

Measure title: Car-pooling System Stuttgart

City: Stuttgart

Project: CARAVEL

Measure number: 09.03

A Introduction

A1 Objectives

The measure objectives are:

- Promotion of the on-line car-pooling service “Pendlernetz Stuttgart”.
- Enlargement of the system with event-oriented traffic features.
- Reduction of motorized private vehicle traffic, congestion on roads, fuel consumption, emissions and transport costs.
- Promote new ecologically-compatible transport modes.
- Increase traffic efficiency and convenience.
- Improve the mobility of all citizens and visitors of the region of the capital of Stuttgart.

A2 Description

The Stuttgart car-pooling measure aims at organising car-pools from door to door, especially for commuters in the Stuttgart Region. The service, which is free of charge, is provided by *Pendlernetz Stuttgart* (<http://stuttgart.pendlernetz.de>). The service is run by the Stuttgart Mobility Centre with the aim to improve the mobility of all citizens and visitors of the city and region of Stuttgart.

Activities concentrated on the extension of the system, which has been enlarged by event-oriented traffic features to also encourage event-oriented car-pooling (e.g. soccer games, concerts etc.), the integration of intermodal information (information on public transport) and additional services like SMS/Email alert, and, finally, the integration of a regional access to the online system “Pendlernetz”.

The car-pooling service actively promotes ecologically-compatible transport modes and reduces motorized private vehicle traffic and, thus congestion on roads, consumption of fuel and emissions as well as of transport costs.

B Measure implementation

B1 Innovative aspects

Select one or more innovative aspects from the list below (see Guidance notes for further explanation), then describe each in more detail with a few sentences:

Innovative Aspects:

- **New conceptual approach**
- Use of new technology/ITS
- **New mode of transport exploited**
- **Targeting specific user groups**
- New economic instrument
- New policy instrument
- New organisational arrangements or relationships
- New physical infrastructure solutions
- Other – *please describe*

The innovative aspects of the measure are:

- **New conceptual approach (new mode of transport exploited)** – Develop alternatives to the conventional use of vehicles by means of innovative concepts such as car-pooling, integrating information management systems in order to promote intermodality and involving a high number of companies through new, organised actions regarding commuter mobility.
- **Targeting specific user groups** – Enlargement of car-pooling from commuter traffic to event traffic. With the extension of the online-car-pooling-system “Pendlernetz Stuttgart” especially commuters and visitors of big events, such as pop concerts and soccer games, have the opportunity to reach their destinations fast, cheap and in an ecologically-compatible way.

B2 Situation before CIVITAS

The system was developed within the ISCOM Project, supported by the European Commission within the IST Programme of the 5th Framework Programme and further developed and maintained within the CIVITAS-CARAVEL Project. The system “Pendlernetz Stuttgart” is one of the most innovative car-pooling systems existing so far in the EU, especially with regard to the three main features:

- communication via SMS
- geographically referenced route mapping and
- automatic data transfer to the public transport itinerary.

The event data pool was not yet invented. Event-oriented car-pooling is a completely new feature developed within CIVITAS-CARAVEL.

The main target group of the system are commuters. Daily there are about 750 000 commuters within the region of Stuttgart; 200 000 commuters enter the city of Stuttgart daily and about 50 000 commuters drive from Stuttgart into the region per day. A car is occupied with 1.26 persons on average. One of the main aims of car-pooling is to reduce the amount of private vehicle traffic and to increase the occupancy rate in private cars in the region of Stuttgart.

It can clearly be seen, that the number of vehicles registered in Stuttgart increased permanently despite the fact that the increase per year became lower for the period 2002 to 2005 compared to the years before. It is estimated that the number of vehicles will continue to increase in future. The number of vehicles in the state of Baden-Wuerttemberg also increased from less than 5 millions of vehicles in 1995 to more than 7.5 millions of vehicles in 2006.

Motorized vehicles in Stuttgart

Year	Motorized vehicles (total)	Thereof			Motorized vehicles per 1000 inhabitants
		Passenger cars	Trucks	Motorcycles	
2000	358 265	301 530	15 062	18 509	584
2001	363 973	306 658	15 095	19 162	590
2002	364 821	307 605	14 494	19 641	590
2003	362 400	306 107	13 839	19 781	588
2004	365 665	309 440	13 600	20 006	593
2005	365 614	308 917	13 666	20 227	591
2006	367 274	311 543	13 606	20 137	594

Source: Kraffahrt-Bundesamt (until 1991), Statistisches Landesamt Baden-Wuerttemberg

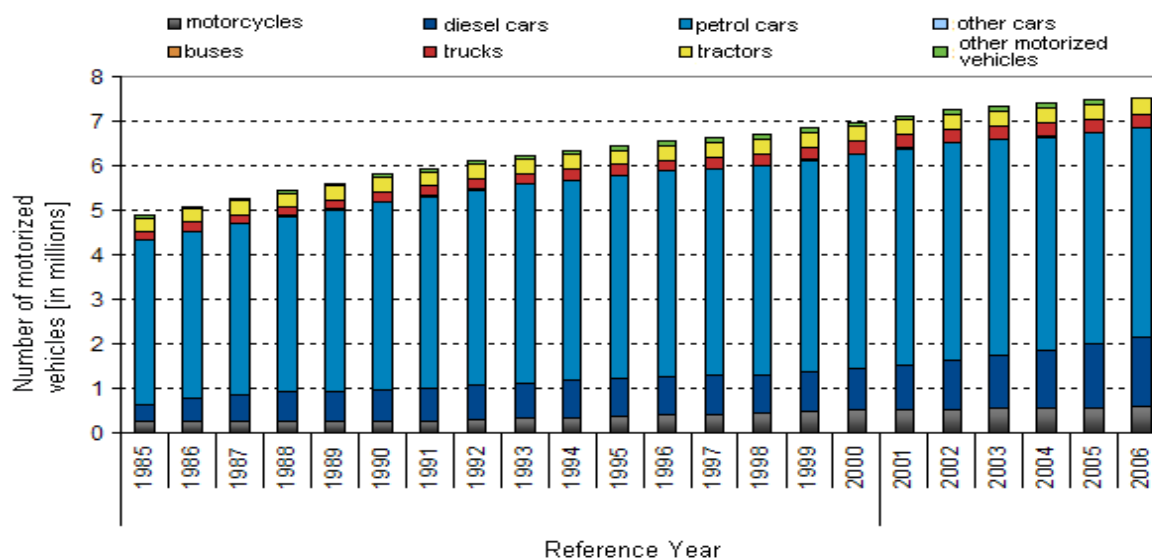


Fig. 1: Number of vehicles registered in Baden-Wuerttemberg

The impact potential for the mediation of car-pooling for commuters was estimated very carefully in former studies (ISCOM¹). On the basis of empirical surveys it was assumed that only a part of the employed persons (about 10%) would be sensitive towards the subject and intend to participate in car-pooling. Only a part of these persons, about one half, would finally convert their intentions into practice. Based on these assumptions it is possible - depending on the incentive to car-pool - to avoid 0.6% - 2% of commuter trips by car; this corresponds to about 0.4% - 1.3% of the vehicle mileage.

¹ European Commission, 5th FWP, IST-11425/71425

B3 Actual implementation of the measure

Pendlernetz - Stuttgart

Willkommen im Pendlernetz!

Bildung von Fahrgemeinschaften

So funktioniert es:
 Zuerst registrieren, dann wird das Passwort zugemailt, dann mit dem Passwort und E-Mail Adresse einloggen. Start- und Zieladresse eingeben, Fahrtzeit nicht vergessen und los geht die automatische Partnersuche. Bei Erfolg werden Sie per mail oder SMS benachrichtigt.
 Haben Sie keinen Fahrgemeinschaftspartner gefunden, verbinden wir Sie gerne mit efa-bw, möglicherweise bietet der Öffentliche Nahverkehr für Sie eine Alternative.
 Unter Angebot und Gesuche finden Sie die aktuellen Inserate. Wenn Sie selber inserieren - als Fahrer oder Mitfahrer - haben Sie die besten Chancen einen Partner zu finden.
 Informationen über rechtliche und versicherungstechnische Fragen finden Sie unter dem Menüpunkt "Service".

Wir wünschen Ihnen, dass Sie bald eine nette Fahrgemeinschaft finden!

Gleich registrieren und alle Funktionen nutzen können!

Suche nach Mitfahrgelegenheiten

von	nach
<input type="text" value="Göppingen"/>	<input type="text" value="Stuttgart Mitte"/>
Datum	Uhrzeit
<input type="text" value="06.06.2008"/>	<input type="text" value="07 h 15 min"/>
<input type="button" value="Gesuche"/>	<input type="button" value="Angebote"/>

- Startseite
- Angebote
- Gesuche
- Inserat eingeben
- Registrieren
- Service
- Nutzungsbedingungen
- Feedback
- Hilfe
- Einloggen

E-Mail / ID:

Passwort:

▪ Passwort vergessen?

