

August 2003

## **Munich's Public Passenger Transport System<sup>1</sup> Framing Legislation/Regulation and Planning Goals**

### **LEGISLATION AND REGULATIONS**

In 1993 a far-reaching structural reform to the rail system's organization brought some significant changes of the public passengers transport (public passengers transport):

- the regionalization of the rail's public passengers transport, i.e. a transfer of responsibilities from the federal level to the states, by the Regionalization Act (Regionalisierungsgesetz),
- an amendment of the General Railway Act (Allgemeines Eisenbahngesetz, AEG),
- an amendment of the Passengers Transportation Act (Personenbeförderungsgesetz, PbefG),
- the states' authorization to issue their own Regional/Local Transportation Laws, e.g. the Bavarian Public Passengers Transportation Act (Bayerisches Öffentliches Personennahverkehrsgesetz, BayÖPNVG).

Also, European Law exerts more and more influence on domestic matters, especially on increased competition (see below).

Funding of public passengers transport is regulated by different laws, namely the above mentioned Regionalization Act, the Municipalities Transportation Financing Act (Gemeindefinanzierungsgesetz, GVFG), the Revenue Sharing Act (Finanzausgleichsgesetz, FAG), the above mentioned BAVARIAN PUBLIC PASSENGERS TRANSPORT Act and the Federal Railways Extension Act (Bundesschienenwegeausbaugesetz, BSchWG).

### **REGIONAL TRANSPORTATION PLAN**

According to the Bavarian Public Passengers Transportation Act a regional transportation plan (RTP) must be drawn up if significant traffic relations exist among a number of municipalities. This is no question in an agglomeration like Munich with its daily about 1 million trips of public transport passengers and cars (both directions), respectively, between the city of Munich and its surrounding conurbation as well as its more than 350000 cross-border public transport trips among the municipalities of the conurbation (trips originate and end within the MVV-area of activity, see below).

Munich's Cooperation on Transport and Tariffs, society of limited liability (Münchner Verkehrs- und Tarifverbund GmbH, MVV) is entrusted with the drawing of the RTP within its area of activity. The RTP as a non-binding guideline shows the connections and interfaces between the different existing Local Transportation Plans (LTPs) and comments on the regional traffic's situation. Similar to LTPs its contents are:

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<sup>1</sup> Working paper written in connection with the cooperation Munich-Stockholm

- stocktaking and weakness-analysis of transport facilities,
- forecast of traffic volumes,
- compilation of planned projects and measures,
- objectives' and improvement proposals of an optimal organization and operation of public passengers transport.

Rail public passengers transport is communicated only message-like.

The cooperation's member assembly (see below) took notice of the recent version (Nov. 2002) which is to be reviewed after 5 years.

### **CITY OF MUNICH'S LOCAL TRANSPORTATION PLAN**

On the basis of a several-times- reviewed "integrated public passenger transportation plan" the city's local transportation plan (LTP) contains all procedural steps towards public passengers transport's extension. The prospective LTP – so far it is limited in its contents to rail-bound modes of traffic – will encompass also minimum requirements and service quality standards for buses.

Along with its resolution on the city development concept "Perspective Munich," the city council commissioned the planning department to work on a new "Integrated transport development plan" (ITDP) the draft of which was publicly discussed in the years 1999/2000. Because of their interdependencies RTP, LTP and ITDP shall be coordinated toward consistency.

### **LOCAL TRANSPORTATION PLANS OF THE COUNTIES**

Responsible for public passengers transport on their territory the counties either have got a LTP, commissioned one or taken the respective actual schedule (timetable) as LTP.

In the following operating and performance figures on road-bound services of the counties belonging to the MVV's area of activity are listed:

- 3 municipal (the cities of Dachau, Freising and Wolfratshausen act as licensed transport companies) and 53 private transport companies operate the counties' services, i.e.
- 56 companies operate 197 regional bus-routes with a stock of 445 buses and four taxis;
- with a length of lines of about 3600 km the 445 buses amass 18,48 million utilized coach-kilometres per year;
- at 2509 regional bus stops 24,34 million passengers get on the buses;
- along 12 light-rail (S-) routes passengers can change to or from regional buses at 78 stations, along six regional (German rail) train routes at seven train stations.

