations outline, Survey cooperation request
September 15-30	※R'EX usage intention survey	4 Companies in Pulse Plaza area, 448 respondents
October 1	▽Press Report (Kyoto University, Kyoto City)	
October 6	▽Pamphlet distribution	Business: 1000, Residents: 500
October 13	◎Multi-fare booklet sales start	at Kyoto Pulse Plaza administrative offices
October 15	◎Operations start (Opening Ceremony)	
November 26	▽R'EX News vol.1 released	First-month operations report (Necessary timing, crowding)
December 3	▽R'EX News vol.2 released	Information on special schedule for New Year's (Holiday)
December 15-28	◎R'EX Christmas livery bus service	Kyocera illumination from 11/26 to 12/31
December 13	※Cultivation meeting #3	Report on service status, consideration for usage-promotion
2011		
January 4	▽R'EX News vol. 3 released	Information on extension of multi-fare booklet expiration period (March-September)
January 4-15	◎R'EX New Year's livery bus service	
January 7-25	※Akaike area resident survey	about 450 residences, 13.6% return rate
January 17	◎Start bus location information system ▽R'EX News vol.4 released	Information regarding the new bus location system
February 15-March 12	※Aburakoji Otesuji area resident survey	about 280 residences, 36.4% return rate
March 9	▽R'EX News vol.5 released	Information regarding service increase for 7:27AM departures at Kyoto Station
March 10	◎Start bus wi-fi system ▽R'EX News vol.6 released	Information regarding bus wi-fi and service improvements, reports on idea-exchange meetings
March 14	◎Service schedule adjustment	Increase 7:27AM service departures at Kyoto Station Hachijo exit
March 22	▽R'EX News vol.7 released	Information regarding continuing operations in the new fiscal year
March 30	※Cultivation meeting #4	Report on future usage-promotion and service extension
April 26	▽R'EX News vol.8 released	Information regarding Golden Week (Holiday)special schedule
July 4	▽R'EX News vol.9 released	Information regarding R'EX southern expansion
July 8	▽R'EX News vol.10 released	Report on official ridership breaking 100,000 mark
July 15	◎Service schedule adjustment	Begin service on southern extension to Aburakoji Otesuji
July 28	▽R'EX News vol.11 released	Information regarding special schedule for Kyocera Festival
August 10	▽R'EX News vol.12 released	Information on planned operations during Obon (Holiday)
September 6	▽R'EX News vol.13 released	Preliminary announcement for Weekend/Holiday service and morning service increases
October 5	▽R'EX News vol.14 released	Detailed information regarding schedule adjustments
October 11	◎Service schedule adjustment/migrate to fully-realized service	Start weekend/holiday service, 1 vehicle morning increase Approval application for Jonangu Mae bus stop Weekday service via Aburanokoji Jyonangu

firmly establish the bus by inspiring local resident use. As such the first operations route was set from Kyoto Station's Hachijo exit to Kyoto Pulse Plaza/Kyocera Mae. Used as a trade fair site, the Kyoto Pulse Plaza area lies at the center of the Rakunan Shinto and serves as the base for Kyocera's main office, as well as for Wacoal and other large companies and venture companies.According to a survey carried out before the examination, 75% of commuters to the Rakunan Shinto area passed through or transferred at Kyoto Station to get to the 1.5km-distant Takeda station. From there they walked, bicycled, used city bus or company shuttle service, or rode a taxi, none of which could be considered convenient methods of commuting. Over 16% of respondents commuted from home to work by car. Of those surveyed, 63% answered that they would use a direct bus if it were available. With the expectation that a reasonable level of passengers could be captured by direct service, the actual operations interval was set.

With the participation in the Bus Cultivation Council by the Kinki Transportation Division and coordination by Kyoto City, use of the user-friendly station-side bus terminal at Kyoto Station's Hachijo exit was possible.

Figure 3 –The R'EX at Kyoto Pulse Plaza/Kyocera Mae

Buses

It is necessary to lower operations costs to meet the demand that is necessary to support the introduction and maintenance of a new connecting bus system which can be viable in the future. As such, used vehicles were used but refurbished both in the interior and exterior with a unified monotone scheme so as present a calming atmosphere and retain ridership.

