Variable	Unit	Notes	Vienna Case Study	Other Sources
Growth Rates				
The number of residents (row 4)	persons			
The number of workplaces in the service sector (row 5)	workplaces	It should be just an overall estimation. Service sector means approximately commerce.	NACE code (From G to Q) - www.ltck.se/PrjY1/nacekod/nacecode.htm / See pag. 266 in Pfaffenbichler, P., 2003, "The strategic, dynamic and integrated urban land use and transport model MARS (Metropolitan Activity Relocation Simulator).	
The number of workplaces in the production sector (row 6)	workplaces	It should be just an overall estimation. Production means approximately production of non agricultural products.	NACE code (From C to F) - www.ltck.se/PrjY1/nacekod/nacecode.htm / See pag. 265 in Pfaffenbichler, P., 2003, "The strategic, dynamic and integrated urban land use and transport model MARS (Metropolitan Activity Relocation Simulator).	
The car ownership (row 7)	vehicles/1000 residents			
The motorcycle ownership (row 8)	vehicles/1000 residents			
Basic Scalar Data				
The average number of commuting trips per employed residents living in each zone and workday	trips / person and workday	For the Vienna case study is calculated as follows: 365 d/a minus 52 weekends in 261 weekdays/a. 261 weekdays /a minus 5 weeks holidays and minus 13 bank holidays gives 223 workdays per employee and year. 223 workdays per 261 weekdays is 0.85 trips Home - Work per employee and workday.	0,85 commuting trips per employed and workday	
The average daily travel time budget per person (cell B6)	h/person	It includes commuting and non-commuting trips.	69 minutes [Socialdata (1993). Mobilität in Wien; Beiträge zur Stadtforschung, Stadtentwicklung und Stadtgestaltung, Band 45, Wien. p. 12]	Lisbon: 78 minutes [TIS (1993) - Lisbon Metropolitan Area Travel Survey]
The average time span until a household moves out of a domicile (cell B8)	years			
The number of housing units which the developers start to construct in the base year (cell B10)	flats	A housing unit is a household unit, flat or one-family house.		
The average walking speed of pedestrians in the peak period (cell B12)	km/h		6 km/h	
The average walking speed of pedestrians in the off peak period (km/h) (cell B13)	km/h		4 km/h	
Threshold values for the model internal road construction for:				
the percentage change in new developments (cell B15)	percentage	The road capacity is automatically added by the MARS model if the new developments in zone are higher than a threshold value.		
a minimum car speed (cell B16)	km/h	The road capacity is automatically added by the MARS model if the the car speed during the peak period drops below a threshold.		
The occupancy rates of cars and motorcycles for commuting and non working trips (cells B18:C19)	persons/vehicle		1,3 persons/car for commuting trips and 1,5 persons/car for non-working trips [ÖSTAT (1979). Fahrleistungen der Kraftfahrzeuge, Führerscheine - Ergebnisse des Mikrozensus 1977]	
The percentage of employed and residents owning a driving license for cars and motorcycles (cells B21:C22)	percentage			
The fuel consumption of cars and motorcycles (cell B4),	Euro/km	The value to be entered is meant as the petrol price at the pump.		
The parameters for the equation of the speed dependency of the fuel consumption (cells B26:C29),	l/km	Equation: a*fuel + b*fuel*speed private car ij + c*fuel*speed private car ij^2 + d*fuel	Values from a UK source are shown as an example. These values can be used if there are no specific values available (a = 0,1576; b= -0,0028; c= 0,00001933 and d= ---.) [Department for Transport, Transport Analysis Guidance (TAG) (2004) - Values of Time and Operating Costs, TAG Unit 3.5.6 - www.webtag.org.uk]	
The other distance dependent costs of car and motorcycle use (cells B31:C31)	Euro/km	The other distance depend costs are all km-dependent costs (except fuel costs). E.g. lubricants, tyres, servicing etc.		

Variable	Unit	Notes	Vienna Case Study	Other Sources
An estimate of the percentage of these costs which is taken into consideration in the decision process whether to travel by car/motorcycle or not (cells B32:C32)	percentage	Normally people do not consider them in their decisions but they have to be in taken into account in a cost benefit analysis. Therefore it is necessary to define also the share of costs which is perceived by the user.		
Basic Vector Data				
Number of residents (row 5)	persons		See pag. 260 in Pfaffenbichler, P., 2003, "The strategic, dynamic and integrated urban land use and transport model MARS (Metropolitan Activity Relocation Simulator).	Lisbon: www.ine.pt
Number of employed (row 6)	persons	This number should include self employed people as well as informal employees	See pag. 261 in Pfaffenbichler, P., 2003, "The strategic, dynamic and integrated urban land use and transport model MARS (Metropolitan Activity Relocation Simulator).	Lisbon: www.ine.pt
Average household income (Euro/month) (row 7)	Euro/month	The main purpose of household income in MARS is to distinguish between wealthier and poorer spatial divisions. Data for net income per employee were used as an approximation for household income	See pag. 263 in Pfaffenbichler, P., 2003, "The strategic, dynamic and integrated urban land use and transport model MARS (Metropolitan Activity Relocation Simulator).	