Service der Landeshauptstadt Stuttgart
 Amt für Umweltschutz
 Gaisburgstr.4
 70182 Stuttgart

Fig. 2: Stuttgart Pendlernetz – Starting page for the user

The measure was implemented in the following stages:

- **Stage 1: Development and set-up of a communication and marketing concept** to promote the car-pooling service (01.02.2005 – 31.08.2005). The concept outlines a recommended action plan, investigating the problem fields, target definitions and communication lines. *Pendlernetz* as a service of the City of Stuttgart, funded by the European Commission, should motivate citizens to change their travel behaviour and use car-pooling as an effective, fast method to reduce traffic. The aim was to make the service *Pendlernetz Stuttgart* well-known to the maximum extent and to attract as much regular system users as possible by improving the system (www.stuttgart.de/pendlernetz). The action plan identified different action periods including the following steps:
 - Improvement of the online service (user-friendly Internet service),
 - installation of a service area (extension by information and download area),
 - Improvement of the marketing slogans (promote the advantages of the system, positive arguments),
 - organization of support by public media (PR campaigns),
 - and involvement of local administrations.

The registered user can enter his/her travel data. The system calculates suitable trips right down to street level. Personal preferences are considered as well as time and cost requirements in a defined route corridor. The user receives the entire route on a map including passenger collection and drop-off points. Notification is done via email and SMS. In the example, the user searches for car-pools from Göppingen to Stuttgart.

- The media Internet, direct (customer) communication, print media, development of a corporate identity including logo, fonts etc. were presented in the communication plan

including suggestions for posters, leaflets and other communication material (like key tags with Pendlernetz and CIVITAS logo, videos, newsletter, online-commuter-campaign, banner, online-advertisement, audio-advertisement, container). The concept was accompanied by a comprehensive collection of material to provide a broad data basis. The marketing and promotion of this measure is closely related to Measure 11.4 Sustainable Mobility Marketing.



© City of Stuttgart – Environmental Protection Office, 2005

Fig. 3: Regional catchment area of Stuttgart car-pooling service (100 km around Stuttgart)

The following list outlines the main marketing actions developed:

- Interview with local press “Stuttgarter Zeitung (Sept. 2006)
- Radio interview “Die Neue 107,7“ (Oct. 2006)
- Hanging of bridge – banner (Oct./Nov. 2006)
- Video at display panel Neckarstr./Schwabengarage (Nov. 2006)
- Set-up of marketing campaign (Nov. 2006)
- Production of flyer and poster (Jan. 2007)
- Bridge-banners (Jan. 2007)
- Distribution of print media (Feb. 2007)
- Mailing to all companies in Stuttgart (Mar. 2007), altogether about 400 letters
- Response of 60 companies ordering marketing media – Mar-May 2007
- Mobility-Day – Sept.2007
- Video displays at urban railway stations (underground) – Sept.2007
- Info-desk at the opening of the new trade fair – Oct. 2007
- Online-Advertisement at the Stuttgarter Zeitung Nov. 2007
- Presentation in Kaunas / Lithuania
- PR for selected magazines (Dec. 2007): IHK-Wirtschaftsmagazin
- Relaunch of Pendlernetz website with integrated event-data pool (April 2007)
- Press releases, (Apr./Jun./Oct. 07)
- City-lights (big promotion panels installed at central points in Stuttgart), 01/2008.
- Marketing campaign for Pendlernetz “Face of the Year” started Nov.2007 until March 2008.
- Mailing to all cities within the region (360) – Febr. 2008

- PR in “Stuttgarter Zeitung – Apr. 2008.
- Presentation in Mendrisio , Region Ticcino /Switzerland – May 2008.
- Presentation in summer university, Stuttgart – Jun. 2008.
- Presentation for companies (22 participants) in the *ecofit* programme – Jun. 2008.
- Presentation in the Baden-Wuerttemberg Ministry for the Interior (18 participants) – Jun. 2008.
- Presentation/workshop in the municipality of Filderstadt – Jun. 2008.
- Poster presentation at the network for mobility – Sep. 2008.
- Workshop of the club of mobility managers in the city hall concerning the exchange of experience with the Pendlernetz – 22.Sep.2008, the European mobility day.
- Advertisement within the soccer stadium of VfB Stuttgart, Sept./Oct. 2008 (video and newsletter).

Marketing campaign Pendlernetz Stuttgart (integrated on the Internet site of Pendlernetz)



Fig. 4: “Be the face of the year 2008” –campaign on www.stuttgart.de/pendlernetz

- **Stage 2: Analysis of commuters within the region of Stuttgart** and analysis of number of event tourists in the region of Stuttgart (01.09.2005 - 30.04.2006). The car-pooling service with an explicitly local reference for event traffic is a novelty. Moreover, the service is available on the car-pooling Internet platform. The identification and description of users groups is essential for a target-oriented marketing of the service. Within the framework of a comprehensive thesis for diploma² event tourists were analyzed including, among others, target group analysis, i.e. identification and description of potential target groups of a car-pooling platform for Stuttgart event traffic. These potential target groups were classified as event tourists, as car-pooling-affine road users, and as Internet-users. The study focuses on the location of Stuttgart and takes the particularities of the region into account. The study provides a systematic and target-oriented analysis of all surveys up to now, summarizing the main characteristics of the identified user groups and deriving typical characteristics of the target group of the new car-pooling platform
- **Stage 3: Extension of the system** for applications in connection with big events and integration of intermodal information (information on public transport):
 - Integration of the regional access to the Pendlernetz (31.01.2006 - 31.01.2007)

² Carolin Alice Zimmer, Car-pooling-Plattform im Eventverkehr. Handlungstheoretische Zielgruppenanalyse für die Implementierung einer innovativen Verkehrsdienstleistung., Diplomarbeit, Dezember 2005.

- Implementation and test phase of event data pool in Pendlernetz (Jan 2007- Nov 2007)
- Demonstration activities of the online system:
 - Test of the online system during
 - Football World Championship 2006 in Stuttgart (1 June – 31 Aug. 2006)
 - Cycle World Championship 2007 in Stuttgart (Sept 2007)
 - Test runs of event-oriented car-pooling during big events in Stuttgart (local soccer games of premier league, Spring Feast on Canstatter Wasen, etc.).
 - The following event dates were announced:
 - 2007-02-10 VFB Stuttgart: Werder Bremen / Gottlieb-Daimler-Stadion
 - 2007-02-23 VFB Stuttgart : Hertha BSC / Gottlieb-Daimler-Stadion
 - 2007-03-10 VFB Stuttgart : VFL Wolfsburg / Gottlieb-Daimler-Stadion
 - 2007-03-23 Porsche Oldie Night / Porsche Arena / Gottlieb –Daimler –Stadion
 - 2007-04-14 VFB Stuttgart : Hannover 96 / Gottlieb-Daimler-Stadion
 - 2007-04-21 Stuttgarter Frühlingsfest (Spring fair) / Cannstatter Wasen
 - 2007-05-19 VFB Stuttgart: Energie Cottbus
 - 2007-05-31 Herbert Grönemeyer live / concert / Gottlieb-Daimler-Stadion
 - 2007-06-28 Genesis / concert / Gottlieb-Daimler-Stadion
 - 2007-07-29/22 Summer Theater Days / Bohnenviertel Stuttgart
 - 2007-09-30/25 World Bicycle Championship
 - 2007-10–28/26 Opening Trade Fair
 - 2008-8-23 VFB Stuttgart : Bayer Leverkusen
 - 2008-08-31VFB Stuttgart : Hannover 96
 - 2008-09-20 VFB Stuttgart : Karlsruher SC
 - 2008-10-4 VFB Stuttgart : Werder Bremen
 - 2008 -10- 25 VFB Stuttgart : VFL Bochum
 - 2008 -11-1 VFB Stuttgart : 1.FC Köln
 - 2008-11-15 VFB Stuttgart : Arminia Bielefeld
 - 2008-11-29 VFB Stuttgart : FC Schalke 04
 - 2008-12-13 VFB Stuttgart : Bayern München
 - Demonstration with regional authorities and enterprises and special training workshops (01.02.2005-31.01.2009: permanent activity throughout the project lifecycle, including also training workshops with project participants: About 17 (bigger) events up to the end of year 2007, e.g. DaimlerChrysler (2005/2006 followed by integration into INTRANET platform), Bosch Stuttgart, SONY Stuttgart, Regierungspräsidium Tübingen (June 2006), presentation and demonstration at the Mobility Day in Stuttgart organized by Regierungspräsidium Stuttgart (July 2006), demonstration during European Mobility Actions Days (16 –22 Sept. 05)
 - 1 round table discussion about clean air (12/3/2007)
 - 1 presentation at workshop “Pendlernetz for Germany” (20/6/2007 in Frankfurt)
 - 2 demonstration workshops at the Stuttgart Mobility Centre with project participants (2007), demonstration for “Europe on Tour” group (29/7/2007) organized in the framework of the European Project “Schaustelle Europa”, 1-day-demonstration at “Energy Day” of Baden-Württemberg, 3-days demonstration at the New Fair opening (19-21 Oct. 2007),
 - 1 presentation workshop at CIVITAS Forum in Kaunas) Lithuania (3.-5. Nov. 2007).
 - Presentation in Mendrisio, Region Ticino /Switzerland – May 2008
 - Presentation in summer university, Stuttgart – Jun. 2008
 - Presentation for companies (22 participants) in the *ecofit* programme – Jun. 2008
 - Presentation in the Baden-Wuerttemberg Ministry for Transport (18 participants) – Jun. 2008

- Presentation/workshop in the municipality of Filderstadt – Jun. 2008
- Poster presentation at the Network for Mobility – Sep. 2008
- Workshop of mobility managers from big companies in the city hall concerning the exchange of experience with the Pendlernetz – 22.Sep.2008, the European Mobility Day.