## **SPATIAL MANAGEMENT: PROGRAMS, PLANS AND PLANNING GOALS**

Programs and plans of significance to the public passengers transport system are the Bavarian state development program and the regional plan of Munich.

Without listing the lot of principles and goals laid down in these works – addressing in large parts concrete connections and measures of expansion regarding long-distance train, light rail, subway, tram and buses – the most prominent general principles with regard to public passengers transport are the following:

### State Development Program

Basically, spatial management shall help to minimize transport needs and shall, otherwise, be orientated towards rail access as well as efficient public transport connections. The greatest possible share of the increasing traffic volumes shall be shifted to public transport carriers.

Especially an effective and attractive, preferably to be extended local passenger transport system shall respond to the mass-traffic volumes of the agglomerations (Verdichtungsräume). In its more urbanized and densely built areas, the city and its closer conurbation (Stadt- und Umlandbereich), traffic conditions shall be improved by means of avoiding transport needs, of traffic calming and of meeting demand environmentally-friendly through local passenger transport and non-motorized private transport.

In the state's rural parts (as there are as well some in the Munich region) the local public passengers transport system shall be maintained and – using specific traffic carriers – expanded towards an alternative to motorized private transport.

### Regional Plan

Road safety shall be augmented above all in favour of pedestrians and cyclists.

In the region's more urbanized and densely built areas as well as in middle centers public passengers transport shall be given preference to motorized private transport, i.e. the share of the latter shall be reduced and the share of the first increased, compared to the total traffic volume.

The region's monocentric radial transport system shall be supplemented by an extension of tangential public passengers transport lines.

## **ORGANIZATION AND STRUCTURE OF THE PUBLIC TRANSPORT NETWORK**

### Responsibilities

In Germany the responsibilities for public passengers transport are decentralized. They are devolved on the administrative levels of government: the state (long-distance service and light rail /S-Bahn), the counties (sub-regional service, esp. buses), and major cities like Munich (for their city transportation system of subways/U-Bahn, trams/ Strassenbahn and buses). Smaller city-like municipalities may operate a city bus on their own., The decentralized governments of the Munich region are – with the exception of one county (Landsberg), but with part of an adjoining out-of-region county to the south (Bad Tölz-Wolfratshausen) - in a cooperation (Münchner 'Verkehrs- und Tarifverbund, MVV), the Munich Cooperation on Transport and Tariffs. Thus, the formation of the cooperation has resulted in a re-centralization of some of the responsibilities, although the actual decisions are still made by the governmental administrations and their parliaments.

### Munich's Cooperation on Transport and Tariffs

The (MVV) was in 1972. It employs 75 people and serves an area of 5,500 km<sup>2</sup> (MVV-area of activity) of which 310 km<sup>2</sup> are taken by the City of Munich.

Members of the MVV are: the City of Munich, the State of Bavaria and 8 counties. Remaining the de facto responsible of the public passenger transport system they have concrete contractor-relationships with the public transport operators/companies. MVV is a kind of intermediary between the governmental authorities and the operators (see diagram of appendix 1). All 10 authorities are represented by one delegate in the cooperation's assembly ('Gesellschafterversammlung'). MVV and the public transport operators first present their views in the cooperation's council ('Verbundrat', without decision-making power). This council submits its proposals to the assembly for final decision.

### Public Transport Operators

Approximately 50 public transport operators are active in the MVV area. Public Works and Utility Munich (Stadtwerke München, (SWM) with its subsidiary Munich's Transport Company (MVG) and German Rail (Deutsche Bahn, DB) (DB) are the largest of those operating the city's transportation system in Munich and the regional light rail system (S-Bahn), respectively. An important major bus operator for regional transportation is Regional Transport Upper Bavaria (Regionalverkehr Oberbayern). This is a subsidiary of German Rail and was initially established to replace very unprofitable train services. The remaining regional operators are mainly small, private businesses, active only in the counties.