The Bus Cultivation Council considered a plan for high-capacity seating buses, as well as a plan to run on the expressway above Aburanokoji street in order to maintain timely service. However, high-capacity buses do not conform to barrier-free design requirements, and expressway regulations for buses require every passenger to wear a seatbelt. The ideas were abandoned, as the above mentioned limitations were considered inappropriate for commuter service, where there may be more passengers than seats.

Operations

Bus service is limited to weekdays in order to primarily serve commuters. When the service schedule had been decided to a certain degree, four companies in the Kyoto Pulse Plaza area were surveyed regarding intent of use and use timing. Out of 448 respondents, users who would use the bus from the start were 92 for the morning and 106 for evening service. Respondents who preferred to wait and see numbered 237 for morning service and 254 for evening service. It was determined that service concentrating around 7:30AM wouldn't

overrun vehicle capacity, and that ridership would be sufficient to meet operating demands for the day (target 600 people per day). Passenger responses were also consulted to arrange the service time table in order to properly correspond with rail arrivals.
Points arranged by the Bus Cultivation Council were (1) separation of boarding/alighting at Kyoto Station Hachijo exit, (2) off-hours stop permission at the Kyoto Pulse Plaza parking facility and insurance of timeliness and safety, (3) notification of the city taxi association via Kyoto City and Kinki Transportation Division regarding use of taxi stands during service breaks.

Stops and Logo

As detailed in Fig. 4, logo and bus stops were designed by the same company (GK Kyoto) as designed vehicle livery, as follows: (1) taking visibility into consideration, a calm blue-green monotone was chosen for easy visibility. (2) According to the background colors of vehicles, bus stops, flyers, and so on, three logo types were prepared. (3) "R'EX" was derived from Rakunan, Rapid, Relax, Renovation, and EXpress. (4) Special information space was reserved at stops for destination, stop name, time table, and route map (after beginning service this space was used for information on special service days, bus status, etc.). (5) As a landmark of the Rakunan Shinto receiving many visitors from Kyoto Station, the Kyocera headquarters building hosted the Kyoto Pulse Plaza/Kyocera Mae bus stop. These five ideas were well-received by the Bus Cultivation Council.

Figure 4 – The R'EX Logo and Bus Stop

Fare and Multi-Fare

At 300 yen for adults and 100 yen for children, the R'EX fare differs from Kyoto City and Keihan buses which operate in the area at 220 yen. The Bus Cultivation Council coordinated the following matters: (1) As a direct express service from Kyoto Station, the R'EX should be cheaper than the combination of subway and bus. (2) Multi-fare booklets shall be used, to be sold at the Kyoto Pulse Plaza administrative offices and at the Kyocera cafeteria. (3) The R'EX would be an officially-approved means of commutation for Kyocera employees. (4) A half-price discount was considered for children during special events, but at the behest of the Kinki Transportation Division fare was set at 100 yen so as not to require providing change in 10 yen increments.

Public Relations

At the time of service commencement an opening ceremony was held with Bus Cultivation Council members and area stakeholders, and was covered by newspaper and television media. Additionally, the following public relations efforts were undertaken by the Bus Cultivation Council: (1) GK Kyoto designed and printed 1000 informational flyers, which the city of Kyoto delivered to area companies to be distributed internally. (2) Kyoto City provided the Rakunan area neighborhood council with 500 flyers to be circulated door-to-door to residents. (3) Informational pamphlets were produced in the Fushimi ward newspaper and at the Fushimi Tourism Council. (4) The bus operator placed advertisements around bus stops and as flyers in newspapers, as well as making sales visits to area businesses. (5) As a direct route from Kyoto Station, the R'EX was mentioned in the transport access pages of both the Kyoto Pulse Plaza and Kyocera webpages in order to reach company visitors and event participants. (6) the R'EX activities were introduced not only in the affected region but also through Kyoto City, Kyoto University, the Ministry of Land, Infrastructure, Transport and Tourism's mail magazine, and so on. The above outline the continuing promotional activities being undertaken for the project.