B4 Deviations from the original plan

The deviations from the original plan comprised:

- **Regional access/Event data pool:** The regional access development was in time, but the implementation was delayed to Month 24 due to organisational (legal) clarifications (originally planned for M12).
- **Event data pool** (planned M12) was delayed to Month 25 due to internal household problems: the release of financial means was delayed and subcontracting could not be concluded as planned to develop and implement the event car-pooling feature.

B5 Inter-relationships with other measures

The measure is related to other measures as follows:

- **M11.4 – Sustainable mobility marketing in Stuttgart** - communication on new car-pooling products
- **M6.3 Policy options for access restrictions in Stuttgart** – Contribution in keeping emission thresholds (part of action plan of Clean Air Programme)
- **M.12.7 Event-oriented traffic management in Stuttgart** - Offer to event tourists

C Evaluation – methodology and results

C1 Measurement methodology

C1.1 Impacts and Indicators

Evaluation Category	N ^o	Indicator	Units	Source of data	Methodology for indicator construction (survey, modelling, etc)	Baseline Date
Society	13	Awareness level	No of registrations etc.	Environmental Protection Office	Survey Statistics (monthly): Sent SMS, number of users	03/07 (monthly)
Society	14	Acceptance level	No of feedback forms	Environmental Protection Office	Personal feedback form (by email)	06/06 (daily)
Transport		Service demand		Environmental Protection Office	Statistics (monthly): number of car-pooling requests. Statistics (monthly): number of matched carpools.	03/07
Transport	29	Modal split between private vehicles/PT (for commuters and for important events)		SSP Verband Region Stuttgart	Calculation Statistics	10/06 1996

Detailed description of the indicator methodologies:

- **Awareness level** – Number of registered users/trips, site requests, car-pool requests (before/after public awareness campaign), SMS statistics
- **Acceptance level** – Personal feedback form (daily): Level of acceptance and satisfaction available from personal feedback form in the system.
- **Service demand:** Statistics (monthly available)
- **Modal split between PT and private vehicles** (for commuters and for important events): statistics, calculation

C1.2 Establishing a baseline

The data for the baseline come from various sources. For awareness and acceptance level the regular statistics of the online system on number of users, number of requests/offers (regular/once), statistics on email service used (number of emails, SMS), as well as the personal feedback form are used. Moreover a short survey (interview) was carried out among users of the Stuttgart Mobility Centre in 2007 and in 2008 (see below).

C1.3 Building the business-as-usual scenario

Due to lack of an actual consistent traffic model for Stuttgart, results from a former project on car-pooling applications will be used (ISCOM³).

C2 Measure results

The results are presented under sub headings corresponding to the areas used for indicators – economy, energy, environment, society and transport.

C.2.1 Economy

-

C2.2 Energy

-

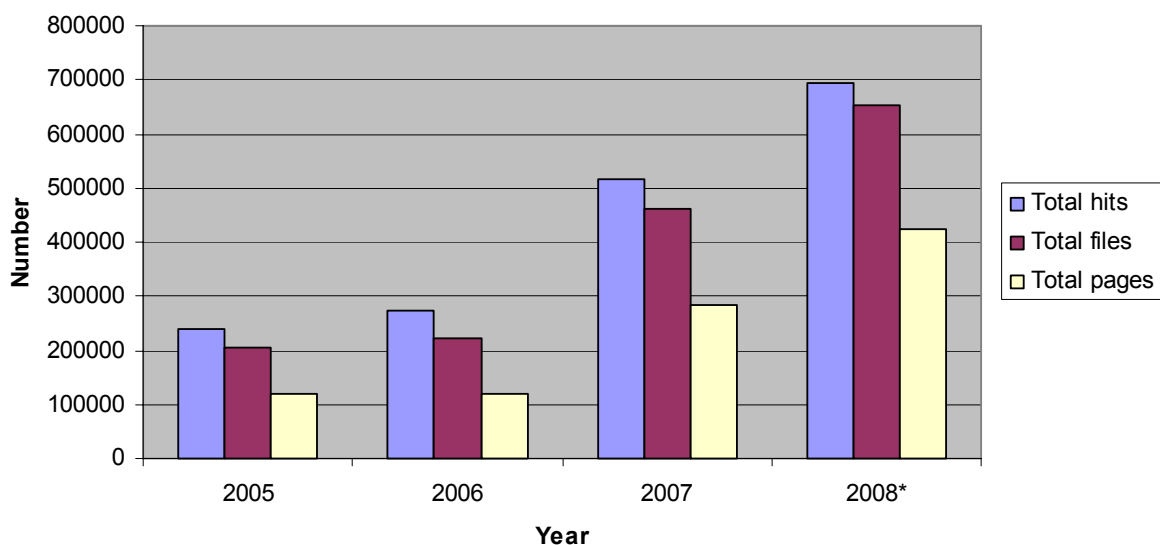
C.2.3 Environment

-

C2.4 Transport

Indicator service demand: Summary on the number of requests to stuttgart.pendlernetz.de

Statistics on hits, files, pages



*Data available until mid 2008 - Number multiplied by factor two (will be updated in Jan. 2009).

Source: City of Stuttgart Environmental Protection Office

Fig. 5: Usage statistics of stuttgart.pendlernetz.de 2005 – 2007

User interactions on the Pendlernetz system are continuously collected as anonymous statistical information. This information can be retrieved by the operator daily. The variable “pages” counts the number of different IP-addresses, which have sent requests to the server – not the number of real users. “Files” shows all successful requests to the server (the homepage is visible at the user’s computer) whereas the column “hits” lists every request to the server. This information can be interpreted as the overall number of clicks on the

³ European Commission, 5th FWP, IST-11425/71425 ISCOM– Information systems for combined mobility management in urban and regional areas.

homepage stuttgart.pendlernetz.de; it is an indicator for the demand for the car-pooling service and the level of awareness towards the system, even though the real number of persons using the service cannot be precisely derived, but nonetheless, a tendency is apparent. Especially from March 2007, the level of awareness rose significantly. After this point, clicks on the homepage remain on a stable and higher level than before.

The following figure gives the absolute values for the period June 2007 until June 2008:

Month	Daily				Monthly						
	Hits	Files	Pages	Visits	Sites	kB F	Visits	Pages	Files	Hits	
June 2008	2562	2423	1718	160	1838	370355	4822	51545	72701	76861	
May 2008	2071	1987	1439	420	3631	305732	13041	44632	61599	64201	
Apr 2008	2133	2006	1266	437	3563	313125	13119	38004	60200	63993	
Mar 2008	2231	2090	1268	325	3797	354335	10077	39338	64814	69175	
Feb 2008	1309	1170	666	152	1841	511185	4431	19327	33958	37961	
Jan 2008	1141	1056	594	149	1893	510631	4620	18426	32762	35373	
Dec 2007	1023	932	636	150	1694	526610	4650	19726	28904	31719	
Nov 2007	2625	2423	1599	189	2193	1103288	5686	47999	72705	78772	
Oct 2007	1346	1206	714	135	2026	637117	4197	22149	37392	41727	
Sep 2007	1231	1126	708	113	1392	566111	3395	21244	33802	36930	
Aug 2007	1512	1388	835	109	1669	1002744	3397	25892	43033	46897	
Jul 2007	1309	1220	806	109	1287	983541	3384	25004	37828	40608	
Jun 2007	1229	1146	741	117	1335	531192	3536	22244	34403	36879	

Source: City of Stuttgart Environmental Protection Office (2007/8)

Fig. 6: Usage statistics of stuttgart.pendlernetz.de June 2007 - June 2008

Fig. 6 shows all hits on stuttgart.pendlernetz.de that are counted permanently. The sum of the hits represents the total amount of the requests, which were directed to the server within the period of time. Accordingly this figure can be interpreted as an indicator of the awareness and acceptance level of the car-pooling system Pendlernetz. Between Oct. and Dec. 2007 the number of hits amounted to 80 000, which is a quite remarkable figure. During that time the new fairground in Stuttgart was opened on the occasion of which the car-pooling system was promoted by the Stuttgart fair company "Neue Messe" on their Internet site as well as by several press releases and local radio announcements on "Antenne 107.7". Moreover the system was presented during the 3 days event (stand), followed by press articles afterwards, as the Stuttgart Mayor visited the stand and highly appreciated the system.