### Structure of the Public Transport Network

The Munich region is a non-centered agglomeration. Rail access shows a radial pattern, tangential links in the city's surrounding area are missing.

In the MVV area bus, tram, subway and regional light rail services are offered. Both the rapid transit system (S-Bahn) and the subway system (U-Bahn) have each 8 lines, the first one with a radius of 35 to 40 km (see map of appendix 2). The tram has 10 lines; it has few dedicated tracks but enjoys – like several bus lines – more and more priority at intersections thus improving continually its average velocity. There is also a dense network of bus lines.

## **TRANSPORTATION AND TRAFFIC POLICY**

### Competition

Competition by public tender invitations is mandated in Germany since 1996. The act states that tendering is compulsory for either transport services as a cooperative economy ('gemeinwirtschaftliche Verkehrsleistungen') or transportation in the service of the national economy. This term is however difficult to define in practice. For this reason tendering continues to be employed only on a restricted scale in favour of longstanding established relations with the public transport operators. MVGSWM, for one, receives to this day a cross-subsidizing contribution from the energy sector of SWM (see also 7.4) reasoning that it is operating not for the national but for the city's autonomous transport economy (eigenwirtschaftliche Verkehre) only.

Some counties in the state of Bavaria do tender the regional transportation services. This amounts, however, by number of passengers to only 3% of the total transportation market.

Most counties of the MVV-area and the City of Munich – the latter in its double role as owner of the city's transport company and as responsible of public passengers transport - do not yet tender.

In September of (\_\_\_\_) a compromise was struck between the Bavarian State Ministry of Economy, Transport and Technology, the local governments and the operators stipulating that new contracts provide for a decline in costs. Otherwise the operation would be put to tender. So far these contracts, that in fact result from the pressure of imminent competition, have entailed annual costs being about 1% to 9% less than before.

Though there still is only small-scale competition in the MVV-area there are, however, incentives to reduce costs. To improve quality. MVV has, in recognition of the increased competition since 1996, introduced a penalty system. To this end customers are surveyed and complaints registered. Penalties can be as high as €5000., but in practice only low penalties are imposed. Bonuses for good quality are not yet awarded, but that is the intention for the future.

#### Integrated Traffic and Transportation Policy

The various decentralized governments are also responsible for the peripheral policy aim of optimizing the modal split, each at its own operating level and within its geographical boundaries. MVV has no responsibilities in this field, but does try to exercise influence. The general aim of governments is to realize a modal split improvement in favour of public transport regardless of a possible reduction in the public transport subsidies. To achieve such an improvement the price-quality ratio of the public transport system is an important resource in combination with additional peripheral measures. Part of Munich's city center, e.g. , is reserved for pedestrians only. Parking is very expensive there, priced €2,50 per hour. Beyond the city center, in areas of dense parking, the price is even higher. Moreover, MVV is investing in P&R facilities at the S-bahn stations. Passengers with a public transport ticket may park free of charge there and, indeed, they are content with this concept, though, in their opinion, there are still far too few parking spaces. Consequently, circa 11,200 additional spaces are planned to add to the existing 20,100.

In recent years the public transport network within MVV has been expanded and new rolling stock been bought.

A marketing program is being operated to provide consistency and intelligible customer information. Beside MVG – the largest municipal public transport operator – passengers widely notice 'Cooperative Verbund-marketing' and travel mostly in their perception with MVV as operator.

#### **POLICY AND STRUCTURE OF FARES**

Ticket and fare integration was one of the reasons for establishing the MVV in 1972. MVV and the public transport operators negotiate a fares- structure proposal which is submitted to the cooperation's assembly (of MVV) for final approval.

### Zones based Pricing Model, Ticket Categories and Fares

Munich has a system of individual (Bartarif) and of seasonal ticketing (Zeitkartentarif).

