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# ESTIMATING FOREIGN VISITORS FLOWS FROM MOTORWAYS TOLL MANAGEMENT SYSTEM

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## **Objectives and scope of the method**

The information about the flows of foreign visitors to France is of major interest for institutional and professional tourism actors at the regional and local level, as it is the basis for their decisions concerning either their promotion campaigns abroad or their investments. Any national system of survey, because of the huge sample sizes requirements involved in the perspective of getting reliable estimates at a detailed geographical and temporal level, has got limitations of its own to this respect. This applies to the French tourism border surveys just as well as to any similar system in other countries.

Therefore, it was crucial, from the viewpoint of the economy of the tourism sector, to find a alternative way to identify the presence of foreign visitors on the French territory with as much accuracy as possible concerning the period and the zone concerned. Considering the dominant role of private car as a mode of access for most of the European visitors of France, especially for the nationalities with the higher number of visits, the cooperation built by ODIT France, a public agency in the field of tourism, with French motorway companies is the first successful attempt in that direction.

From the first contacts established with APRR network in 2001, it took about five years to establish this cooperation with all the major companies operating the French toll motorway network, covering the whole of the continental regions at the exception of Brittany entirely served by a network of free highways (*see map and synopsis of data available underneath*).

At present, estimates are available for seven motorway networks : in addition to APRR, this includes SANEF covering the Northern and Eastern part of the French territory by which foreign visitors from the North of Europe access to France, ASF covering mostly the Southern part and serving therefore among the major tourist areas of the metropolitan territory, AREA covering the Alpine area, Cofiroute serving the West and South-West regions, ESCOTA serving the French Riviera and SAPN covering Normandy.

The coverage of the territory is indeed not perfect for two reasons : some regions are only partially served at the level of the major road network by toll motorways, such as Aquitaine (free highway through Landes area) or Alsace (free highway along the Rhine axis); some minor motorway companies have still to be involved in the cooperation, such as the recent ALIS network linking the COFIROUTE, ASF and SAPN networks, as well as singular toll passages such as North Alpine tunnels, viaduc de Millau or river bridges in Normandy. However good indications can be already provided about the visits of most of the tourist areas by the system as it is at present.



- 7 motorway networks cooperating
- Up to 7 years available starting January 2001

## Data available

Network	Class 1	Class 2
<b>APRR</b>	Jan 2001 → Dec 2007	July 2002 → Dec 2007
<b>AREA</b>	Oct 2002 → Dec 2004	Oct 2002 → Dec 2004
<b>ASF</b>	Jan 2001 → March 2008	Jan 2001 → March 2008
<b>COFIROUTE</b>	July 2004 → Dec 2007	July 2004 → Dec 2007
<b>ESCOTA</b>	Jan 2005 → Dec 2007	Jan 2005 → Dec 2007
<b>SANEF</b>	Jan 2003 → Dec 2007	Jan 2003 → Dec 2007
<b>SAPN</b>	Jan 2004 → Dec 2007	Jan 2004 → Dec 2007

### The estimation process

The basis of the estimations is the payments at toll barriers by credit card. The Autoroutes Paris Rhin Rhône (APRR) experienced first the coding of the nationality of the bank on which the payment is made, based on the BIN code file provided and regularly updated by the Crédit Mutuel d'Alsace acting as the common bank of nearly all motorway companies for electronic payments.

Once this coding is made, the motorway company transfers each month to ODIT France an aggregated file extracted from the database of electronic toll payments and preserving the individual privacy, with as many lines as there are different possible cross-tabulations of the day of payment, the toll station to toll station stage on the motorway network, the fare class (distinct for campers and caravans from ordinary cars) and the nationality of the payment (see *figure below*).

The method developed by ODIT France aims at deriving from this very reliable knowledge on an exhaustive basis of a part of the visitors, an estimate of the corresponding total while preserving the level of detail of the primitive information.

## Format of the file provided to ODIT France by motorway companies

Toll class	Entrance toll station (Code)	Exit toll station (Code)	Entrance toll station (Name)	Exit toll station (Name)	O/D direction	Country Code	Transaction Number	Exit day	Total price
1	05004	09079	ALLAINES	CLERMONT-BARRIERE	Ex.	ITA	4	24-Aug-01	90.84
2	05004	09079	ALLAINES	CLERMONT-BARRIERE	Ex.	ITA	1	24-Aug-02	31.5
1	05004	09079	ALLAINES	CLERMONT-BARRIERE	Ex.	LUX	1	10-Apr-01	90.84
1	05004	09079	ALLAINES	CLERMONT-BARRIERE	Ex.	LUX	1	29-Jul-01	90.84
1	09112	09101	« Open » Toll System	MYENNES	En.	ESP	1	11-Oct-01	13,72
1	09112	09101	POUILLY-EN-AUXOIS	FLEURY-EN-BIERE	Ex.	CHE	2	08-Dec-01	27.44
1	09112	09101	POUILLY-EN-AUXOIS	FLEURY-EN-BIERE	Ex.	DNK	1	11-Apr-02	13,9
1	09112	09101	POUILLY-EN-AUXOIS	FLEURY-EN-BIERE	Ex.	DNK	1	21-May-02	13,9

In order to base the estimation of the rate of use of credit cards for toll payments, from which the corresponding total number of payments can be derived, ODIT France periodically orders in agreement with motorway companies counts at toll barriers and periods concentrating foreign traffic, most often at summer, according to the nationality of registration of the vehicles (*see counting sheet example below*). The comparison of these counts with the number of payments of the same nationality during the same period provides an estimate of the proportion of electronic payments during the counting period.

### Counts at Beaune-Sud (A6) of the number of vehicles by nationality of registration in class 1 on the 9 August 2003 from 12h to 21h

	12h-13h	13h-14h	14h-15h	15h-16h	16h-17h	17h-18h	18h-19h	19h-20h	20h-21h	Total
France	175	110	141	161	181	170	182	170	128	1418
Netherlands	13	22	16	14	19	22	20	10	9	145
Belgium	19	15	18	25	26	24	21	23	3	174
Germany	8	8	12	10	12	11	14	8	10	93
United Kingdom	15	20	19	17	40	37	42	18	5	213
Luxemburg	2	1	0	1	0	2	0	1	0	7
Denmark	3	0	0	0	1	1	0	2	0	7
Italy	2	3	8	4	5	13	9	3	3	50
Spain	1	0	2	3	3	1	2	5	1	18
Switzerland	3	3	4	4	6	4	3	3	2	32
Sweden	0	0	0	0	0	0	1	1	0	2
Austria	2	0	2	1	0	0	0	0	0	5
Poland	1	0	0	0	1	0	0	0	0	2
Liechtenstein	0	0	0	2	0	0	0	0	0	2
Monaco	1	0	0	0	0	0	0	1	0	2
Man island	1	0	0	0	0	0	0	0	0	1
Bulgaria	0	0	1	0	0	0	0	0	0	1
Slovaquia	0	0	0	0	0	1	0	0	0	1
<b>Total</b>	<b>246</b>	<b>182</b>	<b>223</b>	<b>242</b>	<b>294</b>	<b>286</b>	<b>294</b>	<b>245</b>	<b>161</b>	<b>2173</b>

In addition to the identification of the nationality by category of vehicle, the number of occupants of the vehicle is registered since 2003, in order to allow for estimates in terms of number of tourists, which is obviously a measurement unit of higher relevance for tourism issues than the number of vehicles.