An overview on the top 14 hits according to countries is given in Fig. 7 exemplary for May 2008.

Top 14 of 14 Total Locations											
#	Hits		Files		kB F		kB In		kB Out		Location
1	7288	60.30%	7254	61.89%	26770	46.20%	-0	0.00%	-0	0.00%	United States
2	4076	33.72%	3770	32.16%	26428	45.61%	-0	0.00%	-0	0.00%	Germany
3	527	4.36%	504	4.30%	3283	5.67%	-0	0.00%	-0	0.00%	Unresolved/Unknown
4	67	0.55%	66	0.56%	165	0.29%	-0	0.00%	-0	0.00%	France
5	37	0.31%	37	0.32%	629	1.09%	-0	0.00%	-0	0.00%	Norway
6	30	0.25%	29	0.25%	104	0.18%	-0	0.00%	-0	0.00%	Japan
7	18	0.15%	18	0.15%	232	0.40%	0	0.00%	0	0.00%	Denmark
8	17	0.14%	17	0.15%	159	0.28%	-0	0.00%	-0	0.00%	Great Britain (UK)
9	10	0.08%	10	0.09%	27	0.05%	-0	0.00%	-0	0.00%	Hungary
10	8	0.07%	8	0.07%	27	0.05%	-0	0.00%	-0	0.00%	Turkey
11	3	0.02%	3	0.03%	51	0.09%	-0	0.00%	-0	0.00%	China
12	2	0.02%	2	0.02%	0	0.00%	0	0.00%	0	0.00%	Austria
13	2	0.02%	2	0.02%	43	0.07%	-0	0.00%	-0	0.00%	Switzerland
14	1	0.01%	1	0.01%	25	0.04%	-0	0.00%	-0	0.00%	Canada

Source: City of Stuttgart Environmental Protection Office 2008

Fig. 7: May 2008 top 14 hits according to countries on *stuttgart.pendlernetz.de*

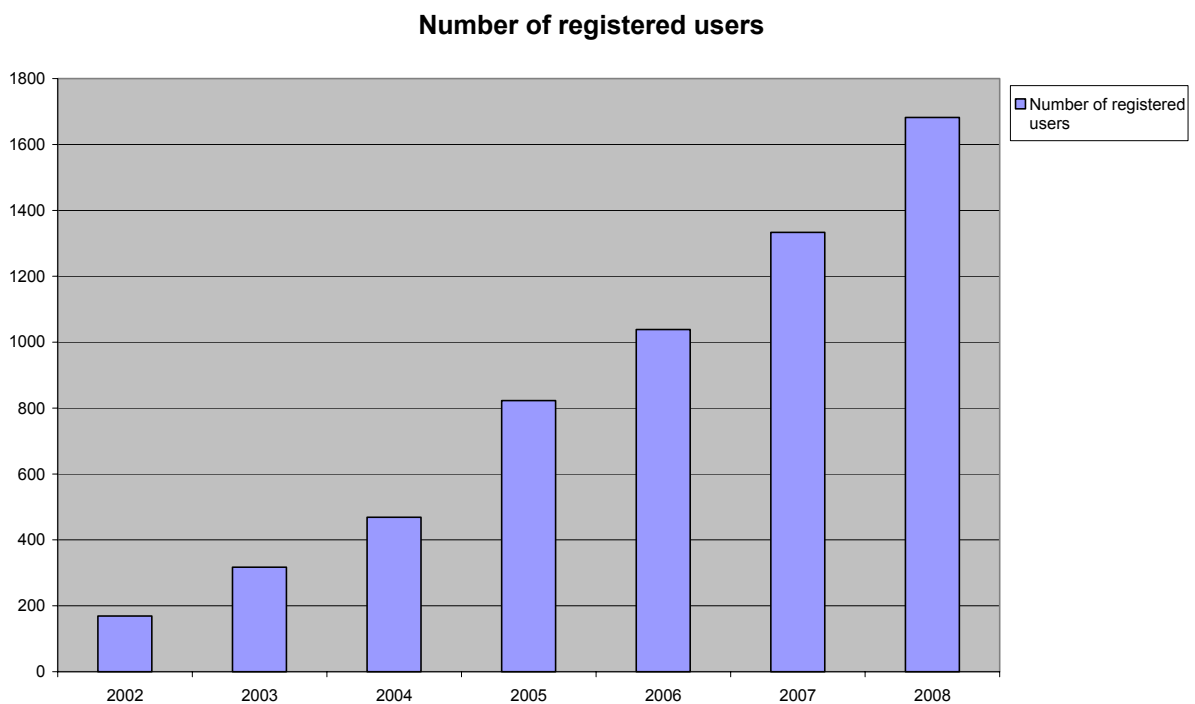


Fig. 8: Number of registered users since 2002.

Fig. 8 gives the total number of registered users per year since 2002, which increased constantly every year, mainly in 2005 to 2008.

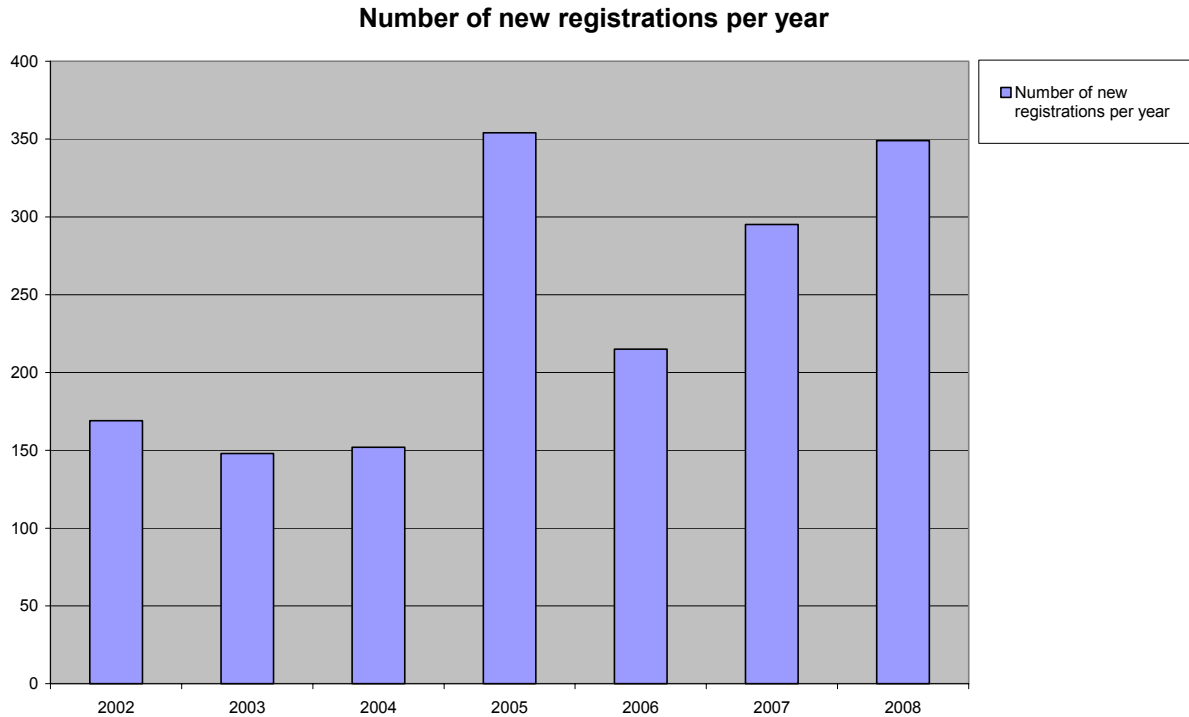


Fig. 9: Number of new registrations per year since 2002.

Fig.9 shows the number of new registrations every year since 2002. Altogether 1682 users have registered in the system up to now; main growth in 2005, 2007 and 2008.

- **Number of matched car-pools**

The following Fig. 10 indicates the total matches per year that have been found between offers and requests registered in the Stuttgart online car-pooling system. The number of matches may serve as an indicator for the amount of successfully built carpools. “Matches” means “matched trips” between offered and requested trips and followed by the direct contact between the persons offering a certain trip and those requesting that certain trip. The contact is established either by email or SMS.

In 2007, for example, a total of 59.005 requested and offered trips was registered, altogether 230 matches were recorded in 2007, i.e. 0.4%.

