

# APPLICATION FORM

## Japan-France Integrated Action Program (SAKURA) Joint Project Proposal

### A. Application Form

<b>A1</b>	<b>Title of Proposed Project</b>
	<b>Analysis on Changes in Household Car Ownership and Use</b>

<b>A2</b>	<b>Main Subject Area</b>	
	1 <input type="checkbox"/> Mathematics, information technology and applications 2 <input type="checkbox"/> Information and communication sciences and technology 3 <input type="checkbox"/> Physics 4 <input type="checkbox"/> Engineering Sciences 5 <input type="checkbox"/> Space, aeronautics 6 <input type="checkbox"/> Chemistry	7 <input type="checkbox"/> Earth Sciences, astronomy 8 <input checked="" type="checkbox"/> Energy, transports, environment 9 <input type="checkbox"/> Biology, medicine, health 10 <input type="checkbox"/> Agronomy, animal production, vegetal and food 11 <input type="checkbox"/> Human and Social Sciences 12 <input type="checkbox"/> Law, Politics, economy and management

<b>A3</b>	<b>Applicant Information</b>			
	<b>Japan</b>		<b>France</b>	
	Organization	<b>Nagoya University</b>	Organization	<b>The French National Institute for Transport and Safety Research (INRETS)</b>
	Name of the Project Leader	<b>Toshiyuki Yamamoto</b>	Name of the Project Leader	<b>Jean-Loup MADRE</b>
	Address	<b>Furo-cho, Chikusa-ku, Nagoya-shi, Aichi 464-8603</b>	Address	<b>2, Avenue de Général Malleret-Joinville, F-94114 ARCUEIL CEDEX</b>
	Tel/Fax	<b>81 52 789 4636 / 81 52 789 3738</b>	Tel/Fax	<b>33 1 4740 7269/ 33 1 4547 5606</b>
	E-mail	<b>yamamoto@civil.nagoya-u.ac.jp</b>	E-mail	<b>madre@inrets.fr</b>

<b>A4</b>	<b>Other Collaborating Participants and Organizations</b>	
	<b>Japan</b> Ryuichi Kitamura, Kyoto University Akimasa Fujiwara, Hiroshima University Junyi Zhang, Hiroshima University Kuniaki Sasaki, Yamanashi University	<b>France</b> Anne Aguiléra, INRETS Akli Berri, INRETS Roger Collet, INRETS & Université Paris 1 Laurent Hivert, INRETS

<b>A5</b>	<b>Project Period</b>					
	from	10	2003	to	9	2005
		(month)	(year)		(month)	(year)

<b>A6</b>	<b>Budget Request</b>			
	<b>Japan</b>		<b>France</b>	
	1 <sup>st</sup> year	¥ 1,000,000	1 <sup>st</sup> year	€ 7,500
	2 <sup>nd</sup> year	¥ 1,000,000	2 <sup>nd</sup> year	€ 7,500
	total	¥ 2,000,000	total	€ 15,000

#### DECLARATION BY THE PROJECT LEADERS OF THE COLLABORATING ORGANIZATIONS

All necessary infrastructure facilities will be provided by the Project Leader (PL) of the Project.

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(Signature of Japanese/French PL)

B. Project Details (see Guidelines of Sakura)

**B1. Project Abstract**

Although car ownership is increasing on aggregate in all countries, the net changes mask a substantial variability at the individual household level. At the individual household level, car ownership and car use may increase or decline. Changes in car ownership and use are determined by economic factors, e.g., income and costs, and also by various changes in household circumstances or transitions: changes of residential location or the place of work; the entry into and the exit from the labor force; and transitions in the structure of the household (arrival or departure of a member, or a member becoming of driving age). Of specific interest in this research work package is to examine reductions in car ownership and car use at the household level and to determine the extent to which the reductions could be explained in terms of these transitions.

The study compares France, Japan, and possibly the U.S.A., all of which have major auto industries and high levels of car ownership. The comparative study is carried out with both repeated cross-sectional and panel data from these countries. The former can provide long term trends in car ownership and use, while the latter enables to explore the volatility in changes and to analyze the factors behind them. The study will offer better understanding of household car ownership and use by comprehensive investigations with latest statistical methods. Also, the study will be extended to explore car cultures in Europe, Japan and U.S.A. It will analyze the conditions under which travel behavior could change from car dependence to a more sustainable mobility.