Areas for Improvement

In turning toward service commencement the Bus Cultivation Council planned for improvements, though commuter behavior is not a thing that can be immediately changed. Since service inception the project has taken user needs into account and carried out service improvements as follows: (1) Because of earlier survey results indicating that late buses were common, the project promoted its trustworthiness as a system since 98% of buses completed their run within 20 minutes. (2) Similarly, the New Year holiday special schedule and news on current passenger requests were published in the R'EX newsletter (up to Vol. 14 as of October, 2011). (3) As a strategy for tackling concerns over delays, a bus-tracking system was introduced which enables passengers to confirm the current location of buses via internet-enabled PC or cell phone. (4) In order to further take root in the area, in conjunction with the yearly illumination event at Kyocera in December, bus interior and exteriors are outfitted with Christmas and New Year's decorations. (5) As a result of the idea-exchange with Kyocera (with the most passengers) (Fig. 5), bus interior temperature control was improved, bus arrival time at Kyoto Station was made earlier, and bus wi-fi was installed. (6) Arrangements have been made for idea-exchange with bus drivers so as to raise driver awareness of the project. (7) In response to Japan Railways (JR) schedule adjustments, the frequency of departures from Kyoto Station at 7:27AM was increased as of 2011/03/14 to make up for boarding congestion and improve transfers.[*4]

Issues discussed at the Bus Cultivation Council include (1) improvements in bus stop shelters and benches which reflect the characteristics of area company technologies, (2) bicycle parking at bus stops, (3) route extension south of Kyoto Pulse Plaza, (4) weekend and holiday service during special events at Kyoto Pulse Plaza, (5) and provisions for transfer information to further fulfill passenger services.

Regarding (3) route extension, the service would be an especially efficient one for area residents traveling to Kyoto Station. For this purpose and to determine the feasibility of an extension in the western (Akaike National Road) and southern (Aburanokoji Otesuji) areas, a passenger survey was conducted via Kyoto City at two apartment complexes. The return rate from the Akaike area survey was low at 13.6% of about 450 households, where only 21 respondents reported that they would use the service to commute to Kyoto Station. In the Aburanokoji area the response rate was high at 36.4% of 280 households, but only 14 respondents indicated that they would commute to Kyoto Station using the service. These results do not indicate a clear need for route extension. However, automobile use in this area has been dominant for some time. In consultation with businesses located in the southern section of the Rakunan Shinto, it was determined that there was latent demand for transportation service that could be unearthed. On July 15, 2011 service was extended to Aburanokoji Otesuji.

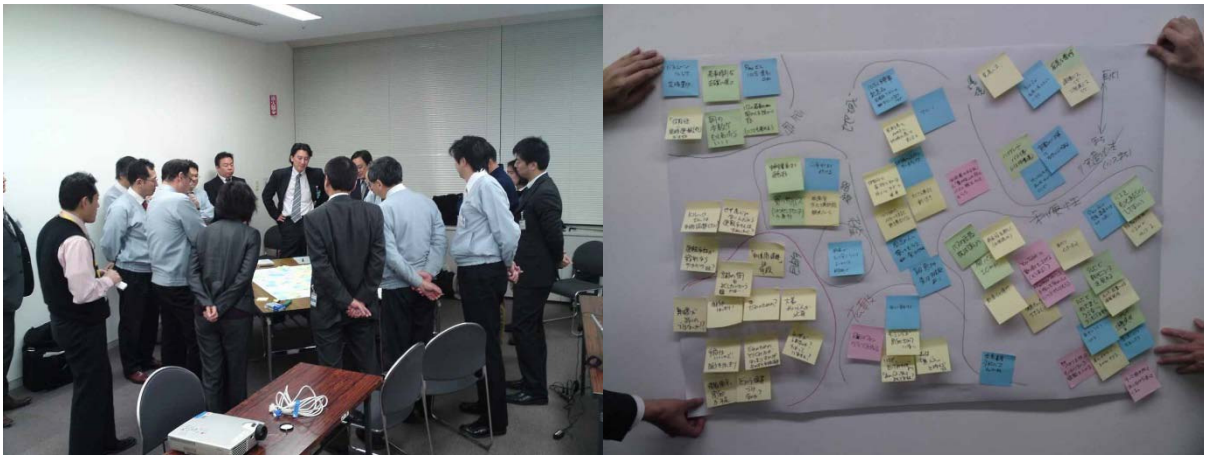

Figure 5 – Idea Exchange Meeting at Kyocera

SIGNIFICANCE OF COOPERATING WITH VARIOUS STAKEHOLDERS

Project Team Roles

Focus until this point has been on planning to operations phases of the R'EX project and the various stakeholders taking part in the process. This scheme is in current operation and continues to improve and move forward. Hereafter the various roles being performed as part of the process will be considered. Dividing these roles into major categories, they can be broken into the project team, Bus Cultivation Council, and finally the passengers.
As system manager, the project team is responsible for planning, decision-making, execution, and public relations for passenger service.

