## Tables

<table>
<thead>
<tr>
<th>Table</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1</td>
<td>Price instruments and policy objectives</td>
<td>44</td>
</tr>
<tr>
<td>2.2</td>
<td>Non-price instruments and policy objectives</td>
<td>48</td>
</tr>
<tr>
<td>3.1</td>
<td>Description of common scenarios</td>
<td>60</td>
</tr>
<tr>
<td>4.1</td>
<td>The structure of the welfare function</td>
<td>69</td>
</tr>
<tr>
<td>4.2</td>
<td>Optimal tax rules</td>
<td>76</td>
</tr>
<tr>
<td>4.3</td>
<td>Assumptions on the marginal cost of public funds</td>
<td>80</td>
</tr>
<tr>
<td>4.4</td>
<td>Price elasticities literature</td>
<td>82</td>
</tr>
<tr>
<td>4.5</td>
<td>Corresponding price elasticities</td>
<td>82</td>
</tr>
<tr>
<td>4.6</td>
<td>Different model versions</td>
<td>84</td>
</tr>
<tr>
<td>5.1</td>
<td>The structure of the welfare function</td>
<td>98</td>
</tr>
<tr>
<td>5.2</td>
<td>Overview of possible exercises</td>
<td>109</td>
</tr>
<tr>
<td>6.1</td>
<td>Dimensions of the spatial version of the TRENEN-Amsterdam model</td>
<td>127</td>
</tr>
<tr>
<td>6.2</td>
<td>Details of groups, OD pairs and numbers of routes per group</td>
<td>127</td>
</tr>
<tr>
<td>6.3</td>
<td>Characteristic equations from the network model for Amsterdam</td>
<td>128</td>
</tr>
<tr>
<td>6.4</td>
<td>Some parameter values for the simulation presented</td>
<td>129</td>
</tr>
<tr>
<td>6.5</td>
<td>Some simulation results of the linearised TRENEN-Amsterdam model</td>
<td>129</td>
</tr>
<tr>
<td>7.1</td>
<td>The marginal social costs of motorised road transport</td>
<td>137</td>
</tr>
<tr>
<td>7.2</td>
<td>The value of marginal time savings in passenger and freight transport in 2005</td>
<td>140</td>
</tr>
<tr>
<td>7.3</td>
<td>The marginal external congestion costs for Brussels and Belgium in 2005</td>
<td>140</td>
</tr>
<tr>
<td>7.4</td>
<td>The impacts of air pollutants considered by ExternE-Transport</td>
<td>142</td>
</tr>
<tr>
<td>7.5</td>
<td>Damage costs per g of pollutant</td>
<td>143</td>
</tr>
<tr>
<td>7.6</td>
<td>The use of the ExternE-Transport results in the case studies</td>
<td>143</td>
</tr>
<tr>
<td>7.7</td>
<td>The marginal external air pollution costs of passenger cars in Brussels in the reference equilibrium</td>
<td>144</td>
</tr>
<tr>
<td>7.8</td>
<td>The marginal external air pollution costs of interregional transport in Belgium in the reference equilibrium</td>
<td>145</td>
</tr>
<tr>
<td>7.9</td>
<td>The marginal external air pollution costs of urban public transport</td>
<td>145</td>
</tr>
</tbody>
</table>
List of tables

7.10 The accident risks in the benchmark equilibrium 149
7.11 The pure economic costs of the different accident categories 149
7.12 The marginal external accident costs of transport in Brussels and Belgium in the initial equilibrium 150
7.13 Marginal external noise cost in Brussels in 2005 153
7.14 General overview of the marginal external costs in the initial equilibrium in Brussels and Belgium 154
7A.1 The time–flow relationship 160
7A.2 Damage estimates for a gasoline passenger car in different locations 161
7A.3 Average emission factors of a gasoline car in g/vkm 162
7A.4 ExternE emissions for urban and interregional passenger car traffic 163
7A.5 Auto-Oil I emission reductions for 1996–2010 164
7A.6 Fuel consumption with standard and improved fuel efficiency 164
7A.7 The emission factors for gasoline cars – urban case studies 165
7A.8 The emission factors for diesel cars – urban case studies 166
7A.9 The emission factors for interregional public passenger transport 167
7A.10 The emission factors for interregional freight transport 167
7A.11 The marginal external costs in the initial equilibrium – Amsterdam 168
7A.12 The marginal external costs in the initial equilibrium – Dublin 168
7A.13 The marginal external costs in the initial equilibrium – London 169
7A.14 The marginal external costs in the initial equilibrium – Ireland 169
8.1 Estimates of the marginal and average accident risk 178
10.1 Functional forms tested in selection of unit time–flow relationship for TRENEN 197