**B2. Project Description**

- objectives, background, project plan including an itemized work plan showing individual tasks and responsible organizations
- statement describing the importance of proposed project

Two analyses described below offer insights into long-term trends in household car ownership and use over 30 years in Japan, and over a comparable span of time in France. It is mainly focused on large metropolitan areas (Paris, Kyoto-Osaka-Kobe, Nagoya, Hiroshima, California) and on demographic (ageing of the population, generation effects, etc.) and geographic (land use, urban sprawl, etc.) trends. The insights from the long-term, large-scale cross-section data provide the starting point for the more detailed analyses with individual household panel data.

- French project team analyzes the Global Transport Survey data set conducted in the Paris region (1977, 1984, 1992, 1998 and 2002), which is a large-scale repeated cross-section data set, and examines longitudinal trends of car ownership and use in Ile-de-France.
- Toshiyuki Yamamoto analyzes the Chukyo-area (including his base, Nagoya) Person Trip Survey data, and Ryuichi Kitamura the Kyoto-Osaka-Kobe area (including his base, Kyoto) Person Trip Survey data, both of which have large sample sizes, and cover a period spanning 30 years (1970, 1980, 1990 and 2000) that includes the period when car ownership increased most rapidly in Japan.

Panel analyses, exploiting observations of individual households over time, are considered to have superior possibilities of giving more rigorous accounts of car ownership and use, but few panel survey data are available for the analyses on car ownership. Four analyses described below offer detailed insights on car ownership and use with exceptional working panel data.

- French project team analyzes INSEE Household Conjuncture Survey (1972-94) and SOFRES-INRETS-ADEME Parc Auto Survey data, which have a large sample size, and cover the whole period under review
- Akimasa Fujiwara and Junyi Zhang from Hiroshima University analyze a small-size transportation panel survey data of five waves held in Hiroshima with a sample size of about 1,000.
- Kuniaki Sasaki from Yamanashi University analyzes a small-size shopping panel survey data of eight waves held in Kofu, Yamanashi with a sample size of about 500.
- Toshiyuki Yamamoto and Ryuichi Kitamura analyze a panel survey data of car ownership held in California, U.S.A., with three waves and a sample size of about 5,000 households.

### **B3. Project Schedule and Milestones**

#### Key Milestones

- Analyses on large-scale cross-section data both in France and Japan are carried out in the first year, and completed by August, 2004.
- A seminar is held in Japan in September, 2004, on topics including presentation of the results so far, discussion, and development of research agendas for the second year.
- Analyses on panel survey data from France, Japan, and U.S.A. are carried out in the second year soon after the seminar, and completed by August, 2005.
- A symposium/seminar is held at INRETS, France, in September, 2005, inviting researchers outside of the research project as well as the project team members. It could be a joint meeting with the corresponding workshop of the European COST Action we have proposed. The research results are presented and followed by discussions on the results, future research collaboration, and prospective future fund sources.

#### Exchanges of Researchers

Name	Duration	Date of Arrival	Date of Departure
Jean-Loup Madre	5 days	September 8, 2004	September 12, 2004
Anne Aguiléra	5 days	September 8, 2004	September 12, 2004
Akli Berri	5 days	September 8, 2004	September 12, 2004
Roger Collet	5 days	September 8, 2004	September 12, 2004
Laurent Hivert	5 days	September 8, 2004	September 12, 2004
Toshiyuki Yamamoto	5 days	September 7, 2005	September 11, 2005
Ryuichi Kitamura	5 days	September 7, 2005	September 11, 2005
Akimasa Fujiwara	5 days	September 7, 2005	September 11, 2005
Junyi Zhang	5 days	September 7, 2005	September 11, 2005
Kuniaki Sasaki	5 days	September 7, 2005	September 11, 2005

### **B4. Collaboration**

- description of the collaborative arrangements between participating organizations defining general responsibilities and tasks assigned to each participating organization
- Japanese Project Leader, Toshiyuki Yamamoto, works as the distributor of the information among research participants. He visits each Japanese participant at the beginning of the research project if needed, and keeps them all informed throughout the project.
- The seminar in September, 2004, and symposium/seminar in September, 2005, facilitate face-to-face communication among project participants, and enhance collaboration between French and Japanese project teams.