Although the project focuses on foreign tourist visitors, the scope of these counts (*see figure below*) covers not only foreign vehicles but also French ones, not only tourism vehicles but also light goods vehicles for which the toll category 2 is applied. The reason is that these complements are necessary both for validating the counts and further on the estimates by cross-checking with toll system information from the motorway companies.

## Scope of the counts

		French	Foreigners
<b>TOLL CLASS 1</b>	• light vehicles	X	X
	• light vehicles + trailers or caravans < 2m high	X	X
	• small campers <2m high	X	X
	• goods vehicles <2m high	X	X
<b>TOLL CLASS 2</b>	• light vehicles + trailers or caravans >2m high	X	X
	• Campers >2m high	X	X
	• Light goods vehicles between 2 and 3m high	X	X

A systematic comparison of the total hourly counts by toll class with the data extracted from the toll management system is first processed, and gaps are investigated. Once the results of these investigations is considered satisfactory, a coefficient, as close as possible to 1 (*see example below*), is applied to the hourly counts by nationality in order to fully match with the total traffic registered by the company.

**Reliability check up and correction of counts for class 1 : the example of  
Beaune Sud on the 9 August 2003**

	Counts	Transactions	Gap	Correction coefficient
12h-13h	246	246	0,0000	1,0000
13h-14h	182	183	-0,0055	1,0055
14h-15h	223	222	0,0045	0,9955
15h-16h	242	246	-0,0163	1,0165
16h-17h	294	295	-0,0034	1,0034
17h-18h	286	289	-0,0104	1,0105
18h-19h	294	296	-0,0068	1,0068
19h-20h	245	244	0,0041	0,9959
20h-21h	161	163	-0,0123	1,0124
<b>Total</b>	<b>2173</b>	<b>2184</b>	<b>-0,0050</b>	<b>1,0051</b>

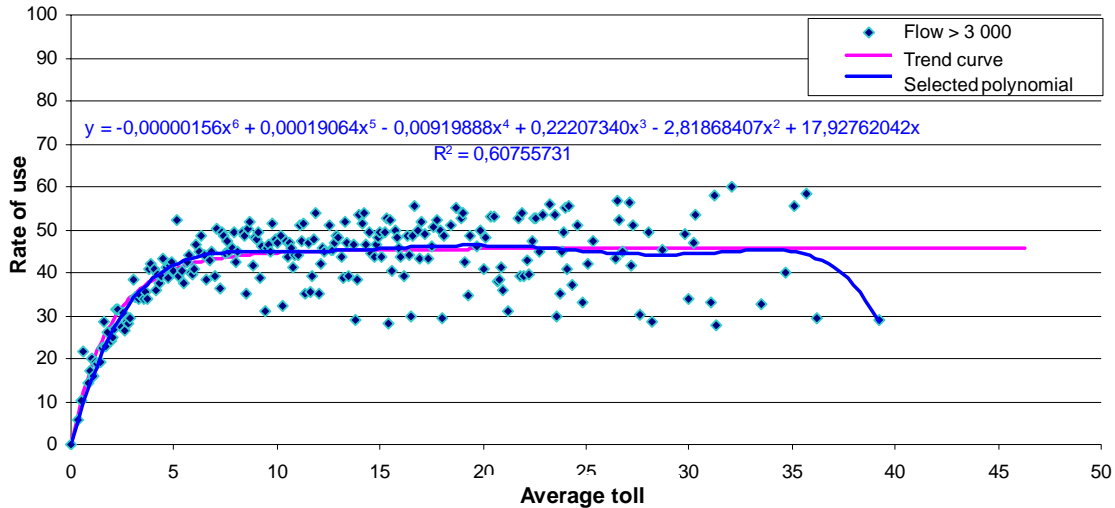
The general outcome of this process is that the rate of use of the credit card for a given year varies strongly from one nationality to another, but also for a specific nationality according to the motorway network and within a given network according to the toll barrier. In addition, it may also vary from one year to the other for a given nationality and toll barrier. Therefore, the estimation process has been built in order to take into account this variability.

This first implies for each nationality a distinct estimate for every year and every network, which basically means an update of the counts on a selection of toll barriers of each network. But it is clear that expanding this variability from a limited number of periods and toll stations to the whole year and to any territory supposes to identify a correlation mechanism applicable in all circumstances.

A specific estimation process is therefore conducted for each nationality, year and network, on the assumption of a correlation between the rate of use of credit cards and the amount of the toll. This process is based on two pillars:

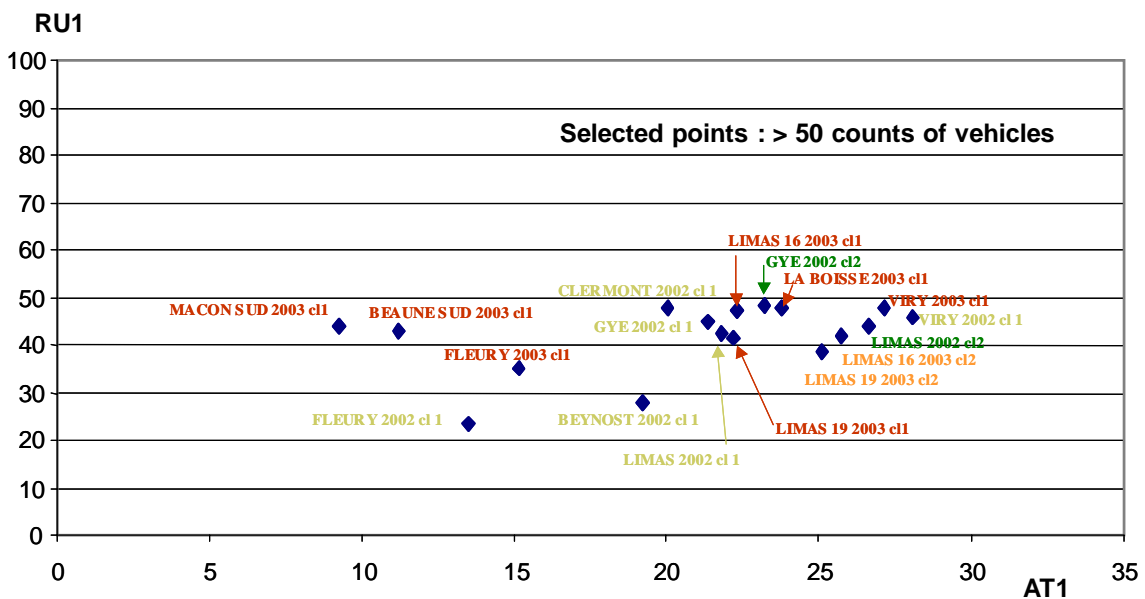
- the correlation between the rate of use of the credit card and the amount of the toll whatever the mean of payment and the nationality on the corresponding network during the month(s) of the counts (*see figure below*), which gives an idea of the general form of the curve of correlation between the rate of use and the amount of toll. An alternative consists in replacing toll values by origin-destinations on the motorway network, so that O/D with the same toll value will be differentiated.