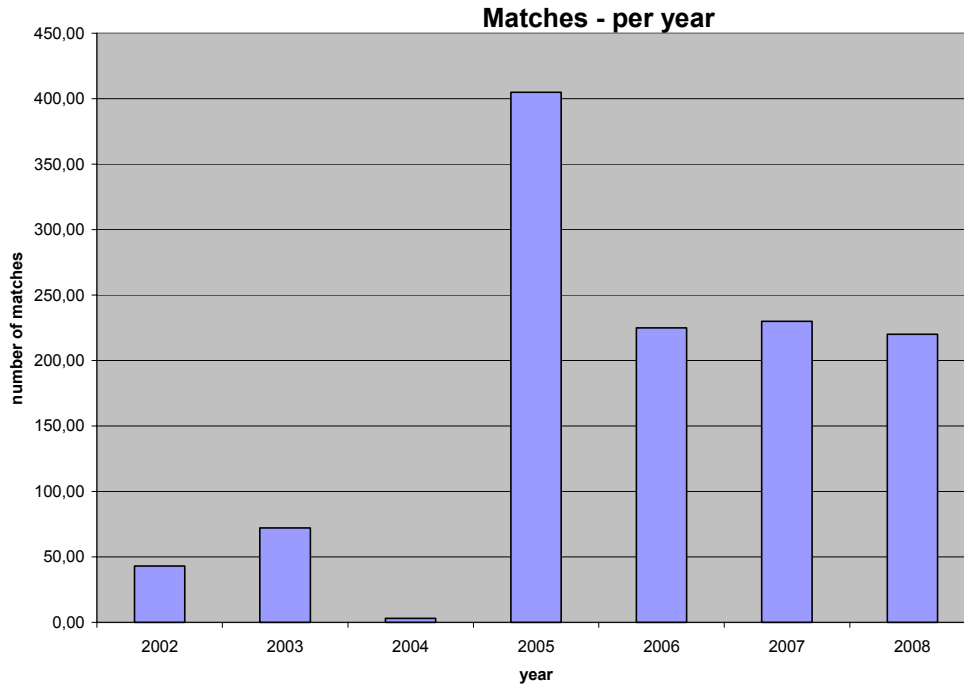


Fig. 10: Stuttgart Pendlernetz - Matches per year (2002 – 2008).
 (Note: Number in 2004 is not relevant due to system failure times).

Indicator: Modal split between private vehicles/PT (for commuters and for important events)

Fig. 11 shows the main mode of transport of inhabitants of the Stuttgart Region to their workplace (1996). The overall modal split for commuter trips and trips to big events shows 63.5% for the car (as driver). One of the main aims of car-pooling is to reduce the amount of private vehicle traffic and to increase the occupancy rate in private cars in the region of Stuttgart.

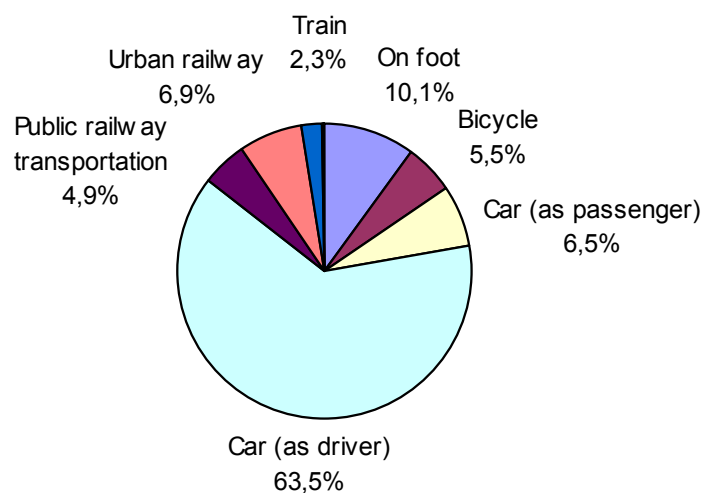


Fig. 11 : Indicator modal split between private vehicles/PT (for commuters and for important events) in Greater Stuttgart (1996)

Source: Verband Region Stuttgart Regionalverkehrsplan 1996

Due to the fact that actually there exists no newly calibrated traffic model for the city of Stuttgart, nor was this planned for CARAVEL evaluation, results from a former project with car-pooling application are used.⁴

The influence of the ISCOM information services on private vehicle traffic (PVT) in the region of Stuttgart is shown in Figure 12. The abbreviations mean: SCM – Stuttgart Congestion Management; EFA – Electronic timetable information for public transport (Elektronische Fahrplanauskunft).

- There is a reduction of private vehicle traffic by around 7.2 million vehicle trips/a because of shifts from private vehicle traffic (PVT) to public transport (PT). These shifts are caused by the push and pull effects of the ISCOM systems SCM and EFA (e.g. there is a huge congestion in private vehicle traffic (SCM information) and there is a good direct connection in public transport (EFA information)).
- There are shifts by around 1.2 million person trips/a from public transport (PT) to private vehicle traffic (PVT). Also these shifts are caused by the push and pull effects of the ISCOM systems SCM and EFA (e.g. there is no good direct connection in public transport (EFA information) and there is no congestion in the road network (SCM information)).
- There is a reduction of private vehicle traffic (PVT) by around 4.0 million vehicle trips/a because of travel renouncement which is only an impact of the Stuttgart Congestion Management (SCM), (e.g. there is a huge congestion in the road network (SCM information) and a person does not want to ride by public transport and decides to stay at home).
- There is a reduction of the private vehicle traffic by around 1.3 million vehicle trips/a because of changes to the car-pooling for commuters.

⁴ European Commission, 5th FWP, IST-11425/71425 ISCOM– Information systems for combined mobility management in urban and regional areas.

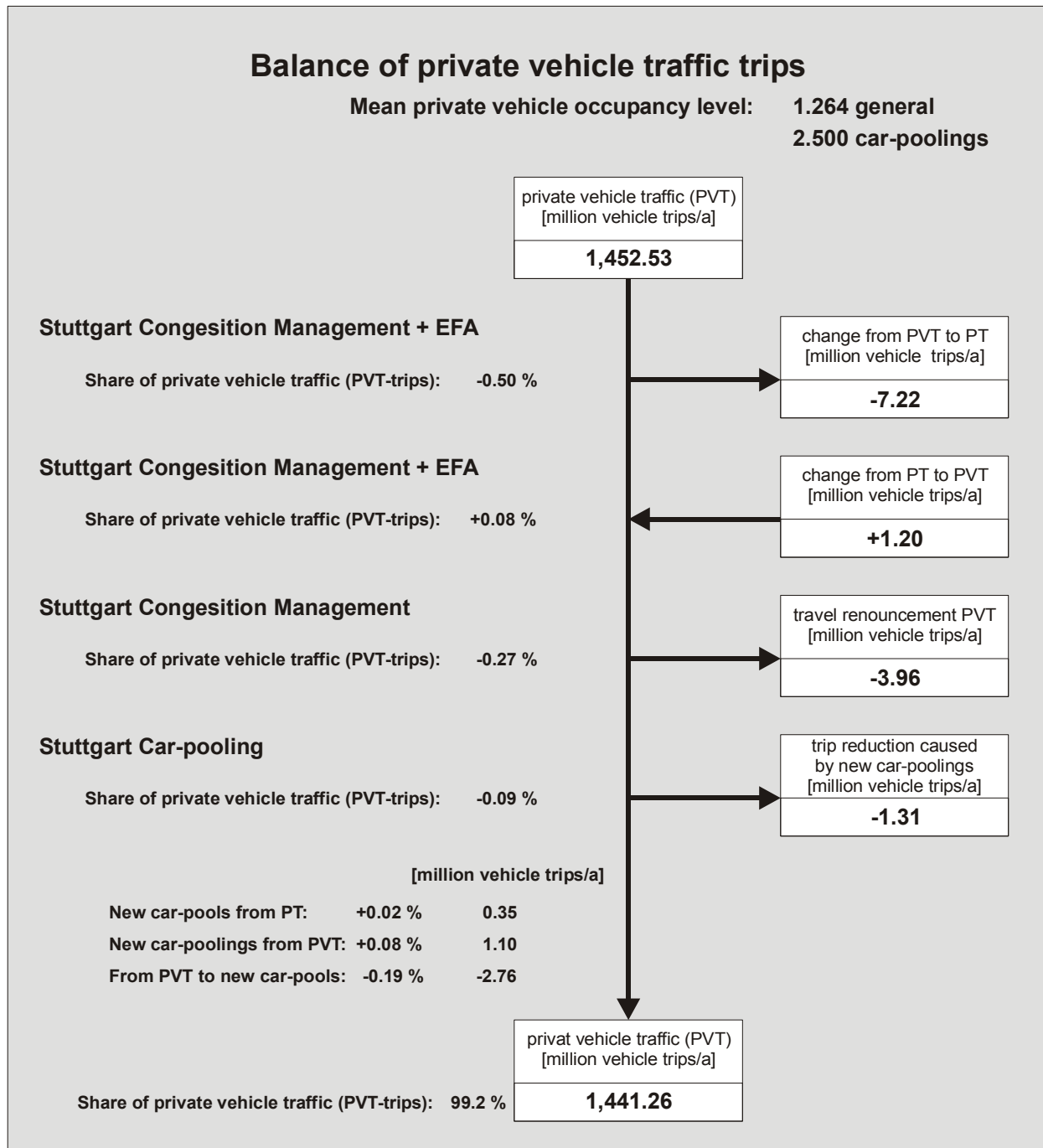


Fig. 12: Balance of private vehicle traffic (Stuttgart Region)

The balance of the private vehicle traffic shows a total reduction of the vehicle trips by 11.3 million trips/a for all services (SCM, EFA, car-pooling). This is 0.8% of private vehicle traffic. Car-pooling alone is estimated to reduce private vehicle traffic up to 0.09% (net-effect).