For a long time passengers were confused particularly with regard to seasonal tickets: customer contentedness-surveys indicated the zone structure as being too complex. Originally, there were 141 zones and for each market segment a special seasonal ticket. In 1999 this ticket and fares structure was thoroughly revised. The restructuring was also aimed at improving the cost cover level, the planned reduction of fares being expected to be balanced out by new passengers attracted to public transport.

In the new system for seasonal tickets the number of zones was reduced from 141 zone segments (with 16 covering the city of Munich) to 16 rings/zones (of which the city of Munich now covers 4). A drawback of the limited number of zones in this system, specifically a sharp price increase for seasonal ticket holders crossing that a zone-boundary at a one-stop journey was amended by introducing additional rings within the zones. Customer contentedness surveys demonstrate that the clarity of the new system is appreciated.

Also, the number of ticket categories was reduced (and hence) simplified. The ticket categories offered today are:

- A single ticket for public transport in the city center costs €1.00. For one zone (outside the city center) the price is €2.00.
- A ticket for one day's worth of public transport costs €4.50 for one person.
- A maximum of 5 persons may travel together for €8.00 with the so-called Partner-Tageskarte.
- A stripe-ticket ('Streifenkarte') with ten stripes for €9.00 is sold over the counter or from the vending machines. This card was destined to be out-phased with the fares revision, but eventually kept because of its high passenger esteem.

Seasonal tickets both personal and – since 1999 – also identically priced transferable ones exist in the MVV area. Contrary to expectations there was no run towards these latter ones because in the event of a loss someone else can use the transferable ticket. Similar experiences were made in Frankfurt: 80% of the passengers using personal seasonal tickets before stuck to this type after the introduction of a transferable one.

MVV has also arrangements with a variety of parties such as theatres, the opera house, Munich's Trade Fare center and the like in which the price of transportation is included in the admission tickets. Similar 'Tarifkooperationen' are also concluded for single events.

All tickets (including seasonal tickets) can be bought from vending machines. Though a comfortable improvement for the passengers the increased use of the ticket vending machines is depriving kiosks of their income. At present 39% of all tickets are bought at the kiosks. They are licensed and receive commission on the sale of tickets as long as revenues do not drop below a minimum amount.

### Target Groups for Rebates

Throughout all of Germany target groups are distinguished, all of which receive rebates of some kind on public transport – so in Munich as well:

Children (6-14 years) are supposed to be fully paying future public transport customers and are charged €0.95 (instead of €1.00) for a single journey and €1.80 (instead of €4.50) for a day's ticket. Children below the age of 6 years are free of charge.

There are also special school tickets (“Ausbildungskarte I”) for children of age 6 to 15 who live more than 3 km away from school; 90% of this age-group take advantage of this offer.

Handicapped: pays €60.00 per annum to their residential authority (municipality or county) and travel otherwise free of charge within a radius of 50 km from their home. The public transport operators are compensated for this rebate by 4.33% of the total ticket income.

Seniors (women: 60+ and men: 65+) are free to use the Senior Card which allows travel in the off-peak hours and during weekends with a wide range of discounts. For the funding of this senior card MVV receives no contributions from the or the federal government. It is all but a commercial initiative to ensure a better utilisation of the public passenger transport system during the off-peak hours.

In the counties of the MVV area there can also be found the collecting taxi by call (‘Anrufsammeltaxi’), a form of demand-dependent transportation. The price of a ticket is between € 1,002 to 2,50 and is not integrated into the ‘MVV-Tariff’. An MVV seasonal ticket, though, qualifies for a rebate of 0,50 cents when using a taxi. Since this offer does not cover its costs the counties make a supplementing contribution. Most of these projects are still in the experimental phase. MVV aims, in the medium-term, to integrate demand-dependent transportation into the MVV fares structure.

### Smart Card

The intention is to introduce a smart card in the MVV region, but as of yet this initiative is not receiving full efforts. A lot of supplementing infrastructure would be needed and MVV would have to shoulder the costs. The preference is for a contact-free card, something like the Easyride in Switzerland. At present 70% of all passengers are seasonal ticket holders and the contact-free smart card would mean to them a retrograde step, involving many more procedures. There are still a lot of open questions, e.g., what would happen in the case of aif the system-failure and how to deal with fraud? MVV estimates that an introduction of a smart-card will take at least another three years.