**Correlation between amount of toll and rate of use of credit card, all nationalities together, APRR, class 1, in July 2003**



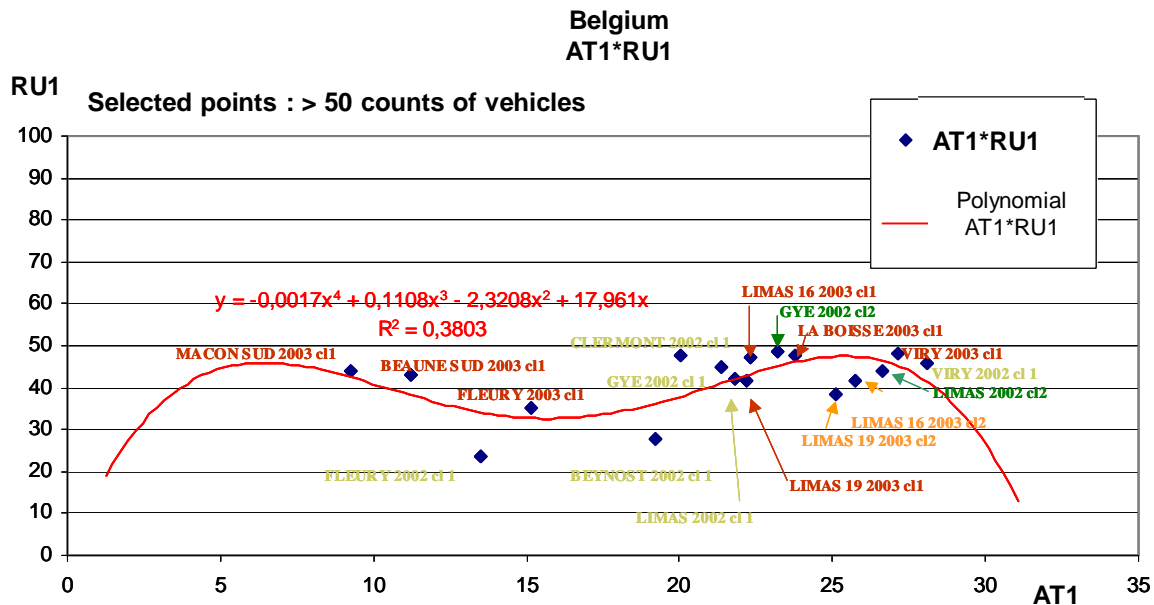
- the knowledge of the correlation between the average toll amount (AT1) and the average rate of use (RU1) of the credit card for each significant count, not considering cases where less than 50 vehicles of the considered nationality have been counted (*see figure below*), which provides a first indication of the variation of the rate of use of the credit card according to the amount of the toll. The estimate involves counts of previous years in order to benefit of the highest possible number of observed data to adjust the initial curve. However, the observed data of the estimation year are systematically favoured in the following steps of the adjustment process.

**Coordinates (average toll by credit card, average rate of use of credit card) according to the counts : the example of Belgium**



From the distribution of the points above a first correlation curve can be estimated (*see figure below*)

### Estimation of the Belgium law – 1st step : the example of APRR in 2003



The difficulty to overcome in the following steps of the process is to use the general knowledge, all nationalities together, of the correlation between the toll amount whatever the mean of payment and the rate of use of the credit card, knowing for each nationality only the correlation with the toll amount by credit card.

This has led to estimate the average toll amount all means of payment together (AT2) for each count of the considered nationality, by applying the ratio ‘average toll all nationalities together whatever the mean of payment during the counting period/ average toll all nationalities together by credit card during the counting period’. But this has in counterpart the drawback, for which no antidote has been found so far, not to take into account a likely minor gap of average toll between payment by cash and by credit card for those nationalities having a higher rate of use of the credit card.

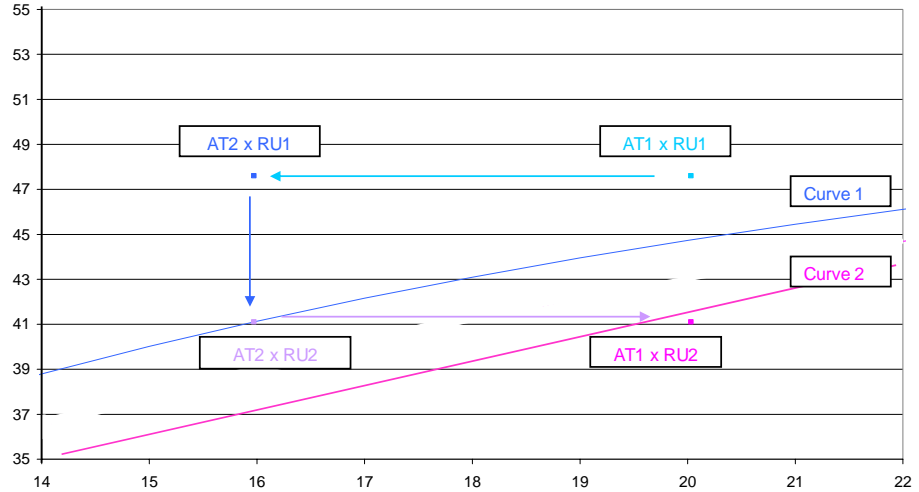
A new adjustment is then processed replacing AT1 by AT2. From the projection of AT2 on the adjustment curve, a new estimate of the rate of use of the credit card (RU2) is derived.

The final adjustment is estimated considering the points having for coordinates AT1 and RU2. Beyond an expensive toll value generally exceeding the highest average toll observed during the counting period of the year of estimation, a fixed asymptotic level of the rate of use of the credit card is adopted, as far as possible starting at an inflexion point of the curve in order to avoid a break in the rate of evolution of RU.

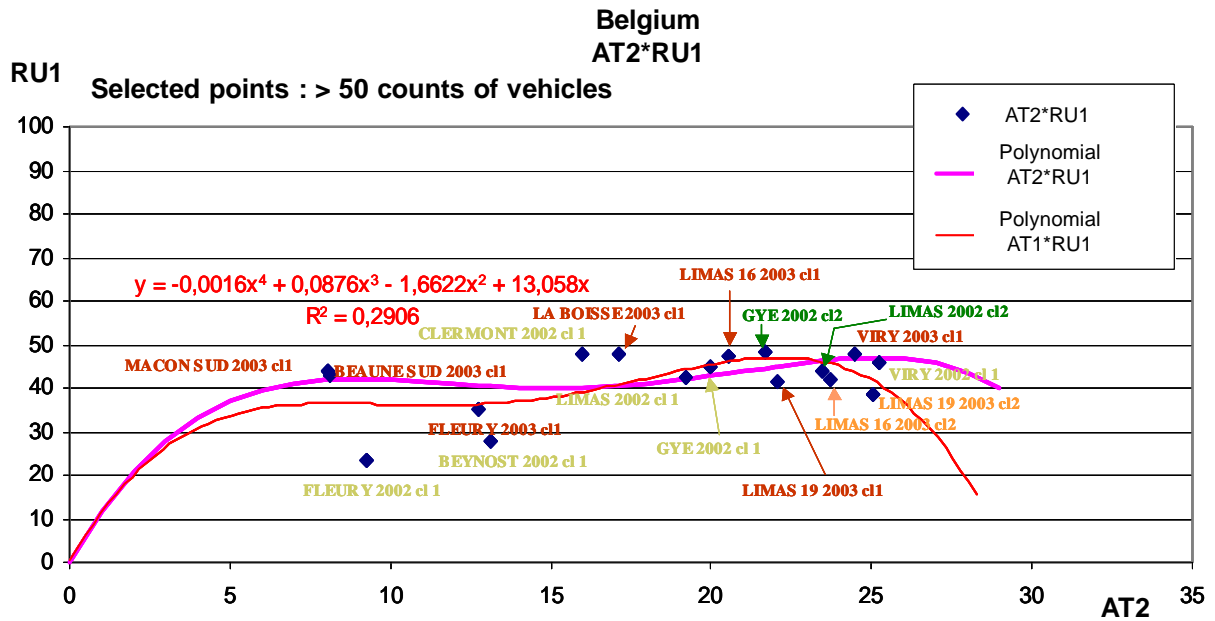
The figures below describe the general estimation process and illustrate the successive steps of this estimation.