## **B5. Biographical sketches (CV) of the Project Leaders and other key project personnel**

- Use separate sheet for Japanese team and French team
- Include name, date of birth, academic degree (title, year obtained, organization obtained), field of specialization, and main latest scientific publication (to a maximum of five)

### **Japan**

**Toshiyuki Yamamoto, 1969/06/18, Dr.Eng.(2000, Kyoto University), transportation planning**

- Yamamoto, T., Kitamura, R. and Fujii, J. (2002) Driver's route choice behavior: analysis by data mining algorithms, *Transportation Research Record*, No. 1807, pp. 59-66.
- Yamamoto, T., Kitamura, R. and Kishizawa, K. (2001) Sampling alternatives from a colossal choice set: an application of the MCMC algorithm, *Transportation Research Record*, No. 1752, pp. 53-61.
- Yamamoto, T., Fujii, S., Kitamura, R. and Yoshida, H. (2000) An analysis of time allocation, departure time and route choice behaviour under congestion pricing, *Transportation Research Record*, No. 1725, pp. 95-101.
- Yamamoto, T. and Kitamura, R. (2000) An Analysis of household vehicle holding durations considering intended holding durations, *Transportation Research A*, Vol. 34A, No. 5, pp. 339-351.
- Yamamoto, T. and Kitamura, R. (1999) An analysis of time allocation to in-home and out-of-home discretionary activities across working days and non-working days, *Transportation*, Vol. 26, pp. 211-230.

**Ryuichi Kitamura, 1949/04/03, Ph.D. (1978, University of California, Davis), transportation planning**

- Kitamura, R., Yamamoto, T. and Fujii, S. (2003) The effectiveness of panels in detecting changes in discrete behavior, *Transportation Research Part B*, Vol. 37, No. 2, pp. 191-206.
- Kitamura, R., Yamamoto, T. and Sakai, H. (2003) A methodology for weighting data from complex endogenous sampling, *Transportation Research Part B*, Vol. 37, No. 4, pp. 387-401.
- Kitamura, R., Akiyama, T., Yamamoto, T. and Golob, T.F. (2001) Accessibility in a metropolis: toward a better understanding of land use and travel, *Transportation Research Record*, No. 1780, pp. 64-75.
- Kitamura, R., Yamamoto, T., Kishizawa, K. and Pendyala, R.M. (2000) Stochastic frontier models of prism vertices, *Transportation Research Record*, No. 1718, pp. 18-26.
- Kitamura, R., Nakayama, S. and Yamamoto, T. (1999) Self-reinforcing motorization: can travel demand management take us out of the social trap? *Transport Policy*, Vol. 6, pp. 135-145.

**Akimasa Fujiwara, 1960/09/24, Dr.Eng. (1993, Hiroshima University), transportation planning**

- Lee B., Fujiwara A., Sugie Y. and Namgung M. (2003) A sequential method for combining random utility model and fuzzy inference model, *Journal of Advanced Computational Intelligence and Informatics* (in press).
- Sugie Y., Zhang J. and Fujiwara A. (2003) A weekend shopping activity participation model dependent on weekday shopping behavior, *Journal of Retailing and Consumer Services* (in press).
- Zhang J., Sugie Y. and Fujiwara A. (2001) A mode choice model separating taste variation and stated preference reporting bias, *Journal of the Eastern Asia Society for Transportation Studies*, Vol.4, No.3, 23-38.
- Fujiwara A., Sugie Y. and Moriyama M. (2000) Nested paired combinatorial logit model to analyse recreational touring behaviour, *Proc. of 9th International Conference on Travel Behaviour Research*, International Association for Travel Behaviour Research (IATBR) (CD-ROM).
- Fujiwara A. and Sugie Y. (1999) Prediction accuracy of dynamic SP models, *Selected Proceedings of 8th World Conference on Transport Research*, Vol.3, 25-38.

**Junyi Zhang, 1966/04/08, Dr.Eng. (1996, Hiroshima University), transportation planning**

- Zhang J., Timmerman H., Borgers A. and Wang D. (2003) Modeling traveler choice behavior using the concepts of relative utility and relative interest, *Transportation Research Part B* (in press).
- Sugie Y., Zhang J. and Fujiwara A. (2003) A weekend shopping activity participation model dependent on weekday shopping behavior, *Journal of Retailing and Consumer Services* (in press).
- Zhang J., Timmermans H. and Borgers A. (2002) A utility-maximizing model of household time use for independent, shared and allocated, activities incorporating group decision mechanisms, *Transportation Research Record*, No. 1807, 1-8.
- Zhang J., Sugie Y. and Fujiwara A. (2001) A mode choice model separating taste variation and stated preference reporting bias, *Journal of the Eastern Asia Society for Transportation Studies*, Vol.4, No.3, 23-38.
- Sugie Y., Zhang J. and Fujiwara A. (1999) Dynamic discrete choice models considering unobserved heterogeneity with mass point approach, *Journal of the Eastern Asia Society for Transportation Studies*, Vol.3, No.5, 245-260.