There are shifts between private vehicle traffic and public transport because of the ISCOM information systems as shown in Figure 13.

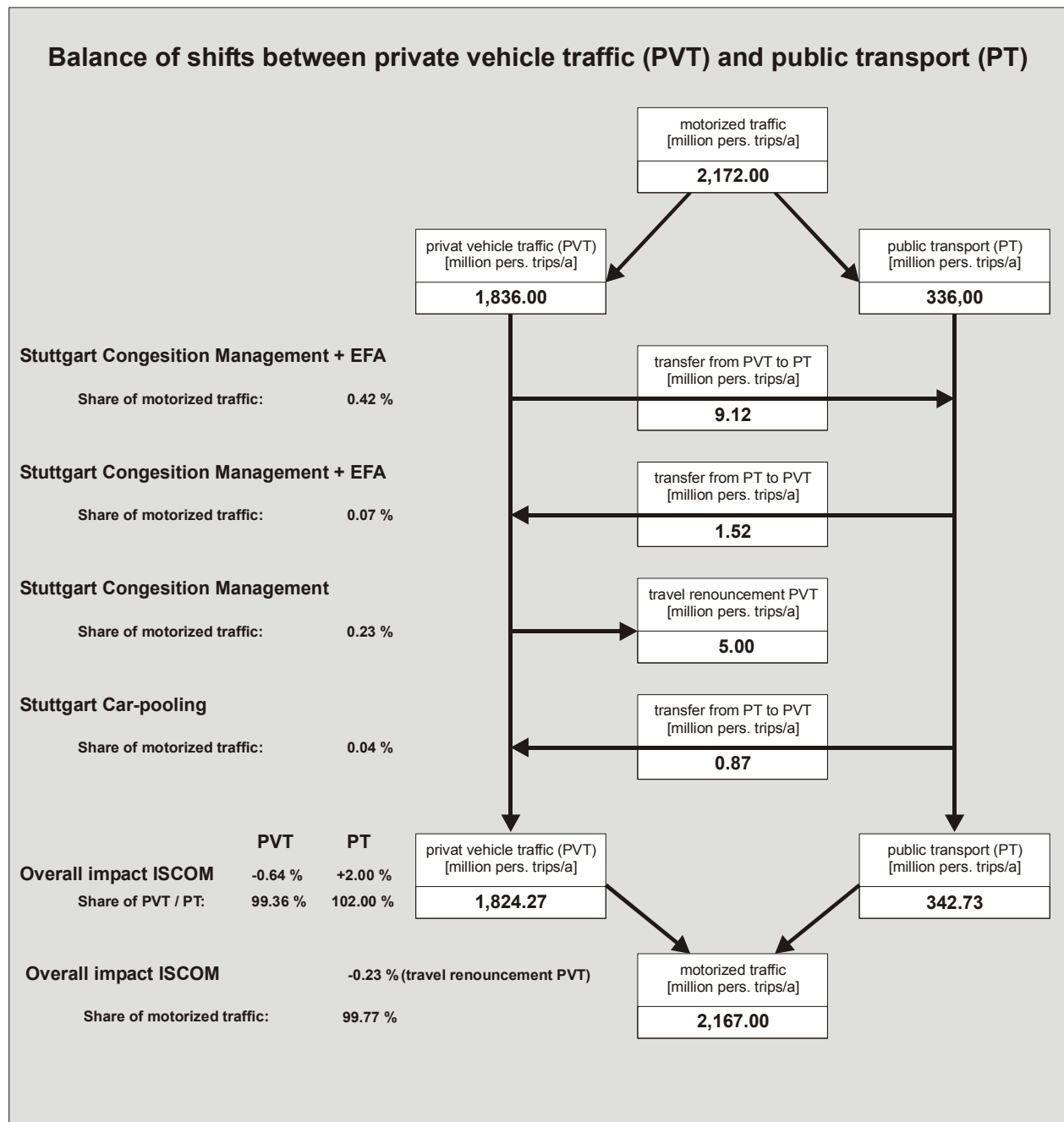


Fig. 13: Balance of shifts between private vehicle traffic and public transport (Stuttgart Region)

C2.5 Society

Indicator acceptance level: Registered journeys (offers/requests)

The following figure (Fig. 14) presents the usage statistics of all registered trips per quarter, distinguished after offers and requests, managed by Pendlernetz per month. As an example, the development is compared with the prices for premium gasoline and crude oil. The curve was introduced for comparing the usage of Pendlernetz and the costs for refueling a car. A correlation is barely visible, rather not existing. During the period between May 2005 and August 2006 the trend was even opposed.