### Scheme of the initial estimation process

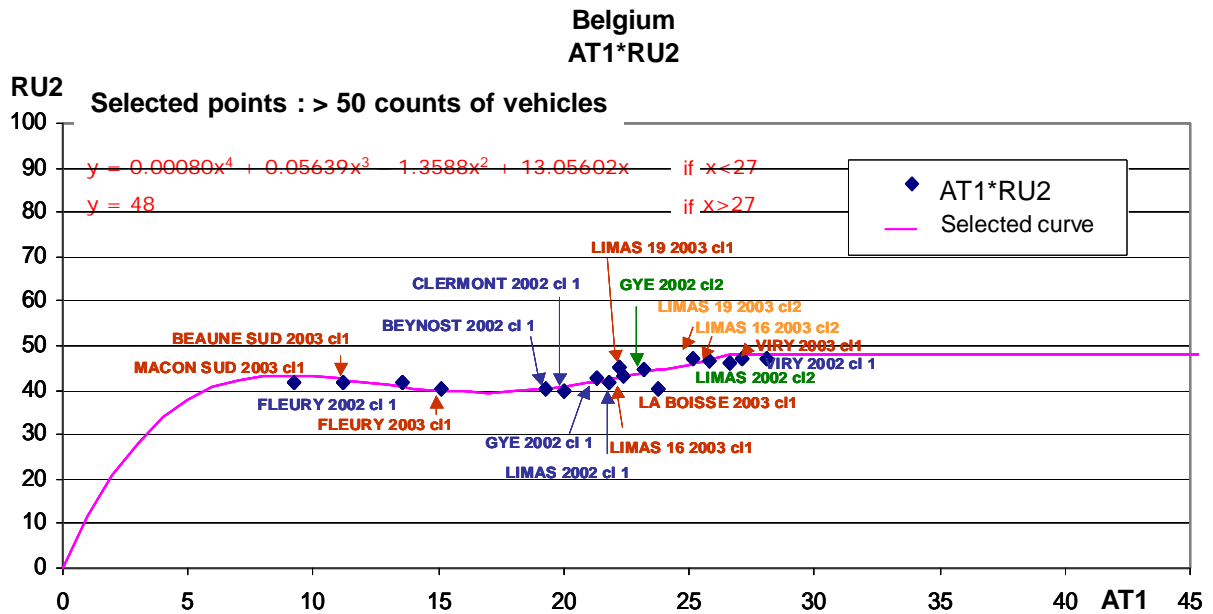
AT1 : Average Toll by credit card of the nationality during the counting period  
 RU1 : Rate of Use of the credit card of the nationality during the counting period  
 AT2 : AT1 \* ratio average tolls all nationalities together whatever the mode of payment and by credit card during the counting period  
 RU2 : Rate of Use obtained by projection of AT2 on the curve of adjustment to the points AT2\*RU1



### Estimation of the Belgium law – 2nd step : the example of APRR in 2003



## Estimation of the Belgium law – final step : the example of APRR in 2003



The variant chosen among those tested usually minimizes gaps with the number of vehicles resulting from the counts, paying a particular attention to the most numerous ones. But it also takes on board the preservation of the coherence of curve shapes over the years, unless there is some evidence that the payment behavior has changed in a different manner according to the toll amount.

The outcome is the estimation of a specific correlation equation for each of the nationalities for which at least 3 counts over 50 vehicles are available for the network and estimation year considered. It most often concerns United-Kingdom, Germany, Belgium, the Netherlands, Switzerland, Italy, Spain and Denmark.

Concerning minor nationalities, for which the number of significant counts available during the estimation year is not sufficient, the rule consists in choosing a reference nationality on the basis of some similarity in terms of geographical and economical features as well as of payment behavior. This reference nationality is Germany for Austria, Poland, Czech Republic and Hungary, Denmark for Sweden and Norway, Belgium for Luxemburg and Spain for Portugal. The method consists then in adapting the coefficients of the estimation curve of this reference nationality so as to locate on the curve the point having for coordinates: average toll of the minor nationality all counts of the estimation year together, average rate of use of the credit card of the minor nationality all counts of the estimation year together.

However, when the amount of vehicles all counts together proves itself insufficient, one of the following procedures is followed:

- estimation of the rate of use of the credit card for the average amount of toll of the minor nationality, by applying to the rate of use of the reference nationality for the same amount of toll the ratio (rate of use of the minor nationality / rate of use of the reference nationality) concerning the motorway network on which the number of counts of the minor nationality is the highest ;
- when the rate of use for a given year is not consistent with the trend between the previous and the following year, although the number of counts for these two years is acceptable, determination of the average point of the minor nationality by interpolation (which implies an ex post revision) ;
- when a nationality usually estimated specifically is for a given year of a minor kind without the possibility to use a reference nationality, adaptation of the coefficients of the curve of the same nationality for another motorway network on the same year or for the previous year on the same network, so as to locate on the curve the average point of this nationality all counts of the estimation year together.

Fixing the asymptote is most often obtained by respecting the proportionality between the minor and the reference nationality existing for the rate of use of the credit card corresponding to the average toll value of the small nationality, which implies as a consequence a start of the asymptote for the same toll value as for the reference nationality.

### **The validation procedure**

The second phase of the process is then devoted to the validation of these estimates.

The first major validation consists in checking the accuracy of the estimation of the traffic of each nationality during the survey period as compared to the counts (*see figure below*).

## Analysis of gaps between estimated flows and traffic of class 1+2 for each nationality at VILLEFRANCHE-LIMAS during the counting period on 19 July 2003

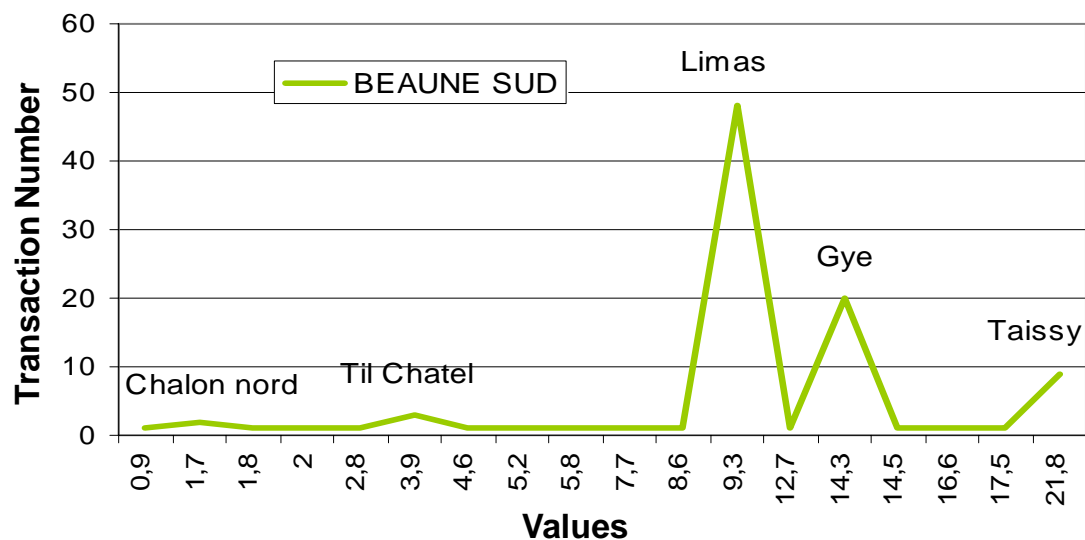
Nationality	Estimated traffic	Validated counts *	Gaps
NLD	4 973	4 905	1%
BEL	3 676	3 770	-2%
DEU	1 583	1 484	7%
GBR	780	712	10%
DNK	178	177	1%
LUX	155	147	5%
ESP	69	61	12%
CHE	44	44	NS **
SWE	21	39	NS **
ITA	36	34	NS **
NOR	20	20	NS **
POL	18	13	NS **
CZE	7	12	NS **
AUT	6	8	NS **
PRT	0	1	NS **
<b>Total</b>	<b>11 566</b>	<b>11 430</b>	<b>1%</b>