## **FUNDING**

In the large majority of cases a fixed annual amount is negotiated that the public transport operators are entitled to receive and that is based on the predicted total costs. In the event of the actual costs being less than estimated beforehand the difference is for the operator.

### Offering Price Method

For contracts with the few operators of regional bus services resulting from open competition the offering-price method ('Angebotspreis-Methodik') applies. These operators have via MVV a contract with the governments, MVV functions, here again, as an intermediary. The operator principals are responsible for their revenues; MVV runs bears no financial risk. The public transport operators offer in their 'quotation'/cost estimate a price per vehicle-kilometre, the so-called "Angebotspreis". This price is equal to 100% of the costs on the basis of the vehicle-kilometres actually planned to be travelled. In the contract MVV ties the operators to the operating terms and conditions.. Balancing settlement is made later, the costs incurred being covered on the basis of the 'Angebotspreis' agreed on and the vehicle-kilometres realized. German Rail (DB) operates just like the regional transport operators for the lines tendered with the 'Angebotspreis' though on the basis of train-kilometres. Here, the state government is responsible for revenues.

By this method of subsidies based on estimated costs the public transport operators have an incentive to keep costs down though the revenues' risk remains with the responsible governments.

### Sources of Funding Public Passenger Transport

The subsidies for the public transport operators are paid by the governmental authorities from local taxes. For Public Works and Utility Munich (SWM/MVG) and German Rail (DB) this means that deficits are covered by the City of Munich and the state governments, respectively.

When it comes to the operation of German Rail's regional train transport traffic the state government receives allocations (so-called "Regionalisierungsmittel") from the federal government. This money is actually raised from the transport sector as a gas tax ("Mineralölsteuer") collected via the value added tax system. The Ministry of Finance calculates the amounts to be assigned to the state governments,. In 1997, e.g., a total of €6 billion of which Bavaria received €0,65 billion. This amount is annually adapted to the growth of the value added tax.

Moreover, The various associations of public transport ('Verkehrsverbände') receive contributions from the federal government to cover their operating costs.

Also, some state governments provide additional grants for operation. Bavaria for one pays some €62 million per year to this end.

### Distribution of Revenues

Revenues being realized from the public transport systems are distributed by a special consistent method to the operators which are partners of the tariff-cooperation. That method is laid down in a contract regulating the distribution of revenues. MVV is entrusted with the execution of the distribution of revenues. In a first step the revenues remain with the respective transportation companies. They convey, though, each month their revenues to the MVV which, on its part, allocates the conveyed total revenues arithmatically to the respective transportation companies. The share of revenues allocated to the regional bus-services in the 8 counties is determined by a special demand-related procedure. Its basis is a passenger-interview that usually takes place every third year on two workdays, one Saturday and one Sunday.

The remaining revenues (after deduction of those parts allocated to the regional bus-services) to which the two big transport companies DB and MVG are entitled to are contractually distributed by percentage. Differences between cash-account revenues of the respective two companies and revenues that can be claimed by contract and are calculated by MVV are balanced through a clearance agreement.

Currently, a new contract regulating the distribution of revenues is being negotiated among the MVV partners.

### **RESULTS, FACTS AND FIGURES**

Although the light-rail's length of tracks is fivefold the subway's length, the latter transports by a margin of about 26% more passengers. Tram and city buses together exceed slightly the light-rail's number of passengers. By passenger-kilometres, though, light-rail stands out from all other modes of transport, its relation to the subway, e.g., being 2.4:1 (see chart 1 of appendix 3).

Compared by train-/coach-kilometres the relation between light-rail and subway (2.0:1) is quite similar to the one of passenger-kilometres but now the city and even regional buses' coach-kilometres exceed the one of light-rail, with regard to the city buses even significantly (see chart 2 of appendix 3).