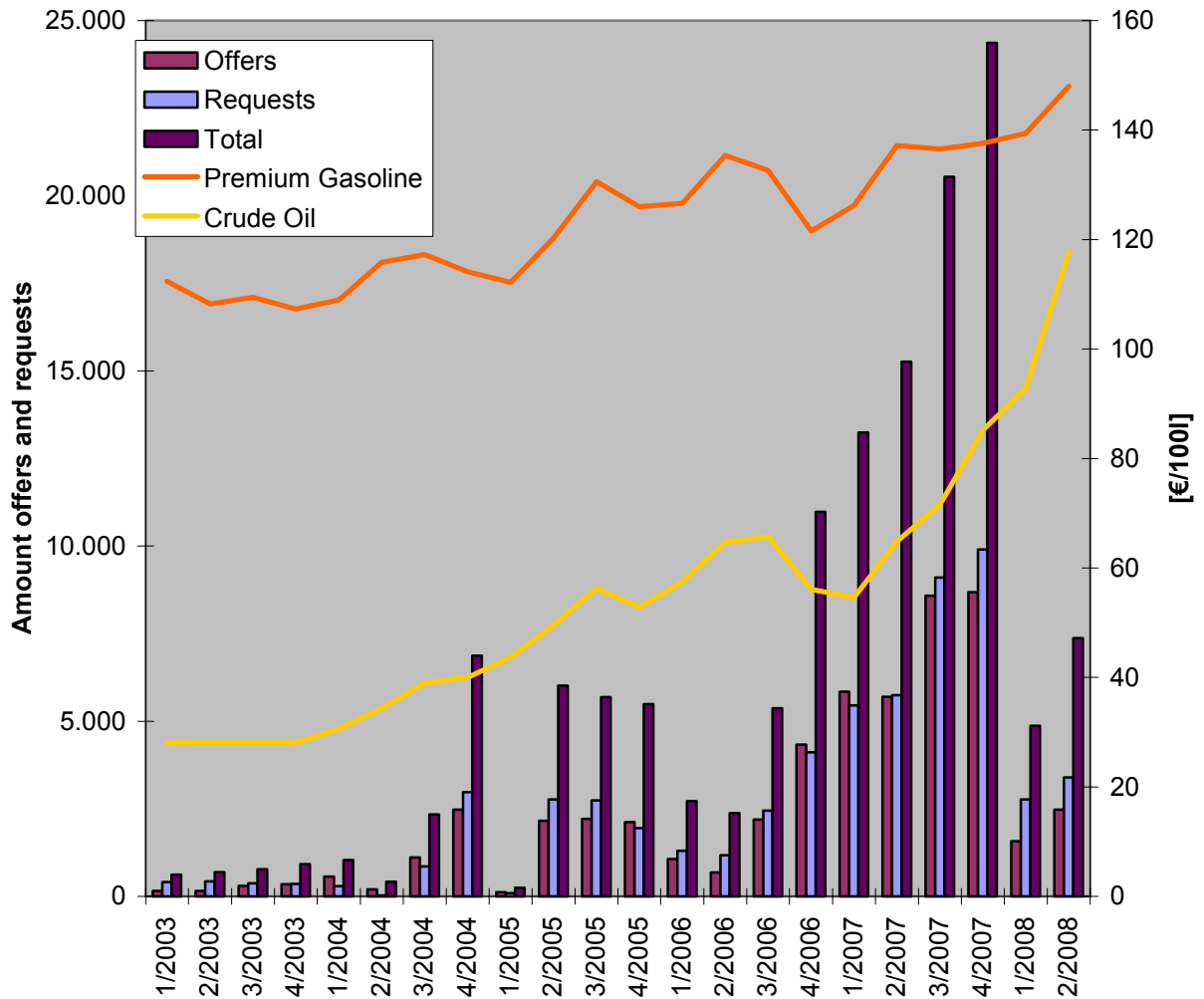


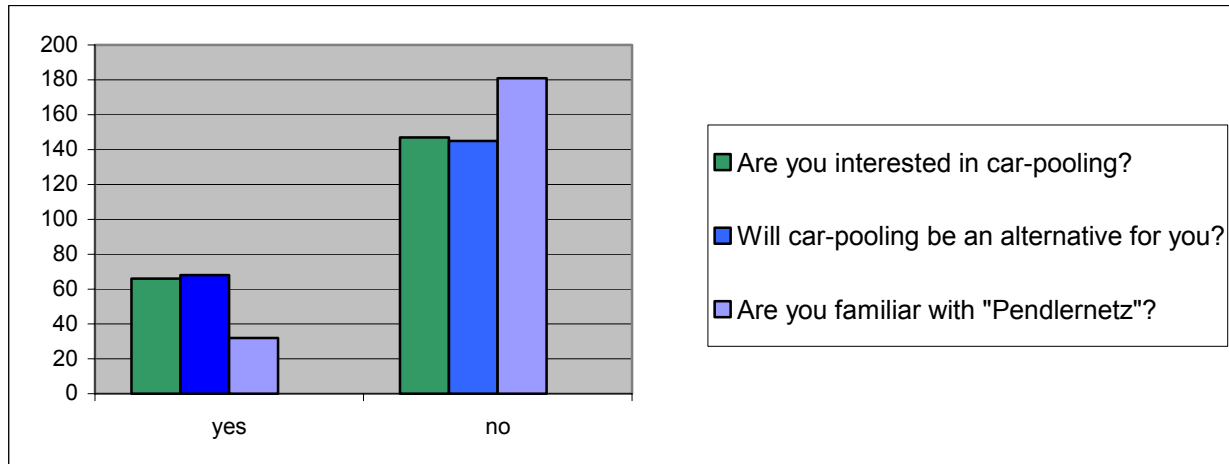
Fig. 14: Pendlernetz - registered trips per quarter and development of fuel/crude oil price

Source: City of Stuttgart Environmental Protection Office 2002 – 2007

Indicator awareness level: Survey

Two short surveys were carried out during the CARAVEL Project among users of the Stuttgart Mobility Information Centre. The first survey was carried out in 2007, the second in 2008, about one year later.

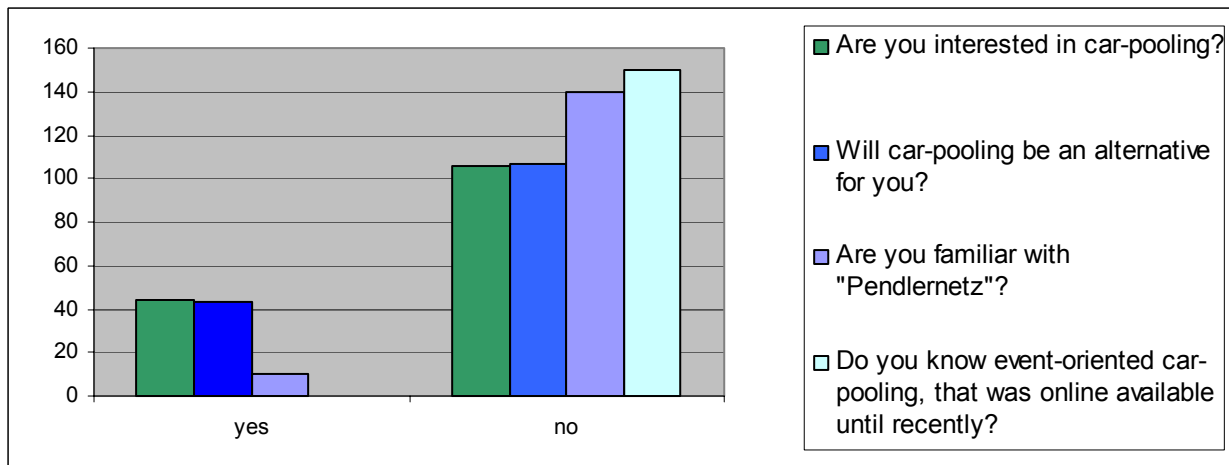
The surveys point out the awareness level of “car-pooling” in Stuttgart. In the first survey about one third of the interviewed are interested to take part in car-pooling. For almost one third, car-pooling would be an alternative. Only around 15% know that “Pendlernetz” already exists.



Source: City of Stuttgart Environmental Protection Office 2007

Fig. 15: Survey among clients of the Stuttgart Mobility Information Centre (personal interviews). Period: 28 Feb.07 – 31 March 07, between 9:00 – 18:00

The 2nd survey after about one year shows quite similar results as around one third is interested in car-pooling and almost one third indicate car-pooling as an alternative. One of the most frequent comments was that car-pooling was a good alternative in view of the rising fuel costs. However, only 7% stated to be familiar with Pendlernetz, whereas the event-oriented car-pooling feature is not known at all. A reason for this (rather disappointing) result might be based in the fact that the survey among the users of the Mobility Information Centre did not primarily include commuters, but mainly tourists or clients (often elderly persons) seeking mobility information in the form of personal advice, without having access to Internet.

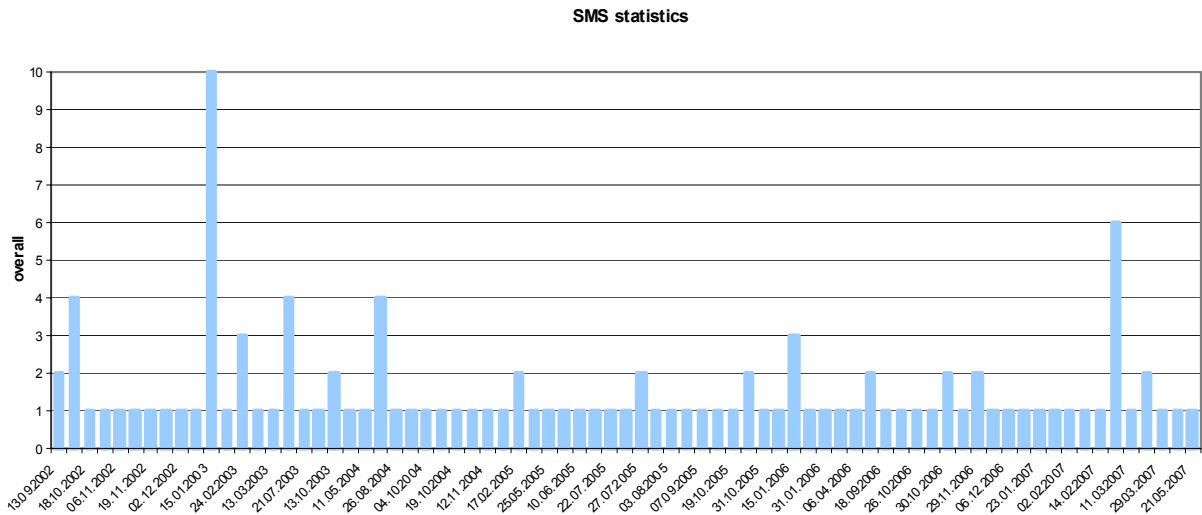


Source: City of Stuttgart Environmental Protection Office/SSP 2008

Fig. 16: 2nd survey among clients of the Stuttgart Mobility Information Centre (personal interviews). Period: 2 June - 5 June 2008, between 9:00 – 18:00

- **SMS alert service**

The usage of this service has been very low up now; the service is either not very well-known within the Pendlernetz community or not requested.



Source: City of Stuttgart Environmental Protection Office 2007

Fig. 17: Pendlernetz statistics on SMS alert service

- **Personal feedback form (email)**

82 feed-back mails were sent during the period 05/2005 -08/2008. Mostly the mails concerned a temporary dysfunction or problems in finding the correct address, so the problems could be solved very quickly. Some compliments of the good and necessary service were also sent.