\* correction only for class 1

\*\*NS : Not significant (counts under the threshold of 50 vehicles)

In case of excessive gap between estimated flow and traffic during the survey period for a given nationality, the distribution of credit card transactions according to the amount of toll is investigated (*see figure below*), in order to focus the adjustments of the correlation curve on the areas where payments concentrate, assuming that the average toll amount might have as such no significance in terms of individual behaviour of the tourists concerning the choice of their mean of payment.

### Distribution of transactions according to the amount of toll for Belgium at Beaune Sud over the survey period (9h) on the 09 August 2003



The adjustment curves are consequently adjusted according to the findings of these new investigations, up to the moment when gaps with the counts are reduced to an acceptable level.

The second major validation relies on the capacity to reproduce the total traffic on the motorway network during the months when the counts are operated, by summing up the estimates of the 17 major foreign nationalities plus the French one (*see figure below*), taking into account the minor part of foreign traffic not estimated through a correction factor based on its proportion of the total foreign traffic in the counts.

### **Calculation of the gap between estimated flow and traffic in class 1 all nationalities together in July 2003 on APRR network**

Estimated flow (apart from ATMB internal flows, after extrapolation to all nationalities on the basis of the counts during the month) :	<b>8 945 717</b>
Traffic (including free transactions but apart from null tolls) :	<b>9 049 175</b>
<b>Ratio estimation/traffic :</b>	<b>0,99</b>

In case the ratio estimation/traffic is not as satisfactory as the one of the figure above, a further investigation is made, usually first concerning the estimation law for French vehicles, considering their relative weight in the total traffic of light vehicles.

An ultimate possibility of correction in case of remaining gaps consists in the identification of the types of days and of stations for which gaps are the most important, in order to adjust accordingly the correlation curve either of French vehicles only or of some other nationalities in addition (*see figure below*). Gaps much higher than in average are especially found in two circumstances:

- stations with a special incitation to pay by credit card, the extreme case consisting in stations with no longer any toll staff in cabins, payment by cash being only possible through an automat;
- stations for which the amount to be paid is rather low, mainly in 'opened' toll system where a fixed amount has to be paid for a given section whatever the entrance and exit point on the network, and where even a minor error in the estimate of the corresponding low rate of return to the credit card may generate important gaps as compared with the effective traffic, all the more as the behavioral logic of the choice of the mode of payment might differ of the one prevailing in 'closed' toll systems depending on the entrance and exit stations because of the addition for a long distance trip of several tolls of low amount partly comparable to a single payment having for value the sum of these successive tolls.

At present, these types of gaps are only corrected on a singular basis. It would certainly be appropriate in the future to produce a typology of stations to this respect, results concerning types differing from the average behavior being corrected ex post according to a procedure to be defined.

**Analysis of the gaps by toll station and by day between estimated flows and traffic for class 1 all nationalities together**

Exit station	Exit day dd/mm/yyyy	Traffic	Traffic after correction (1)	Estim. Flow (2)	(2)-(1)	(2)-(1)/(1)
AMBERIEU	01/07/2002	3003	2 998	3 151	153	5
AUXERRE NORD	01/07/2002	2074	2 071	2 251	180	9
AUXERRE SUD	01/07/2002	1188	1 186	1 272	86	7
.....						
VULAINES	31/08/2002	488	487	533	46	9

Once all motorway networks have been treated that way, before adopting the final version of the estimations, a very last test of coherence between networks is processed. The opportunity for it is the fact that some of the networks are interlinked, in the sense that the payment is due not at the exit of the first network used but at the exit of the second network: this means that for a given O/D, the estimate of the traffic will be based on the data of a different network according to the direction of traffic. Based on the assumption of a symmetry of flows in each direction provided the period considered is long enough, there should therefore be no major gap between the estimates of the two directions of traffic, *as illustrated in the validation table below* relative to the flows between Reims and Lyons conurbations (good overall coherence between « way in » from APRR and « way back » from SANEF, in spite of strong imbalances within each month revealing the seasonality of flows considered separately).

**An ultimate possibility of validation, the cross-checking of estimates according to the network providing the data for an O/D split between two networks :  
the example of Taissy / Villefranche-Limas**

COUNTRY CODE	TAISSY / VILLEFRANCHE-LIMAS (SAPRR)			VILLEFRANCHE-LIMAS / TAISSY (SANEF)		
	JULY	AUGUST	Total	JULY	AUGUST	Total
AUT	8	12	21	7	3	10
BEL	18 952	8 567	27 520	13 550	15 337	28 887
CHE	41	29	70	25	38	64
CZE	7	4	11	0	0	0
DEU	72	69	141	72	55	127
DNK	27	12	40	48	22	69
ESP	315	556	871	285	388	673
GBR	7 823	7 538	15 361	3 372	9 210	12 582
ITA	321	630	952	418	488	906
LUX	45	29	74	41	57	98
NLD	3 098	842	3 940	1 910	2 842	4 753
NOR	13		13	24	12	37
POL	-	-	-	4	7	11
PRT	2	12	13	2	2	4
SWE	27	7	34	42	14	55
<b>TOTAL</b>	<b>30 752</b>	<b>18 307</b>	<b>49 059</b>	<b>19 800</b>	<b>28 477</b>	<b>48 276</b>

At the end of this overall process, it becomes possible to add to the original file provided by motorway companies the estimate of the total number of vehicles corresponding for each line of the file to the number of transactions by credit card (*see figure below*) for each of the 17 nationalities estimated.