10.2 Summary statistics derived from non-linear curve-fitting routine 198
10.3 Network parameters for Dublin and Dubai 201
11.1 Characterisation of the reference situation 220
11.2 Key results of optimal policy 225
11.3a Taxes in reference situation and optimal pricing 227
11.3b Generalised prices for reference and optimal pricing 228
11.3c Generalised prices in reference and optimal pricing 228
List of tables

11.4 Changes in consumer surpluses for two scenarios 232
11.5 Money price changes of a vehicle kilometre caused by fuel price increases 233
11.6 Emission reductions 235
11.7 Main components of welfare 235
11.8a Key results of counterfactual equilibria, reference parking charges, reference technology 236
11.8b Key results of counterfactual equilibria, improved parking charges, reference technology 236
11A.1 Characterisation of optimal pricing, improved parking charges 240
11A.2 Characterisation of cordon pricing, reference parking charges 241
11A.3 Characterisation of uniform pricing, reference parking charges 242
11A.4 Characterisation of improved parking charges 243
12.1a Consumer price in Euros per vehicle-km 253
12.1b Price per litre fuel in Euros 253
12.1c Money price public transport per passenger-km in Euros 254
12.1d Resource vehicle costs, net of tax, in Euros per car-km 254
12.1e Resource cost in Euros per litre fuel 254
12.1f Total resource cost in Euros per vehicle-km 255
12.1g The proportions in which the vehicle fleet types are used 255
12.1h Average occupancy rate in persons per vehicle in public transport 256
12.1i The demand in passenger-km per representative individual per day 256
12.1j (Cross-) price elasticities 256
12.2 Characterisation of the reference situation 259
12.3 Key results of optimal policy compared with reference situation 262
12.4a Taxes in reference situation and optimal pricing 263
12.4b Generalised prices in reference situation and optimal pricing 263
12.4c Composition of generalised prices in reference and optimal pricing for a small petrol car driven alone by an inhabitant not paying for parking 264
12.5 Percentage changes in consumer surpluses for two scenarios 266
12.6a Key results of counterfactual equilibria, reference parking charges, reference technology 267
12.6b Key results of counterfactual equilibria, reference parking charges, regulation of technology 267
12.6c Key results of counterfactual equilibria, improved parking charges, reference technology 268
12.6d Key results of counterfactual equilibria, improved parking charges, regulation of technology 268
12A.1 Average trip length 1995 TRENEN zones in kms: public transport 270
12A.2 Average trip length 1995 TRENEN zones in kms: bicycle 271
12A.3 Average trip length 1995 TRENEN zones in kms: car 271
12A.4 Kilometrage 1995 TRENEN zones: public transport 271
12A.5 Kilometrage 1995 TRENEN zones: bicycle 271
12A.6 Kilometrage 1995 TRENEN zones: car 271
12A.7 Average trip duration 1995 TRENEN zones in minutes: public transport 272
12A.8 Average trip duration 1995 TRENEN zones in minutes: bicycle 272
12A.9 Average trip duration 1995 TRENEN zones in minutes: car 272
12A.10 Characterisation of the full optimum (FO) with improved parking charges and standard emission technologies 273
12A.11 Characterisation of the cordon pricing (CO) with reference to parking charges and standard emission technologies 274
13.1 Values of time used in DTI study 280
13.2 Resource costs for bus and rail 282
13.3 Resource costs, prices, taxes and external costs in the reference situation 284
13.4 Naming convention for option tests 285
13.5 Key results from the full optimum pricing scenario 286
13.6 Taxes in reference and full optimum scenarios 286
13.7 Sensitivity tests for the 2005 TRENEN model 287
13.8 Reference passenger-kilometres demanded over total population 288
13.9 Percentage reference market share of transport quantities demanded 288
13.10 Full optimum passenger-kilometres demanded over total population 290
13.11 Percentage full optimum market share of transport quantities demanded 290
13.12 Comparison of taxes in sensitivity tests 291
