

Suzanne Van Brussel



The Art of Governing in the Complex Mobility Transition

The Value of Adding an
Orgware Agenda



PhD
series

// IN //
PLAN //
/ NING

**De kunst van het besturen in de complexe mobiliteitstransitie
De toegevoegde waarde van een orgware-agenda**

**The Art of Governing in the Complex Mobility Transition
The Value of Adding an Orgware Agenda**

Suzanne Van Brussel

**Promotoren: prof. dr. ir. L. Boelens, prof. ir. D. Lauwers
Proefschrift ingediend tot het behalen van de graad van
Doctor in de stedenbouw en de ruimtelijke planning**



**UNIVERSITEIT
GENT**

**Vakgroep Civiele Techniek
Voorzitter: prof. dr. ir. P. Troch
Faculteit Ingenieurswetenschappen en Architectuur
Academiejaar 2017 - 2018**

ISBN 978-94-6355-131-1

NUR 901, 976

Wettelijk depot: D/2018/10.500/49

Examination committee

Prof. Dr. Paul Kiekens, Ghent University (chairman)

Prof. Ir. Filip Boelaert, Ghent University

Prof. Dr. Ir. Marcel Hertogh, TU Delft

Prof. Dr. Cathy Macharis, Vrije Universiteit Brussel

Prof. Dr. Veronique Van Acker, Ghent University

Prof. Dr. Ir. Luuk Boelens (supervisor)

Prof. Ir. Dirk Lauwers (supervisor)

The research reported in this dissertation was conducted at the Centre for Mobility and Spatial Planning, Department of Civil Engineering, Faculty of Engineering and Architecture of Ghent University and funded by the Urban Logistics and Mobility project

Dankwoord

Eerder slaakte ik een zucht van opluchting bij het finaliseren van mijn masterproef: zoiets hoefde ik immers niet meer te schrijven. Niets was echter minder waar... Dit proefschrift is het levend bewijs. De avond nadat ik mijn masterproef bij professor Lauwers succesvol had verdedigd, kreeg ik een miltje van professor Boelens of ik niet wilde starten als doctoraatsbursaal op een project over de governance van een duurzame mobiliteit. Daar kon ik toch moeilijk voor passen? Voor ik het goed en wel besepte bleef ik niet alleen student, maar werd ik nu ook medewerker bij de UGent, meer bepaald de Afdeling Mobiliteit en Ruimtelijke Planning (AMRP). Naast een studentenkaart kreeg ik ook nog een personeelskaart op zak. Enter Academia. Onder de academische vleugels van Luuk en Dirk, mijn promotoren, en de praktische vleugels van Els (ofte 'Els-Els') nam mijn doctoraat een vliegende start. De AMRP op de Vrijdagmarkt was mijn nieuwe thuis. De overstap van student naar doctoraatsstudent leek simpel: prof. Boelens werd 'Luuk', prof. Lauwers werd 'Dirk'. Eerlijk? Zonder Luuk of Dirk had ik dit veelzijdige avontuur nooit mogen meemaken, ik ben hen dankbaar voor het vertrouwen dat ze in me stelden, de kansen die ze me gaven en hun leerrijke feedback op om het even welk uur van de dag.

Hoewel het lokaal waarin ik begon op AMRP eigenlijk voorbehouden was voor de MRB, de onderzoeksgroep Milieu en Ruimtebeheer of iets dergelijks – niemand die het nog weet, installeerde ik me al snel tussen Jonas, Joke en Samuel (ofte 'Amule'). Bij mijn eerste blik door het lokaal bleven mijn ogen rusten op een blad papier dat op de ingemaakte kast gekleefd was, getiteld: "*How to fail a PhD*"; de ironisch-satirische signatuur van Jonas leverde veel interessante gesprekken op, maar evenzeer geklets en gezever. Gezelligheid troef! Ook de burens brachten leven in de brouwerij. De vele lachsalvo's of telefoongesprekken van Barbara waarvan de decibels dwars door de muren gingen, de gouden raad en stipte lunchverzoekjes van Els, de energieke tred van Thomas door de gang en de gezellige babbel na de lunch – hij was meestal wat laat met lunchen, of de vele nieuwtjes van Karel ontgingen me niet. Het was een amusant verdiep daarboven op +5 en het leek wel altijd vrijdag of markt daar op de Vrijdagmarkt. Merci, jullie allemaal!