### Format of the result file

Toll Class	Entrance Station (Code)	Exit Gare Station (Code)	Entrance Toll Station (Name)	Exit Toll Station (Name)	O/D direction	Country Code	Transaction Number	Exit Day	Total Price	Estim. Flow
1	05004	09079	ALLAINES	CLERMONT-BARRIERE	Ex.	ITA	4	24-Aug-01	90.84	29
2	05004	09079	ALLAINES	CLERMONT-BARRIERE	Ex.	ITA	1	24-Aug-02	31.5	6
1	05004	09079	ALLAINES	CLERMONT-BARRIERE	Ex.	LUX	1	10-Apr-01	90.84	2
1	05004	09079	ALLAINES	CLERMONT-BARRIERE	Ex.	LUX	1	29-Jul-01	90.84	2
1	09112	09101	« Open » Toll System	MYENNES	En.	ESP	1	11-Oct-01	13,72	2
1	09112	09101	POUILLY-EN-AUXOIS	FLEURY-EN-BIERE	Ex.	CHE	2	08-Dec-01	27.44	11
1	09112	09101	POUILLY-EN-AUXOIS	FLEURY-EN-BIERE	Ex.	DNK	1	11-Apr-02	13,9	6
1	09112	09101	POUILLY-EN-AUXOIS	FLEURY-EN-BIERE	Ex.	DNK	1	21-May-02	13,9	6

All these nationalities are European, so that the reasons for divergence between the nationality of the registration of the car, of the bank of payment and of the visitors, although possible, are very limited as compared with tourists from other continents that may rent a car in the country where is located their airport of arrival. The results of the counts show also that the proportion of non tourist vehicles, especially in toll class 2, is for foreign nationalities most often very low, so that the possible overestimation of international tourism motorway flows by this method is very limited. As for most of the selected European nationalities the car is the dominant mode of access of tourists to France, and as they concentrate more than 99% of all the foreign customers of the motorway companies from the counts processed whatever the network, the relevance of the estimates is quite high.

### Main types of results

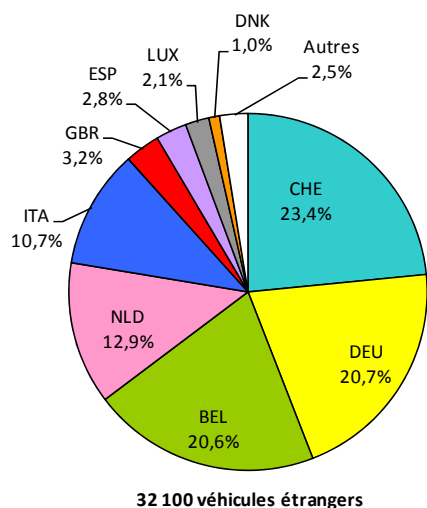
This data base can be used in many different perspectives according to the specific interest of local customers, either institutional (Committees for Tourism at municipal, county or regional level) or professional (hotel chains for instance). Some of the major types of results that can be derived from the data are presented in the following pages.

A classical representation gives the split by nationality of visits of a specific tourist location over a whole year, such as at Manosque in Provence. It usually shows a concentration of campers on a more limited number of nationalities. It can also be compared with the volume and structure of the total flow on the network, often resulting in a higher propensity to visit for travellers from far away, and giving indications on the potential market by nationality.

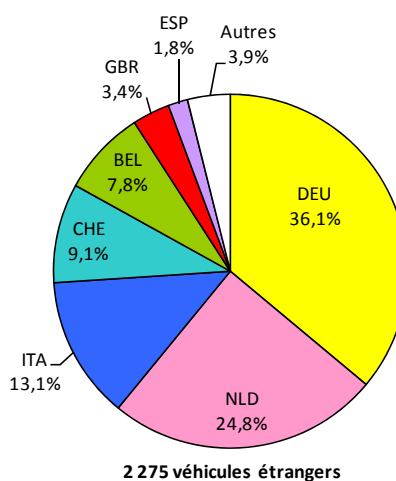
## Provence-Alpes-Côte d'Azur Toll station : Manosque