The number of passengers in 2001 amounted to 561 million throughout the entire MVV-area which is equal to 1.7 million per day). In recent years there has been a further light increase in public transport passengers due to the expansions of the public transport network. The S-Bahn, for example, was connected to the airport, the area limits of tariff integration on some lines were extended and new rolling stock been bought for the light-rail, subway, bus and tram systems (see chart 3 of appendix 3).

These by and large good results of public passengers transport. are worth mentioning because the equipment with cars is since decades steadily on a rise – merely in the city of Munich it came to a turning point since 2000 – showing its highest results surprisingly in the two counties Munich and Starnberg with their comparatively best public passengers transport. accessibility ( see chart 4 of appendix 3).

As expected the share of public passengers transport. – measured by personal trips per workingday, without walking and bicycling – is highest with the inner-city traffic (48%), followed by the city limits crossing conurbation traffic (33%). With tangential rail tracks missing in the conurbation outside the city small wonder that public passengers transport. just gains 10% (see chart 5 of appendix 3).

Eventually, the overall share between environmentally friendly and motorized transportation of Munich's inner-city traffic is about 72% in favour of walking, bicycling and public passengers transport. (see diagram of appendix).

## APPENDIX

### Diagrams and Charts

#### Passengers and operating efficiency by modes of transport

Year 2000/2001	Length of tracks (in km) <sup>2</sup>		Length of lines (in km)		Passenger-kilometres (in million. km)		Passengers by mode of transport (year/million.)	
	2000	2001	2000	2001	2000	2001	2000	2001
Light-Rail (S)	4430	442,0	517,0	530,0	3104,217	3332,691	231,338	244,425
Subway (U)	850	85,0	137,6	137,6	1313,229	1372,699	293,924	307,230
Tram	712	71,2	98,2	98,2	228,307	239,554	81,093	84,412
City Buses	4097	409,7	574,9	580,7	425,009	437,336	160,213	164,198
Regional Buses	o.A.	o.A.	3655,0	3655,0	178,336	178,336	32,374	32,374
Total	30089	30089	69827	70025	7249098	7561616	2798942	2833639

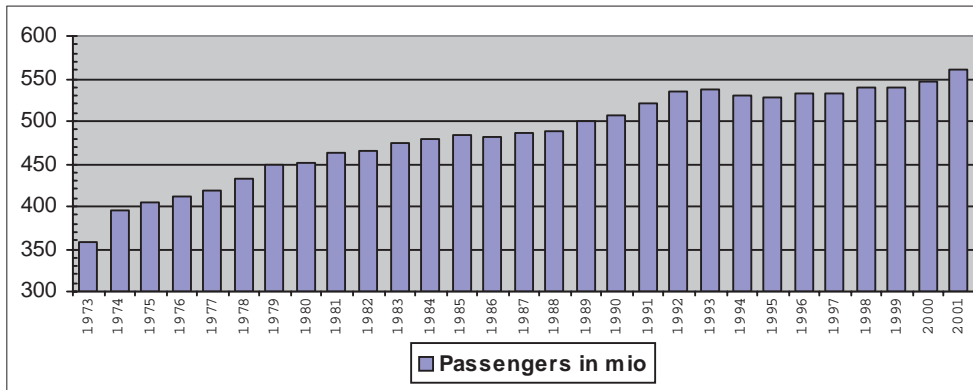
#### Travelled train- and coach-kilometres in MVV-area of activity

Mode of transport	Train-/Coach-kilometres (in million.) <sup>3</sup>	
	2000	2001
Light-Rail (S)	19,080	20,864
Subway (U)	9,969	9,895
Tram	7,169	8,068
City Buses	27,232	27,169
Regional Buses	20,519	21,382