De maanden vlogen voorbij. Ik kreeg de kans om studenten te begeleiden, verschillende congressen en dus ook Europese steden aan te doen, en talloze interessante persoonlijkheden te ontmoeten. Ik wil ook zeker de enthousiastelingen bedanken die ik bij het voeren van mijn onderzoek in binnen en buitenland tegenkwam of mocht interviewen. De verschillende casestudies en interviews of vergaderingen vormden de perfecte afwisselingen voor het bij momenten eenzame bureauwerk en gaven me telkens weer nieuwe energie om door te gaan. In het bijzonder wil ik het Ringland team bedanken voor hun gastvrijheid en gulle medewerking, maar ook voor de boeiende wending die zij wisten te forceren in het Oosterweeldossier, een case die ik graag opnam in mijn onderzoek. Huib, bedankt dat ik in de marge mocht meewerken aan het *CurieuzeNeuzen* onderzoek, het leverde me alvast een relatief vlotte tweede 'A1' op.

Naast de theorie van Academia, kwam gelukkig ook op tijd en stond de bezigheid van de vrije grafiek, in de academie voor beeldende kunsten te Gent. Wanneer ik mezelf vast reed in de literatuur over duurzame mobiliteit, governance of *complexity*, liet ik mijn gedachten de vrije loop tijdens het snijden in hout of linoleum en het krassen in koper of in pvc in het grafiek atelier, waar ik door Vladimir, Marnix, Liesbeth en mijn vele medestudenten ondergedompeld werd in de wonderde wereld van de vrije grafiek.

Langzaamaan, zoals het een succesvolle onderzoeksgroep betaamt, werden doctoraten afgerond, verhuisden collega's van boven (*pre-docs*) naar beneden (*post-docs*), of bewandelden ze nieuwe wegen. Er waren tijden van komen en gaan. Toen eerst Joke, daarna Samuel, en uiteindelijk ook Jonas elk op hun beurt vertrokken waren, was ik plots de 'ancien'. Raar. Gelukkig namen Hwachyi, Linda, Jiajia, Isabelle en tijdelijk ook Thomas hun intrek in mijn lokaal. Maja nam intussen het roer over van 'Els-Els' en werd mijn dagelijkse fietsgenoot en blijmoedige bijna-buurvrouw in Ledeberg. Nog later kwamen Beitske, Peter, Chloé en Annelies. Tom en Amir sloten de gelederen. Het samen optrekken voor een lunch naar Resto De Brug was altijd een lichtpunt tijdens mijn laatste loodjes. Zelfs de jarenlang aangekondigde, maar steeds uitgestelde verhuis van AMRP mocht ik nog meemaken, van de Vrijdagmarkt naar Blok B van Technicum in de Sint-Pietersnieuwstraat. Maar ook mijn tijd was bijna verstreken; de noodzakelijke publicaties (twee A1's) behaald...