### Exits of foreign vehicles at the toll station year 2005

Classes 1+2



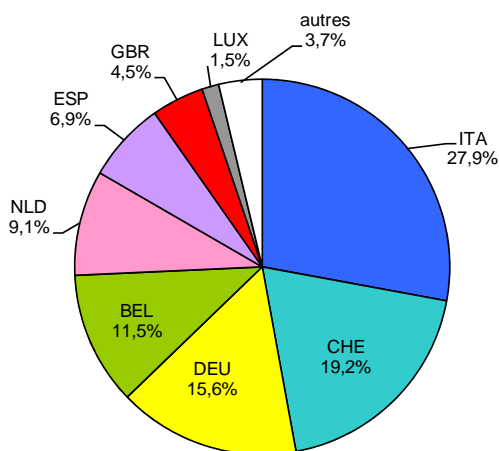
Classe 2



### Flows on the network sections before reaching the toll station – year 2005 – classes 1+2

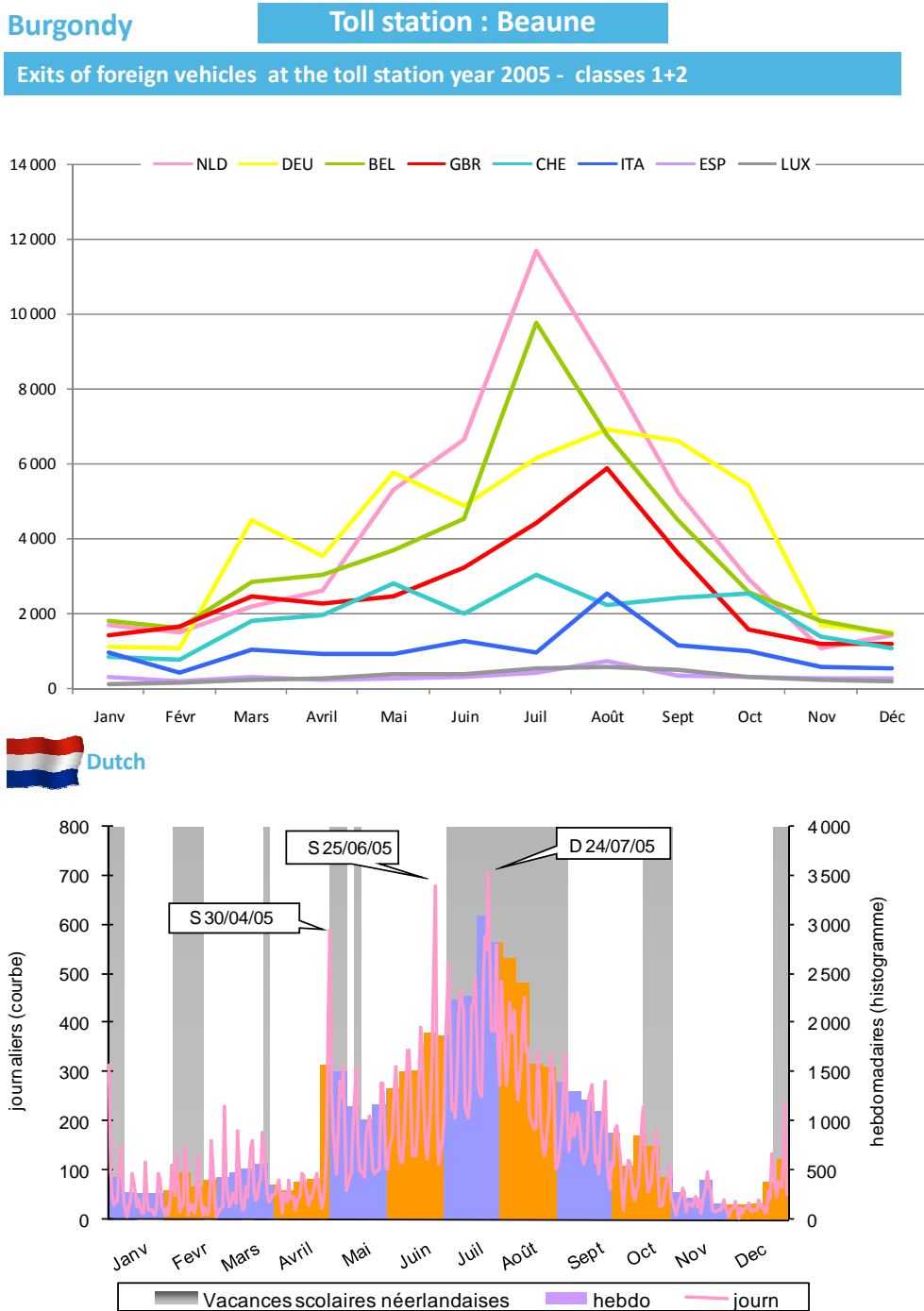
Classes 1+2

Annual traffic :  
374 490 vehicles



La Brillanne/Manosque et St Paul Les  
Durance/Manosque

The information can also be used to point out the differences of monthly seasonality profile among the nationalities, opposing in the case of Beaune sharp peaks like for the Dutch in July to visits better spread over time like for Germans. I can also at a daily/weekly scale evidence the strong correlation between the school vacation calendar and the peaks of visit, like in the case of Dutch in the example below.

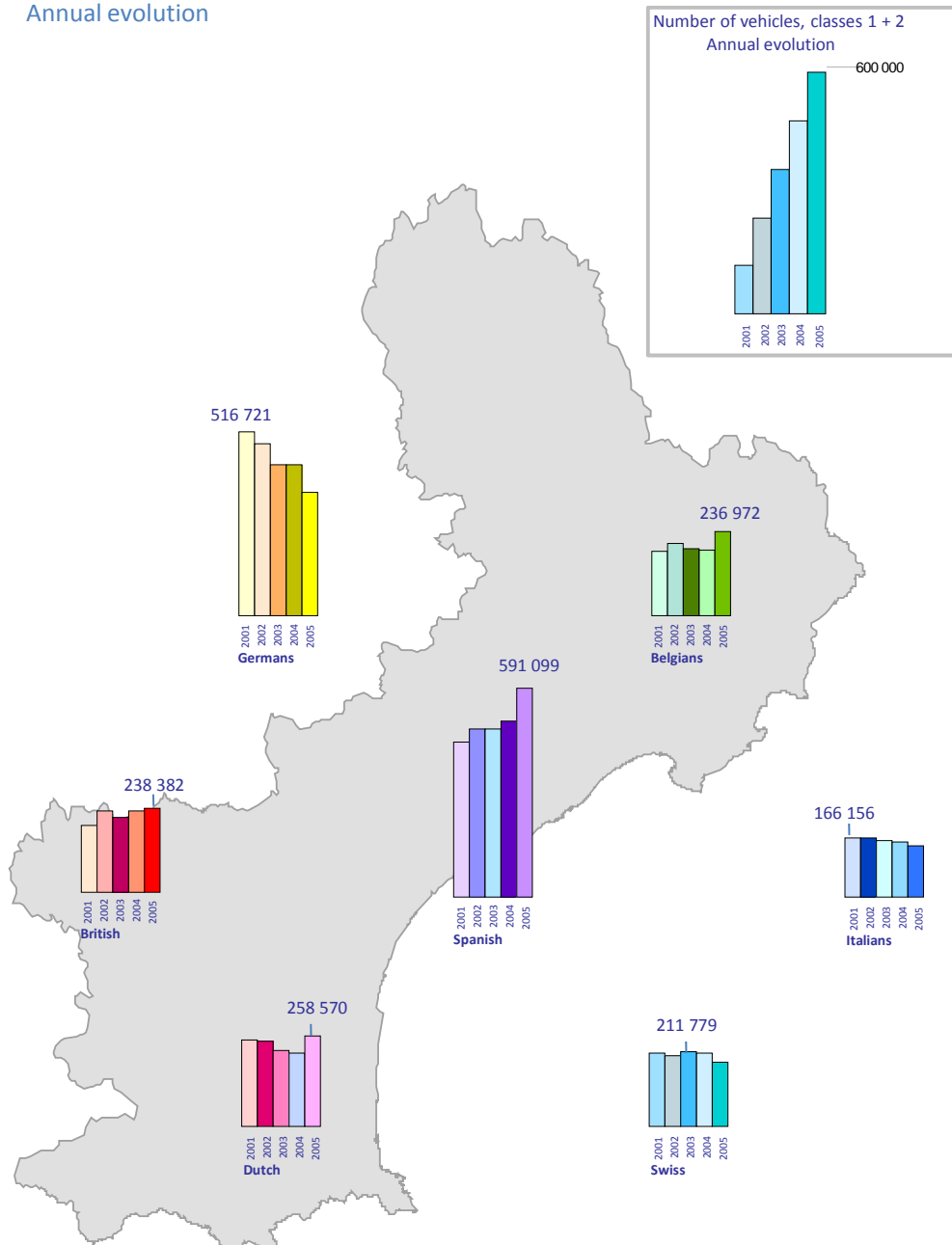


When the cooperation is ancient like with the ASF network, it is possible to analyze visit trends according to the nationality, resulting in the case of Languedoc-Roussillon in strong annual growths for Spanish, heavy decreases for German and more stable trends for other nationalities.

## Languedoc-Roussillon

### Regional visits with acces by motorway\*

Annual evolution



\* Exits on all stations giving access to the territories –reference year 2005

Using the information at toll barriers along the networks at peak periods of visit of France, it is possible to identify the main routes followed and to observe how the traffic decreases progressively from the entrance gateways up to border points of exit from the French territory, revealing in the case of Germans in summer a high proportion of transit towards Spain.