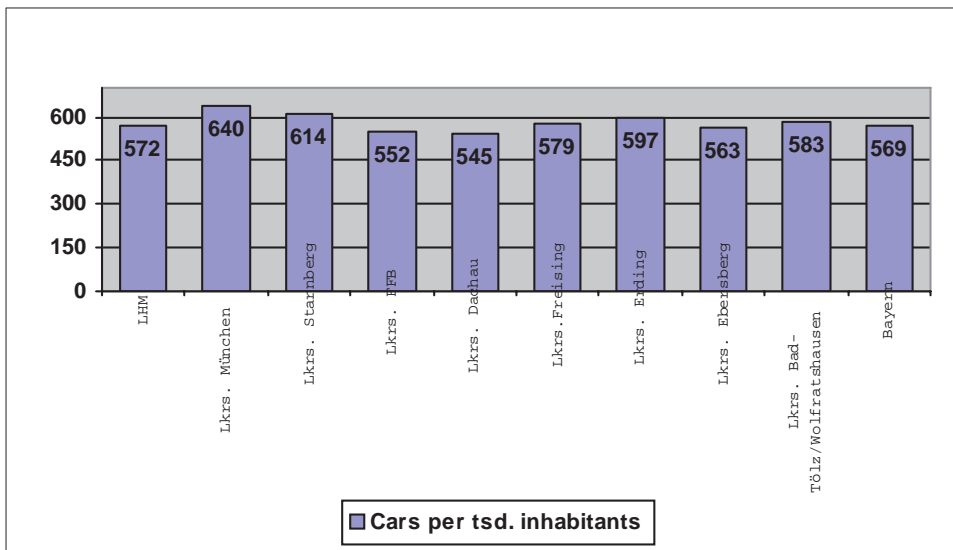
Passengers in MVV-area of activity (using one or more modes of transport per trip)

<sup>2</sup> Calculated according to guidelines of VDV.

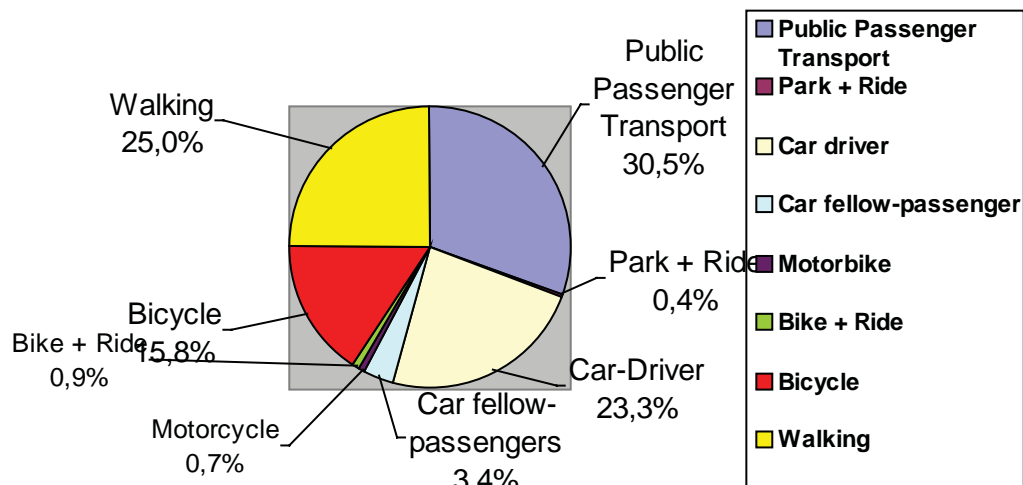
<sup>3</sup> Note: budgeted/targeted (not actual) yield



Car equipment 2001 in MVV-area of activity



Munich's inner-city traffic 2000/2001 - choice of means of transport



Passenger transport demand 2000

Relation	Means of transport	Personal trips per working day absolutely	Share in %
Inner-city traffic of Munich	Public	1.297.700	481
	Private	1.400.100	519
	Total	2.697.800	1000
City limits crossing conurbation traffic	Public	343.1	331
	Private	692.5	669
	Total	1.035.600	1000
Inner-conurbation traffic outside of city	Public	103.7	95
	Private	991	905
	Total	1.094.700	1000
Total inner-traffic of MVV-area	Public	1.744.500	361
	Private	3.083.600	639
	Total	4.828.100	1000