Average number of persons living in a household (row 8)	person/flat	Person/flat is equivalent to person/household	See pag. 262 in Pfaffenbichler, P., 2003, "The strategic, dynamic and integrated urban land use and transport model MARS (Metropolitan Activity Relocation Simulator).	Lisbon: www.ine.pt
Average monthly costs for housing (row 10)	Euro/m2 and month	Average rent for housing units	See pag. 263 in Pfaffenbichler, P., 2003, "The strategic, dynamic and integrated urban land use and transport model MARS (Metropolitan Activity Relocation Simulator).	Lisbon: www.bpiimobiliario.pt
Average living space per housing unit (row 11)	m2		See pag. 264 in Pfaffenbichler, P., 2003, "The strategic, dynamic and integrated urban land use and transport model MARS (Metropolitan Activity Relocation Simulator).	Lisbon: www.bpiimobiliario.pt
Ratio of living space to built up space (row 12)	dmnl	Floor-area ratio by zone. How high is it allowed to build in a zone? This is measured in MARS in the ratio of usable floor space which a developer can get out of a unit surface area.		
The number of un-occupied housing units in the base year (row 13)	flats	Housing units which are available in the housing market.		Lisbon: www.ine.pt
The number of workplaces (row 15)	workplaces	This number should include the workplaces of self employed people as well as informal workplaces.	See pag. 262 in Pfaffenbichler, P., 2003, "The strategic, dynamic and integrated urban land use and transport model MARS (Metropolitan Activity Relocation Simulator).	
The share of the production sector and the share of the service sector (row 16, 17)	percentage	In the MARS model these two should add to 100%.	See pag. 265 in Pfaffenbichler, P., 2003, "The strategic, dynamic and integrated urban land use and transport model MARS (Metropolitan Activity Relocation Simulator).	
The average number of workplaces in a production and service sector business (row 18,19)	worplaces		See pag. 265 and 266 in Pfaffenbichler, P., 2003, "The strategic, dynamic and integrated urban land use and transport model MARS (Metropolitan Activity Relocation Simulator).	
The average space occupied by a production and service sector business (row 20,21)	m2		See pag. 266 in Pfaffenbichler, P., 2003, "The strategic, dynamic and integrated urban land use and transport model MARS (Metropolitan Activity Relocation Simulator).	
Car and motorcycle ownership (row 23,24)	vehicles/1000 residents		See pag. 242 in Pfaffenbichler, P., 2003, "The strategic, dynamic and integrated urban land use and transport model MARS (Metropolitan Activity Relocation Simulator).	
The area covered by each zone (row 26)	km2	For example: a zone covers 100 km2. 30% are already built up in the base year. I.e. 70% are undeveloped. Of the 70 km2 which are undeveloped, 50% can be developed with housing, 10% can be developed for commercial purposes and 40% are protected. Protected means that it is not possible to develop buildings in this area. This can also be due to the existence of mountains, lakes, rivers, etc.	See pag. 269 in Pfaffenbichler, P., 2003, "The strategic, dynamic	
The percentage of land which is undeveloped (%) (row 27)			See pag. 269 in Pfaffenbichler, P., 2003, "The strategic, dynamic and integrated urban land use and transport model MARS (Metropolitan Activity Relocation Simulator).	
The percentage of the developable land which is developable for residential purposes, commercial purposes and protected (row 28-30)			See pag. 269 in Pfaffenbichler, P., 2003, "The strategic, dynamic and integrated urban land use and transport model MARS (Metropolitan Activity Relocation Simulator).	
Whether production sector and service sector development is allowed in a zone (row 32, 33)	yes/no			

Variable	Unit	Notes	Vienna Case Study	Other Sources
The price of land (row 34)	Euro/m2		See pag. 264 in Pfaffenbichler, P., 2003, "The strategic, dynamic and integrated urban land use and transport model MARS (Metropolitan Activity Relocation Simulator).	
Car Distance				
Distance matrix Car	km	There are different ways to construct this matrix. The simplest one is to measure the direct line between the centers of gravity of 2 zones and to apply a detour factor. For many European cities commercial route searching software is available (e.g Madrid). This can also be used to get the distances between the centers of gravity of two zones. Another one is to aggregated data from a more detailed assignment model (if available).	Measuring the direct line between the centers of gravity of 2 zones and applying a detour factor. See pag. 251 in Pfaffenbichler, P., 2003, "The strategic, dynamic and integrated urban land use and transport model MARS (Metropolitan Activity Relocation Simulator). Concerning intra-zonal distances, see pag. 248 in Pfaffenbichler, P., 2003, "The strategic, dynamic and integrated urban land use and transport model MARS (Metropolitan Activity Relocation Simulator).	Madrid: http://callejero.paginasamarillas.es.