## Germans

### Routes followed on motorway network

On 29 and 30 July 2005 \*

Number of vehicles, classes 1+2



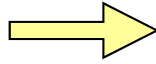
8 800



Itinéraires principaux



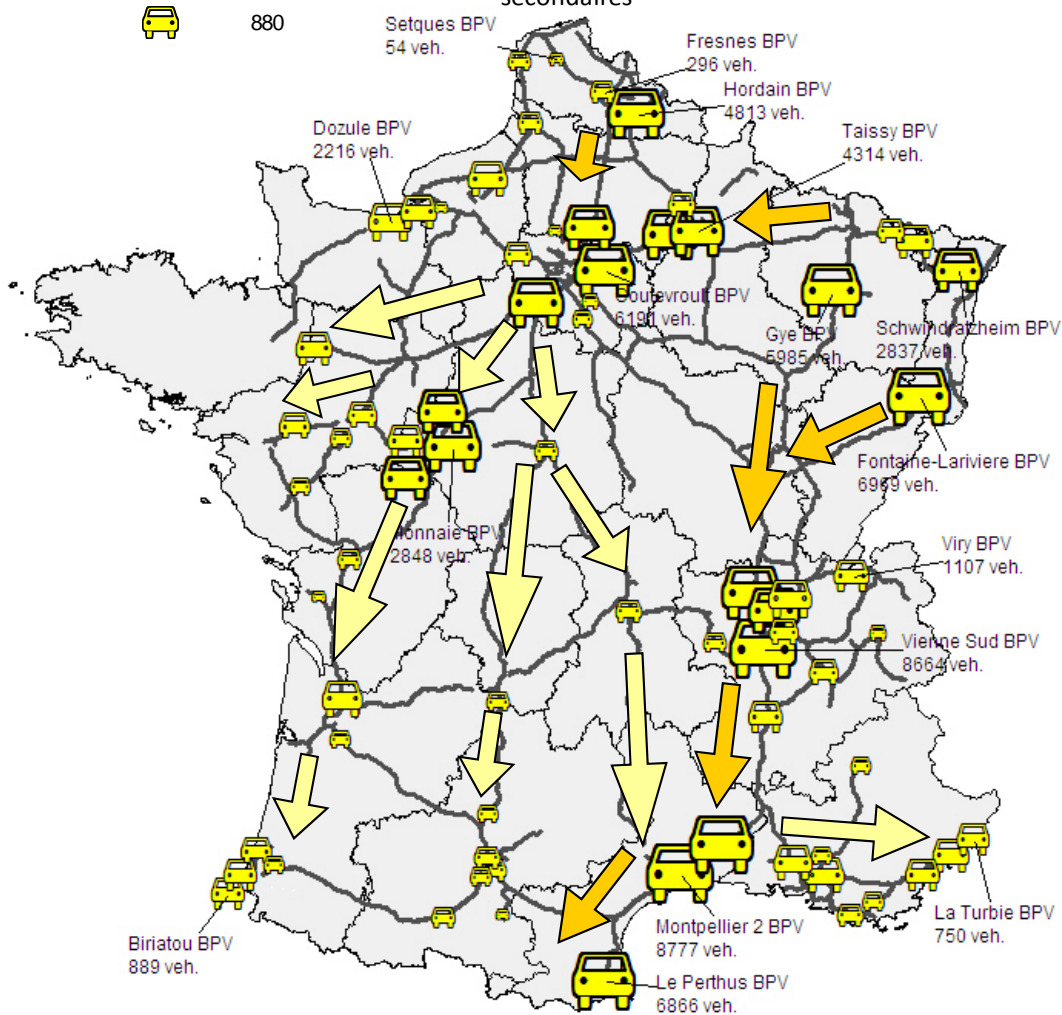
4 400



Itinéraires secondaires



880



\* Reference year 2005 ( equivalent days in 2004 for AREA network)

Thanks to the merging of estimates from all cooperating networks, it is possible to produce a global picture of the visits for each toll station serving the French territory, in terms of volume as well as in terms of proportion of the total foreign visits. In the case of British it shows a rather widespread dispersion, in spite of some domination of the western areas.

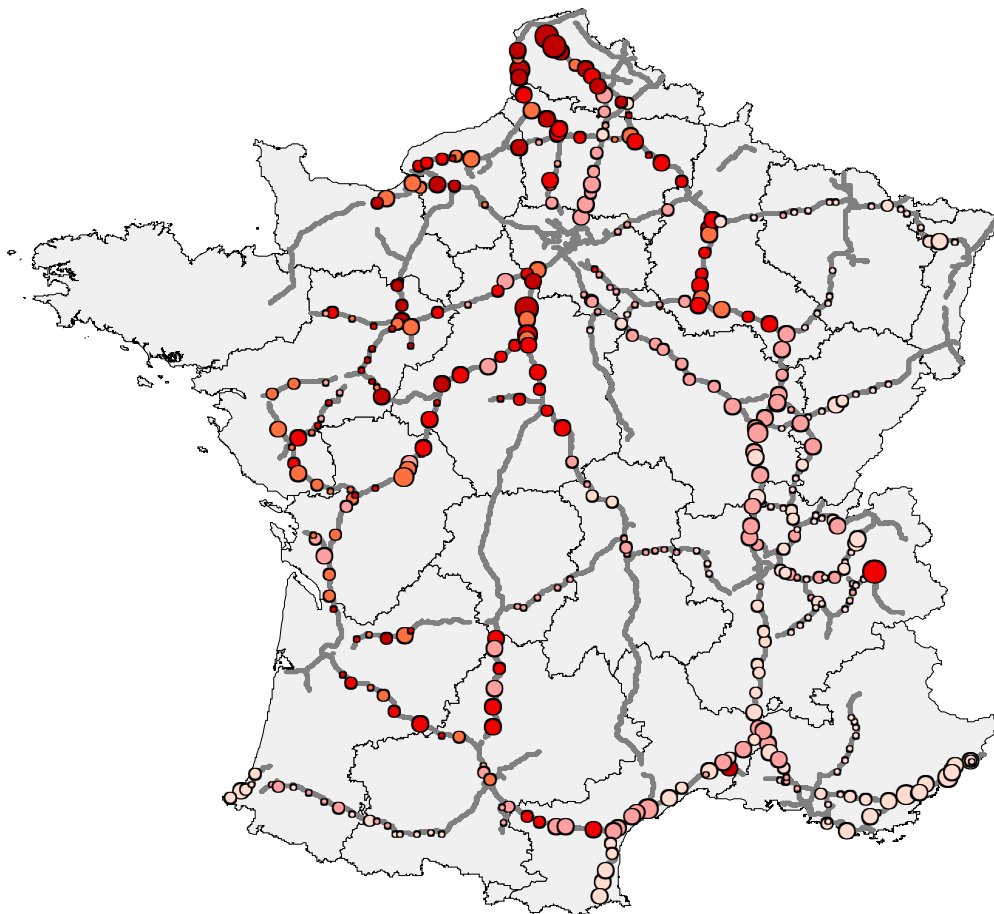


Visits in 2005 \*

Véhicules de classes 1 + 2

- In proportion of the total European visits \*\*
- In terms of volume of exits (number of vehicles)

En % du total des 17 nationalités	En vol. des sorties cl 1+2
● > 40% (27)	○ 40 000 - 73 000 (4)
● 30% - 40% (44)	○ 20 000 - 40 000 (7)
● 20% - 30% (73)	○ 5 000 - 20 000 (116)
● 10% - 20% (119)	◇ 2 000 - 5 000 (116)
● 0% - 10% (142)	• 0 - 2 000 (162)



\* Exits on all stations giving access to the territories –reference year 2005 (2004 for stations of AREA network)

\*\* for the 17 countries for which an estimate is produced

## **Further perspectives**

Among the multiple perspectives of further evolution of the application, we would like to make a particular mention of the following ones:

- extending the cooperation to the motorway networks or other toll infrastructure not cooperating yet, in order to reach a full coverage of the French territory;
- modulating in the future the estimates according to the type of toll barrier by introducing an additional correlation with the structure of the toll supply (split between automatic and manual lanes in relation with the density of traffic as likely to influence the behaviour of choice of the mode of payment);
- adapting accordingly the estimation process, possibly by estimating correlations distinctly by classes of a typology of stations based on the nature of the toll supply, all motorway networks together;
- tracing the individual payments within a given network in order to reconstitute the stage from the entrance up to the exit of this network, when it is divided in several successive 'closed' sections (with payment according to the O/D and toll barriers at the extremities of each section) or when the toll system is 'opened' (successive payments along the network independently from the access and egress points), which prevents from identifying directly the origin/destination on the motorway network and in the second case the area of visit ;
- tracing the individual payments along contiguous networks in the respect of the confidentiality of the data with a specific help of motorway companies, to extend this reconstitution to the whole stage from the first entrance on the French motorway network up to the last exit;
- estimating national aggregates by elimination of double counts, taking advantage of the two previous improvements;
- improving the estimations in number of tourists on the basis of the estimates of number of vehicles;
- strengthening the estimates of the local presence of foreign visitors by comparison with other data sources, such as the national survey about hotel and camping customers or the taxation files about ownership by foreigners of holiday homes.