13.13 Comparison of money price in sensitivity tests 292
13.14 Percentage change in overall results w.r.t. reference scenario 293
14.1 Comparison of full optimum with reference case 315
14.2 Comparison of cordon pricing with reference case 317
14.3 Comparison of uniform pricing with reference case 317
14.4 Welfare changes from varying technology and parking charges 318
14.5 Key results of counterfactual equilibria 320
14A.1 Characterisation of the reference situation 323
14A.2 Characterisation of the full optimum situation 324
14A.3 Characterisation of the cordon pricing situation 325
14A.4 Characterisation of the uniform pricing (1) situation 326
14A.5 Characterisation of the uniform pricing (2) situation 327
15.1 Marginal external costs in the reference situation 341
15.2a Price elasticities passenger transport 342
15.2b Price elasticities freight transport 342
15.3 Characterisation of the reference situation 344
15.4 Taxes and marginal external costs in the full federal optimum 347
15.5a Key results of the full federal optimum: total demands 349
15.5b Key results of the full federal optimum: composition of demands 349
15.5c Technology choice and welfare components of the full federal optimum 350
15.5d Percentage increase of fuel prices w.r.t. reference situation 350
15.6 Prices and price increases in the ‘uniform pricing’ (UP) scenario 352
15.7 Optimal toll on highways 354
15.8 Congestion pricing (CP): public transport prices 355
15.9 Comparison of welfare effects of the different scenarios 357
15.10 Taxes and local marginal external costs in the Nash equilibrium, no price discrimination 361
15A.1 Uniform pricing scenario: total demands 364
15A.2a Uniform pricing scenario: demand composition passengers 364
15A.2b Uniform pricing scenario: demand composition freight 365
15A.3 Uniform pricing scenario: welfare effects 366
15A.4 Congestion pricing scenario: total demands 367
15A.5a Congestion pricing scenario: demand composition passengers 367
15A.5b Congestion pricing scenario: demand composition freight 368
15A.6 Congestion pricing scenario: welfare effects 368
15A.7 Nash equilibrium scenario: total demands 369
15A.8a Nash equilibrium scenario: demand composition passengers 369
<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>15A.8b</td>
<td>Nash equilibrium scenario: demand composition freight</td>
</tr>
<tr>
<td>15A.9</td>
<td>Nash equilibrium scenario: technology choice and welfare components</td>
</tr>
<tr>
<td>16.1</td>
<td>Transport flows and modal shares, reference situation</td>
</tr>
<tr>
<td>16.2</td>
<td>Prices, taxes and marginal external costs in the reference situation</td>
</tr>
<tr>
<td>16.3</td>
<td>Taxes and marginal external cost in full optimum for 2005</td>
</tr>
<tr>
<td>16.4</td>
<td>Modal shares in the reference (RF) and the full optimum (FO)</td>
</tr>
<tr>
<td>16.5</td>
<td>Some other key results of the optimal policy</td>
</tr>
<tr>
<td>16.6</td>
<td>Technology choice and welfare components</td>
</tr>
<tr>
<td>16.7</td>
<td>Speeds and tax revenues</td>
</tr>
<tr>
<td>16.8</td>
<td>Taxes and marginal external costs for policies</td>
</tr>
<tr>
<td>16.9</td>
<td>Key results of policy without time-differentiated policy</td>
</tr>
<tr>
<td>16.10</td>
<td>Market share for each mode type</td>
</tr>
<tr>
<td>16.11</td>
<td>Technology choice and welfare components</td>
</tr>
<tr>
<td>16.12</td>
<td>Key results of policies</td>
</tr>
<tr>
<td>17.1</td>
<td>Characteristics of the areas studied</td>
</tr>
<tr>
<td>17.2</td>
<td>Prices, taxes and costs for the urban case studies in the full optimum scenario</td>
</tr>
<tr>
<td>17.3</td>
<td>Prices, taxes and costs for the interregional case studies in the full optimum scenario</td>
</tr>
<tr>
<td>17.4</td>
<td>Total volume and composition of traffic</td>
</tr>
<tr>
<td>17.5</td>
<td>Speeds</td>
</tr>
<tr>
<td>17.6</td>
<td>Prices, taxes and costs</td>
</tr>
<tr>
<td>17.7</td>
<td>Volumes, composition of traffic and speeds</td>
</tr>
<tr>
<td>17.8</td>
<td>Welfare, total external costs and tax revenues</td>
</tr>
</tbody>
</table>