Car Vector Data				
Average walking time from origin to the parking place (off peak row 5, peak row 9)	min	Estimated by expert judgment.	See pag. 245 in Pfaffenbichler, P., 2003, "The strategic, dynamic and integrated urban land use and transport model MARS (Metropolitan Activity Relocation Simulator).	
Average time needed to find a parking place at the destination (off peak row 6, peak row 10)	min	Estimated by expert judgment.	See pag. 245 in Pfaffenbichler, P., 2003, "The strategic, dynamic and integrated urban land use and transport model MARS (Metropolitan Activity Relocation Simulator).	
Average walking time from parking place to the destination (off peak row 7, peak row 11)	min	Estimated by expert judgment.	See pag. 245 in Pfaffenbichler, P., 2003, "The strategic, dynamic and integrated urban land use and transport model MARS (Metropolitan Activity Relocation Simulator).	
Long term parking fee (off peak row 15, peak row 21)	Euro/stay	The sub-division of parking in short term and long term deals more with the legislation of parking than with how long people really will stay. Short term means limited parking zones. Long term refers to parking lots where the allowed time is not limited. For example: during the off peak period the charge for a long term stay is 5 Euros (row 15). Of all parking place in the zone which are suitable for long term parking 80% (row 16) are charged. 20% are uncharged on street parking. The fee for short term parking is 1 Euro per stay (row 17). Only 10% of all parking places suitable for short term parking are charged (row 18). Only 10% of the off peak trips require a long term stay (row 19).	See pag. 245 and 246 in Pfaffenbichler, P., 2003, "The strategic, dynamic and integrated urban land use and transport model MARS (Metropolitan Activity Relocation Simulator).	
The ratio of long term parking places in the zone which is charged (off peak row 16, peak row 22)	percentage			
Short term parking fee (off peak row 17, peak row 23)	Euro/stay			
The ratio of short term parking places in the zone which is charged (off peak row 18, peak row 24)	percentage			
The ratio of trips which require long term parking (off peak row 19, peak row 25)	percentage			
Car Free flow speed				
Matrix free flow speed Car	km/h		See pag. 253 in Pfaffenbichler, P., 2003, "The strategic, dynamic and integrated urban land use and transport model MARS (Metropolitan Activity Relocation Simulator).	
Car Speed				
Matrix actual speed Car during off peak	km/h		See pag. 254 e 255 in Pfaffenbichler, P., 2003, "The strategic, dynamic and integrated urban land use and transport model MARS	
Matrix actual speed Car during peak	km/h			
Car Road charge				
Matrix actual road charge Car during off peak	Euro/trip			
Matrix actual road charge Car during peak	Euro/trip			
PT distance				

Variable	Unit	Notes	Vienna Case Study	Other Sources
Distance matrix PT	km		As all the zones are very well covered with PT lines, the distance matrix is the same than the distance matrix for PC. See pag. 250 in Pfaffenbichler, P., 2003, "The strategic, dynamic and integrated urban land use and transport model MARS (Metropolitan Activity Relocation Simulator).	
PT Distance PT stop				
Matrix average distance origin and destination to the next PT stop	min	There are different ways to construct this matrix.The walking time from source i to public transport stop depends on area of zone; number of public transport stops in zone; walking speed and detour factor	See pag. 244 in Pfaffenbichler, P., 2003, "The strategic, dynamic and integrated urban land use and transport model MARS (Metropolitan Activity Relocation Simulator).	
PT Headway time				
Matrix PT headway times off peak	min	The possibilities range from expert judgment over route search programs to aggregated data from detailed assignment models.	These matrixes are needed to calculate the average waiting times at PT stops. The headway times are estimated by aggregating the relevant PT lines per OD pair (e.g. the one available at http://www.vor.at/). See pag. 258 e 259 in Pfaffenbichler, P., 2003, "The strategic, dynamic and integrated urban land use and transport model MARS (Metropolitan Activity Relocation Simulator).	
Matrix PT headway times peak	min			
PT Changing time				
Matrix PT Changing time off peak	min	Changing time from PT stop I to PT stop J.	See pag. 259 in Pfaffenbichler, P., 2003, "The strategic, dynamic and integrated urban land use and transport model MARS (Metropolitan Activity Relocation Simulator).	
Matrix PT Changing time peak	min	Changing time from PT stop I to PT stop J.	See pag. 258 in Pfaffenbichler, P., 2003, "The strategic, dynamic and integrated urban land use and transport model MARS (Metropolitan Activity Relocation Simulator).	
PT share metro				
Matrix PT share metro off peak	percentage	The share of public transport which operates independently from road traffic.		
Matrix PT share metro peak	percentage			
PT speed metro				
Matrix PT speed metro peak	km/h	The average speed of public transport which operates independently from road traffic.		
PT Fare				
Matrix PT fare per trip during off peak	Euro			
Matrix PT fare per trip during peak	Euro			