The Unit takes responsibility as a policy think tank for arranging surveys, service planning, information systems, and generally for the project as a whole. At full-scale operations responsibility will be split between the Kyoto Machizukuri Kotsu Laboratory and the Unit.
The design company takes charge for the design of system logo and vehicles, bus stops, and flyers, etc.. These serve as the face of the bus service for passengers, and are indispensable in expressing the improved ease, comfort, and dependability offered by the system.
The operator is responsible for vehicles, driver arrangements, bus service, fare collection, customer relations, public relations, bus status information system operations, applications processes and so on.
Established bus operators must independently handle all administrative matters. Even at large companies, employees who can take charge of operations plans and management strategies are decreasing, and so service improvements are difficult. On the other hand, with this project the new operator had no previous public bus experience and so was amenable to accepting guidance from the University and design company, with the end result that efficient operations and service could be introduced.

Roles of the Bus Cultivation Council

The following outlines the idea-exchange about bus management and stakeholder-relations conventions carried out at Bus Cultivation Council.
Kyoto City (a) arranges meetings with conference administrators, (b) cooperates on survey administration, (c) coordinates between the Kyoto City Transportation Bureau, the Civil Engineering Office, Public Safety Commission, and regional public transportation operators, (d) carries out communications via the Rakunan Promotion Council mailing list, as well as with private companies, (e) distributes information to and circulates among area residents via the neighborhood council, (f) provides information through the R'EX news, Rakunan Promotion Council bulletins, ward newspapers, etc.
Participating companies (a) impart information to employees via morning assemblies, departmental memos, email lists, announcements, lobby and cafeteria bulletins, etc., (b) carry out idea-exchange at the conference using employee suggestions, (c) provide the R'EX information on company websites and public relations materials, (d) sell the R'EX multi-fare booklets at the company cafeteria (Kyocera).
Kyoto Pulse Plaza (a) as a trade fair site cooperates to provide the R'EX with event information, especially for weekday events which result in ridership surges, (b) cooperates on public relations activities by providing flyers and posters in meeting spaces and administrative offices, (c) provides the R'EX information on its home page and promotional materials (d) sells multi-fare booklets at its administrative offices, (e) provides parking space for bus driver switching and emergencies, as well as restrooms for drivers.
The Regional Futures Research Center takes charge as the business development consultant for planning the Rakunan Promotion Program in the Rakunan Promotion Council. It runs surveys at area companies, creates bulletins for the Rakunan Promotion Council, and serves as a demand-forecasting and use-promotion advisor for the Bus Cultivation Council.

The Kinki District Transport Bureau advises regarding specifications of bus vehicle, installation of a bus stop, legal procedures for new operations and other regulations, and other organizational issues.

Because of the features of the Bus Cultivation Council as mentioned above, the following advantages can be assumed: (1) Bus operations and processes for system improvements, which might normally be an obstacle for newly-formed companies, can progress smoothly. (2) Without businesses using shuttle buses, convenience for employees and visitors increases. (3) Operations-related information and improvement activities can be efficiently communicated to passengers, and passenger needs are easily understood.

Participation of Various Entities, Including Passenger

Service improvements take place not only due to the Bus Cultivation Council but also thanks to the cooperation of passengers. Through earlier usage surveys, passengers express their needs and impressions of the service.

It is important to get opinions not only from users but also from those who expect to use and those who will not use the service. Additionally, passengers participate in idea-exchange meetings and at project team workshops. Proposals were raised from the viewpoints not only of current problems but also of future public transportation development in the Rakunan Shinto area. Bus wi-fi installation and other features were realized according to this process, along with improved arrival timing and other details needed for quick improvement. The greatest advantage of cultivating public transportation is this two-way communication process, as well as transparent management.