C3 Achievement of quantifiable targets

No.		Rating
1	<p>Increase in the number of users/trips of the car-pooling system: activation of 10 000 regular users of Pendlernetz targeted, which is the critical mass to find a matching partner.</p> <ul style="list-style-type: none"> Stuttgart targets to activate 10 000 regular users of the car-pooling system Pendlernetz, which is the critical mass to find a matching partner. <p>Altogether the number of regular users (= registered users in the system) could be increased during the past few years (see statistics in Chapter..... However, the target of 10,000 users has not been achieved completely.</p>	* Partially achieved
2	<p>Increase in the demand for environmentally-compatible mobility services in general.</p> <ul style="list-style-type: none"> The measures should increase the public awareness for car-pooling as an effective, comfortable transport mode on 10% of the citizens of Stuttgart and increase the demand for environmentally-friendly mobility services in general. <p>The demand for environmentally-friendly mobility services could be increased from 18,000 in 2005 to about 26,500 requests in 2007, i.e. by 47% during the past few years (for details, see M11.4 Sustainable Mobility Marketing). The requests for the car-pooling system alone increased from about 220 000 hits on the car-pooling site in 2005 to about 700 000 in 2008.</p>	***
3	<p>Reduction of motorized private vehicle traffic, (fuel consumption, congestion, emissions)</p>	* Partially achieved
4	<p>Extension of the Internet-based car-pooling system by event- oriented destinations/regional access portal for the user groups of all cities in the region/ about 15 big events/year that are connected with the car-pooling service.</p> <ul style="list-style-type: none"> About 15 big events/year that are connected with the car-pooling service. <p>The event-oriented car-pooling was successfully implemented and included big events like Cannstatter Frühlingsfest, opening of New Fair Stuttgart and in close cooperation with the local premier soccer club VfB Stuttgart all home matches of the club.</p>	**
<p>NA = Not Assessed * = Not achieved ** = Achieved in full *** = Exceeded</p>		

C4 Up-scaling of results

- Baden-Württemberg-wide extension of Pendlernetz
- German-wide standardization/extension of Pendlernetz
- European-wide extension of Pendlernetz
- Event-data pool for every soccer game in Stuttgart (VfB Stuttgart)
- Event-data pool for every mega-event

C5 Appraisal of evaluation approach

Traffic-related impacts of single indicators cannot empirically be determined in a reliable way, which is due to methodological reasons. Actually a calibrated transport model for the city of Stuttgart does not exist (nor was this planned for evaluation for CARAVEL).

C6 Summary of evaluation results

The key results are as follows:

Key result 1 – Increase in the awareness and acceptance level among private companies and public institutions in Stuttgart and in the Region of Stuttgart with regard to the online car-pooling system Stuttgart Pendlernetz. The awareness level among private companies in Stuttgart and in the Stuttgart Region could have been raised considerably during the project life cycle. Thus big companies like DaimlerChrysler, Bosch, SONY Deutschland and Hewlett Packard, all located in Stuttgart, integrated the system directly into their Intranets and supported promotion actions (flyers, system presentations, posters etc.) within their companies.

Altogether 35 companies in Stuttgart and the Region have currently integrated on their web sites a link to Stuttgart Pendlernetz.

Also among public institutions the awareness level has grown, about 30 cities and communities have meanwhile set a Pendlernetz link on their web sites. Moreover the great success can also be seen in the efforts to build up a Baden-Wuerttemberg-wide car-pooling system, which is envisaged by the Baden-Wuerttemberg Ministry of the Interior at the moment.

This also supported by the installation of a Baden-Wuerttemberg-wide and Germany wide working group “Pendlernetz” with the vision of introducing a Germany-wide system in system.

Key result 2 – Improvement of the contents of the system (programme) as well as technical upgrading and enhancement. The web site of Stuttgart Pendlernetz has been continuously upgraded by new features and services (email, SMS alert, regional access, event data pool), increased user friendliness, and the possibility for users to feedback their criticism about the system (technical, service-related).

Key result 3 – System enlargement by developing and testing the regional access and event-oriented car-pooling. Both have been successfully implemented and tested. However the overall result of event-car-pooling during the test phase was not that as satisfying as expected in the beginning. Despite several marketing campaigns (radio announcements, banners, videos at highly frequented roads, newsletters, commuter campaign (face of the year), press releases etc., (for details please see MERS 11.4 Mobility Marketing Stuttgart) the service was not very well recognized among the users. There are several reasons: During the Football World Championship 2006 the FIFA blocked the idea of advertising the system as planned in the stadium and the public viewing areas due to their restrictive behaviour, only sponsors were allowed for advertisements; nevertheless on the official Internet site, the link to the car-pooling system was integrated though. The local soccer club VfB has also not supporting the idea of advertising the service on the stadium screen so far (activities to “win” the club are still on-going). Experience showed that such big events have to be available for the users all the time, each big event like a soccer game must be found by the user at the same place and all the time.

D Lessons learned

D1 Barriers and drivers

D1.1 Barriers

Financial/political barrier – A resolution of the municipal council (political agreement) is needed to obtain the necessary financial means for operating and maintaining the car-pooling system (achieved for the CIVITAS project period; approval of the measure by integrating it into the urban transport and climate protection policy).

User assessment (awareness/acceptance) – Car-pooling is a new transport service and therefore it has to be communicated very intensely. High efforts for marketing the service are needed to increase awareness and acceptance of the service, to overcome bias, and to reach as much users from different target groups (commuters, visitors of big events) as possible.

Organizational barrier – A very big number (about 10 000) of registered users is needed in order to find a matching partner for car-pooling.

D1.2 Drivers

Actual transport situation – with respect to congestion, particularly during peak hours, scarce parking spaces and environmental pollution, 750 000 commuters daily in the Stuttgart Region.

Actual air quality situation - and rising awareness of public with regard to air quality (PM 10).

Economic/financial situation (fuel costs) – that are constantly rising, reduction of fiscal benefits in 2007 in Germany (“Pendlerpauschale”).

Communication efforts in general with target groups (commuters/visitors), involvement of strategic multipliers (e.g. New Fair Stuttgart, Airport company Stuttgart) and image campaigns have been experienced as drivers.

Local political support – by municipal council and mayor by supporting public promotion (events), mailing actions and other PR-actions.

Local institutional/industrial support: The chamber of commerce turned out to be the right partner to communicate with companies. And companies have the image of themselves, that they are the right environmental protectors. As soon as a well-known company took part in the car-pooling programme, many others followed.

D2 Participation of stakeholders

System users

From the beginning “pendlernetz Stuttgart” was discussed with the (end) users as well as intermediate users (public institutions, private companies). The feed-back mails from the users helped to improve the system and showed their interest in the service.

Commuters – 765 000 commuters daily in the Stuttgart Region, around 205 300 enter daily into Stuttgart city, 57 400 commute daily into the region.

Visitors (big events) – Visitors of big events in Stuttgart (sportive events like soccer games of premier league, fairs, open-air festivals, concerts), usually around 60000 are expected to each soccer game of VfB Stuttgart.

Municipal/regional administrations – in the Stuttgart Region (6 administrative districts, “Landkreise”, with 2 663 660 inhabitants) and in whole Baden-Wuerttemberg with 35 administrative districts) have been involved through mailing actions supported by the mayor as well as through on-line presentations on various occasions.

Private companies – have been involved (consultations, exhibitions, promotion campaigns, mailing actions). Some of the biggest companies (Daimler Chrysler, HP, SONY) in Stuttgart have successfully integrated the system into their Intranets as a service for their employees.

Round Table Clean Air Stuttgart – The Pendlernetz was discussed by the Round Table on Clean Air and Noise Reduction by the Environmental Protection Office Stuttgart with the aim of climate protection. The members stated that car-pooling was a useful measure to improve the quality of the climate.

Local institutions: The chamber of commerce turned out to be the right partner to communicate with the companies in the Stuttgart Region. As soon as a well-known company took part in the car-pooling programme, many others followed.

D3 Recommendations

Recommendation 1 - The wider the action range of a car-pooling system is, the more attractive it is and the more users it has. The costs can be divided among or be taken over by a superior organization like a public administration or ministry.

Recommendation 2 – Event-oriented car-pooling only makes sense, if the event manager always provides a car-pooling data pool for every event, for example, for periodic events like soccer games every fortnight or Christmas markets once a year. The user has to be sure to find the event-oriented car-pooling data every time he/she looks for it. The data pool has to be available permanently and at the same place of the homepage.

The fuel costs will rise in future and thus the attraction of car-pooling will become more and more an attractive alternative means of transport, above all for the target group of commuters.

Recommendation 3 – Generally high or intensive marketing is needed through a professional promotion and PR approach to promote the system/address target groups.

D4 Future activities relating to the measure

One of the next steps will be the state-wide promotion of the car-pooling system, which means all over Baden-Wuerttemberg. The state government already analyzes the possibilities for an extension of the system’s range and its integration as a web-link into the Intranet-sites of all public institutions in Baden-Wuerttemberg.

A Germany-wide solution will be prepared by the German Ministry of Transport as well. At the moment a common platform for all German car-pooling systems is under preparation. The objective is to make the different systems compatible.

For the year 2015 a Europe-wide car-pooling system is very likely to be realised.