**Kuniaki Sasaki, 1967/09/21, Dr.Eng. (1998, Kyoto University), transportation planning**

- Nishii, K., Sasaki, K., Teramoto, R. and Yang, Q. (2002) An basic analysis and modeling of manufacturing industry sector's location preference: focusing on area attractiveness with the function decreased by distance, *Infrastructure Planning Review*, Vol. 19, pp. 165-171 (in Japanese).
- Nishii, K., Sasaki, K., Nishino, I. and Imao, T. (2002) An analysis of time use patterns of non-workdays activity and travel behaviors in metropolitan areas, *Infrastructure Planning Review*, Vol. 19, pp. 561-568 (in Japanese).
- Nishii, K., Sasaki, K. and Imao, T. (2002) Activity diary survey as a supplement of person trip survey –activity and travel pattern properties of aged people-, *Journal of Infrastructure Planning and Management*, No. 702/IV-55, pp. 31-38 (in Japanese).
- Sasaki, K. (2000) Combining attitudinal indicators and SP and RP choice data using discrete choice model and SEM model - simultaneous estimation applying latent class model - , *Proceedings of IATBR 2000 CD-ROM (Gold Coast)*.
- Sasaki, K., Morikawa, T. and Kawakami, S. (1999) A discrete choice model with taste heterogeneity using SP, RP and attribute importance ratings, *Proceedings of 8th World Conference on Transport Research*, Elsevier, Vol. 3, pp.39-49.

## **B5. Biographical sketches (CV) of the Project Leaders and other key project personnel**

- Use separate sheet for Japanese team and French team
- Include name, date of birth, academic degree (title, year obtained, organization obtained), field of specialization, and main latest scientific publication (to a maximum of five)

### **France**

Jean-Loup Madre 1950/02/10, Ph.D. (1980, Université Paris 6; 1985, Université Paris 1), mathematical statistics and economics

- Bussière Y. and Madre J.-L. (eds.) (2002) *Démographie et Transport : Villes du Nord et Villes du Sud*, L'Harmattan, Paris, 477 p.
- Armoogum J., Hivert L. and Madre J.-L. (eds.) (2001) *Longitudinal data: collection and analysis issues*, proceedings of the symposium of the research seminar "Mobility Perspectives in Metropolitan Areas", 210 pages.
- Dargay J., Madre J.-L., Berri A. (2000) Car ownership dynamics seen through the follow-up of cohorts : a comparison of France and the UK", *Transportation Research Record*, No. 1733, pp. 31-38.
- Armoogum J., Hivert L., Madre J.-L. (eds.) (2000) *Paris-Kyoto seminars: Meeting 2000 between INRETS-DEST-EEM and Department of Civil Engineering Systems, Kyoto University*, including *Decoupling harmful effects of urban traffic growth from economic growth*, proceedings of the October 2000 symposium on Mobility Perspectives in Metropolitan Areas, 181 pages.
- Berri A. and Madre J.-L. (1997) Motorization/car ownership as a descriptor of passenger demand, in *Demand Descriptors of Passenger Transport*, SCENARIOS, Deliverable No. D5.

Anne Aguiléra 1973/11/19, Ph.D. (2001, Université Lyon 2), transport economics

- Aguiléra A. (2003) Service Relationship, Market Area And The Intrametropolitan Location of Business Services, *The Service Industries Journal*, Vol. 23, No. 1, January, pp.43-58.
- Aguiléra A. and Mignot D. (2002) Structure des localisations intra-urbaines et mobilité domicile-travail, *Recherche Transport Sécurité*(forthcoming).
- Aguiléra A. and Arabeyre-Petiot A. (2001) Transport Infrastructures and Intramétropolitan Location of Business Services. The Case of The Metropolitan Area of Lyon, 9<sup>th</sup> WCTR, Seoul, 22-27 July, 15 p.
- Mignot D., Buisson M-A. and Aguiléra A. (2000) Dynamic activities and the formation of urban sub-centers : the case of the metropolitan area of Lyon, 6th World Congress of the RSAI, Lugano, 16 - 20 May, 19 p.

Akli Berri 1966/01/12, Ph.D. candidate (Université Paris 1), transport economics

- Berri A. (2002) Longitudinal Analysis of Car Ownership in Different Countries, in Michael Patriksson et Martine Labbé (eds.): *Transportation Planning - State of the Art*, coll. Applied Optimization, vol. 64, Kluwer Academic Publishers, Dordrecht, chap. 14, pp. 229-245.
- Madre J.-L. , Berri A. and Papon F. (2002) Can a decoupling of traffic and economic growth be envisaged?, in William R. Black and Peter Nijkamp (eds.), *Social Change and Sustainable Transport*, Indiana University Press, Bloomington, IN, chap. 26, pp. 209-216.
- Berri A., Gallez C. and Madre J.-L. (2001) Dynamique des dépenses de logement et de transport des ménages franciliens, in Lassave, P. et Haumont A. (eds.) *Mobilités Spatiales: une question de société*, L'Harmattan, Paris, pp. 21-33.
- Berri A. and Madre J.-L. (2001) Analyse de la motorisation des ménages dans différents pays: une approche démographique, in Aron, M., Boillot, F. et J.-P. Lebacque (eds.): *Modélisation du Trafic*, Actes INRETS, No. 78, pp. 151-171.
- Dargay J. M., Madre J.-L. and Berri A. (2000) Car Ownership Dynamics Seen Through the Follow-up of Cohorts: a Comparison of France and the UK, *Transportation Research Record*, No. 1733, pp. 31-38.