Daily ridership in the first month after beginning service in October averaged about 300. In response to the notion that buses were often late, 98% on-time service data was demonstrated, earning passenger trust in the system. Furthermore, customer needs were considered, and due to service improvements and promotion measures ridership continued to increase every month. In mid-March of 2011, in response to worries about the continuation of service from April, an explanation about the continuation of the R'EX project was run in the R'EX news. In April at the start of the fiscal year, the aim of 600 passengers per day had been achieved (Fig. 6). Furthermore, in July of 2011 after the southern extension, daily ridership had expanded to 800. This ridership exceeds the 689 potential passengers who had responded in surveys prior to the project that they would like to use the service or wait and see.

The R'EX project is managed by various participants, though it differs from other bus management groups. Consultation and decision-making regarding bus service takes place at Bus Cultivation Council, with the administration, the operator, local residents, and experts participating in administrative and residential initiatives. The function of the Bus Cultivation Council is to cultivate the bus system, and consultation on ridership attraction and service improvement is judged and decided by the project team. However, the more varied parties participate in decisions on route choice, stop placement, service schedule, fare, etc., the more difficult decisions are to make, and the more opinions and suggestions are accounted for the less useful the service will become. In other words, cases of cheap fare services serving many areas may be found, but they take too long to reach their destinations and

ridership is low, profit decreases. It is certainly a positive thing to receive many varying opinions, but it is difficult to offer quality service with a decision-making process which majority vote too strongly reflects strongly-pushed opinions. There is a high possibility of meeting the most users' needs by deciding on generalized, efficient, intensive service, through expert analysis of system needs via hearings and surveys considering local regulations. However, it is essential to clearly explain the basis for why this sort of service is offered, and to verify that actual service meets user needs and that the improvement structure is in order.

Figure 6 – Ridership Increase Note: Average Monthly Ridership, Starting on 10/15

CONCLUSION

This paper showed the significance of actions promoted by the expert project team in connecting Kyoto Station with the Rakunan Shinto (Highly-integrated zone) via direct bus as the Rakunan Express (R'EX) project.

- Transport policy experts and design experts united the project team to carry out passenger intention surveys, planning and management of high-quality service.
- The Kyoto University Urban Policy Unit for Low Carbon Society acted as the total manager, taking charge of the determination of the bus route, the timetable, and financial schemes.
- Making up the Bus Cultivation Council, various organizations are arranged to perform the following roles in service improvements and public relations with area workers and residents. As the general organizer, the regional government takes the role of the

administrative office. The Kinki District Transport Bureau MLIT advises legal procedures for new operations. Area businesses cooperate in distributing passenger opinion surveys and guidance information to employees.

- The project has introduced a system for communicating improvements made as a result of idea-exchanges at workshops and suggestions from passenger.
- Keeping in mind previously unprofitable schemes (private/public transit), the project first ran service as an experiment concentrating on weekdays in areas with comparatively greater need in order to limit risks. With growing ridership, phased growth in terms of line extensions and weekend/holiday service could be realized.
- The project is the first step toward compact urban form, attracting passengers and perhaps more importantly business by initiating a public transportation hub area where previously public transportation was inconvenient.

In this way various stakeholders participated to realize full operations from planning stages through service introduction. Furthermore, after service implementation continuous improvements were necessary, and the framework introduced here has been an effective method for providing highly-convenient public transportation, along with promoting area development around bus stops and stations in the future.

*1: The Kyoto Machizukuri Kotsu Laboratory llc., created in 2007, is a collaborative effort between the University and city-center businesses for transport-use promotion.
*2: Weekend/Holiday service between Kyoto Station and Kyoto Pulse Plaza/Kyocera Mae began on October 11, 2011. In keeping with this, daytime/weekend/holiday discount multi-fare booklets are sold. Furthermore, new route service stopping at the “Jonangu Mae” stop near the Jonangu Shrine was added on February 18, 2012.
*3: After beginning weekend/holiday service on February 9, 2012, “commuter” was removed from the council’s title and converted to “Rakunan Shinto Kyoto Station Direct Bus Route Cultivation Council.”
*4: As of October 11, 2011, vehicles in real service numbered 6 buses. As such, departures from Kyoto Station Hachijo exit at 7:42AM were increased.

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