Roger Collet, 1978/11/26, Ph.D. candidate (Université Paris 1), transport economics

Laurent Hivert, 1960/12/09, Ph.D. (1989, Université Paris 6), transport economics

- Hivert L. and Papon F. (2002) Le projet «Prospective de la Mobilité Urbaine» à mi-parcours, *Recherche Transport Sécurité*, introduction to No. 77, special issue on Mobility perspectives in urban areas, 4 pages (forthcoming).
- Armoogum J., Bonnel P., Caubel D., Hivert L., Massot M.H. and Mignot D. (2002) Evaluation of car traffic reduction potential in urban areas : Paris and Lyon case-studies, communication at the European Transport Conference, Homerton College, Cambridge, UK.
- Hivert L. (2001) Le parc automobile des ménages, étude en fin d'année 1999 à partir de la source "Parc Auto" SOFRES, Rapport de Convention ADEME-INRETS, 180 pages.
- Hivert L. et J. Péan de Ponfily J. (2000) Inégalités d'accès à l'automobile, disparités d'équipement et d'usage entre les ménages les plus pauvres et les plus riches, Rapport de Convention ADEME-INRETS, 90 pages.
- Hivert L. (1999) Dieselisation and the "new dieselists" behaviour: recent developments in the French car fleet, communication at the 1999 European Energy Conference, 10 pages.

**B6. Others**

- **Background information related to the project; joint collaboration and/or other types of activities.**
- **Continuation of the collaboration** (Do you see collaboration beyond the supporting period by the Sakura program? Please indicate how. Will you be seeking funding from other sources? Please indicate how)

**Background**

There is a tradition of cooperation between our research teams:

- One of the Japanese collaborating participants, Ryuichi Kitamura, organized a research project, “development of the simulation model of household vehicle holding” with the Japanese project leader, Toshiyuki Yamamoto in 1997-98, which was funded by the Japanese Ministry of Education, Culture, Sports, Science and Technology under a Grant-in-Aid for International Scientific Research (Joint Research). In 1998, a seminar/symposium, “Paris-Kyoto Seminar/Symposium on Transportation in Historical Cities”, was held as part of the research project, and the French project leader, Jean-Loup Madre and the French collaborating participants, Akli Berri, presented their researches on car ownership, respectively.
- French project leader, Jean-Loup Madre, organized an international seminar, “Paris-Kyoto Seminars: Meeting 2000 Between INRETS-DEST-EEM and Department of Civil Engineering Systems, Kyoto University” with the French collaborating participant, Akli Berri in 2000, and Japanese project leader, Toshiyuki Yamamoto, and one of the Japanese collaborating participants, Ryuichi Kitamura, presented their research projects on car ownership and on longitudinal changes of mobility, respectively. The main topic of this seminar was “Decoupling harmful effects of urban traffic growth from economic growth”.
- Japanese project leader, Toshiyuki Yamamoto, stayed with the French project leader, Jean-Loup Madre, at his laboratory in INRETS as a visiting scholar during September and October 2000, and started a collaborative research on household car transaction with French data set.
- In November 2001, CNRS (Laboratory of Longitudinal Studies in Caen) and INRETS (Department of Economics and Sociology of Transport in Arcueil) organized a symposium on “Longitudinal data: collection and analysis issues” with presentations not only from INRETS and Kyoto University, but also from CNRS, University College London and Université Laval in Quebec.

**Continuation**

French project leader, Jean-Loup Madre, and Japanese project leader, Toshiyuki Yamamoto, together will apply for the Grant-in-Aid for Scientific Research funded by the Japanese Ministry of Education, Culture, Sports, Science and Technology for continuing this collaborative research. This project is closely connected to :

- a PREDIT project on “Car dependence in Europe” in collaboration with colleagues from University College London and the universities of Karlsruhe and Paris 1, and to
- a proposal for a COST Action on “Changing behavior for a more sustainable transport system”, networking researchers from 10 European countries (covering costs of organizing meetings).