Het lokaal hing steeds meer samen met het afronden van mijn doctoraat. Het begon te lijken op een academische *escape room*. Voor de niet-kenner: een *escape room* is een kamer, of beter nog, een rariteitenkabinet waaruit je binnen een bepaalde tijdspanne moet proberen ontsnappen door creatief raadseltjes op te lossen. Wel, mijn lokaal werd af en toe ook zo'n *escape room* waarin ik mezelf meermaals tegenkwam, maar waaruit vele van mijn voorgangers klaarblijkelijk al wisten te ontsnappen. Eigenlijk is de metafoor van de escaperoom nog niet zo gek. In zo'n escaperoom ligt de tijd ook vast. Hoewel je daarin vaak slechts één uur de tijd krijgt, gaat het bij een doctoraat om een luttele vier jaar. Toch zijn er gelijkenissen. In het begin is er tijd genoeg en lijkt alles mogelijk of haalbaar – *the sky is the limit*. In het midden van het spel twijfel je weleens. *Ben je eigenlijk wel goed bezig? Zou je geen tips vragen? Hoeveel tijd is er nog? Naar het einde toe wordt het zwaar menens. Geraak je wel op tijd rond met alle raadsels? Geraak je wel buiten? Of blijf je zitten in de kleine kamer?* Ook dat is vergelijkbaar met het schrijven van een doctoraat, waarbij je af en toe, gekluisterd aan je bureau, veroordeeld bent tot het schrijven van je doctoraat. Hoewel je steeds beter weet waar je naartoe wil, wordt het een gevecht tegen de tijd. Schrijven, schrijven, schrijven. Els, Barbara en Thomas, mijn excuses dat ik niet altijd op de meest galante uren de afrondingsperikelen weer bij jullie naar boven bracht; jullie betekenen heel veel voor mij! Maja, bedankt om de laatste beslommeringen en formaliteiten hier en daar voor me in orde te brengen, en altijd klaar te staan voor een extra hart onder de riem; "*Keep Calm & Keep Writing*", het kaartje dat je stiekem in mijn brievenbus dropte prijkt nog steeds op de schoorsteen. Chloé, ook jou kon ik *à la limite* nog inschakelen om de nog her en der resterende Nederlandstalige sporen in de tekst uit te wissen, ik sta bij je in het krijt! Dankzij al jullie duwtjes in de rug kon ik eindelijk indienen.

Na het indienen was het aan de examencommissie om te beslissen of ik de kamer mocht verlaten. Bij deze wil ik dan ook mijn juryleden in het bijzonder bedanken voor hun interessante feedback en vertrouwen. Het zijn zij die voor mij de deur naar de vrijheid weer openden.

Wanneer het allemaal even te veel werd, was er gelukkig ook nog mijn familie en vriendenkring. Altijd stonden zij klaar en gelukkig konden zij het vaak toch net iets beter relativeren. Eigenlijk reden zij in alle stilte mijn hele doctoraatsparcours mee, zorgden ze voor de bevoorrading op de belangrijke en moeilijke momenten en brachten ze leven in de brouwerij en verstrooiing wanneer ik dat goed kon gebruiken. Daarvoor ben ik hen oprecht dankbaar; mama en papa voor jullie onvermoeibare steun, eeuwige anticipatievermogen en gouden raad bij dagdagelijkse beslommingen; Zus en Irvan voor de letterlijke en figuurlijke nabijheid als bovenstebesteburen – *#burenforever*; Marijn om zo liefdevol en geduldig te zijn en te blijven ook al had ik soms mijn dagje(s) niet en stond mijn gezicht op onweer. Ach, jou maak ik met mijn doctoraat gelukkig zo gauw nog niet nerveus; die dolle huizenjacht was een ander paar mouwen zeker?

Stilaan groeide de goesting om de planningspraktijk in te duiken; een pad dat door enkele van mijn oud-collega's reeds met glans werd bewandeld. Dat de opdrachten "kortlopende" en praktischer mochten zijn, daar was ik wel uit. Dat het Atelier Romain zou worden, wist ik eigenlijk al nadat ik er als jobstudent in de vakantie van 2013 gewerkt had. Mijn intrede in de praktijk was dan iets drukker dan gepland, gelukkig werd ik ook bij Romain warm onthaald en stond 'de GIS-cel' steeds klaar om me te helpen bij de brute overgang van ArcGIS naar QGIS en nog zoveel meer.

Dankzij al jullie steun geraakte ook ik tijdig uit die escape room. Terwijl de volgende lichting AMRP'ers zich opmaakt om de room te betreden, maak ik me klaar voor de nieuwe mobiliteits- en planningsuitdagingen; maar vooral om er weer eens met jullie op uit te trekken *#YOLO* – maar duurzaam en veilig graag!

Suzanne
juni 2018, Gent

Table of Contents

Dankwoord 7
Figures 13
Tables 16
Acronyms 17
Samenvatting 19
Summary 24

1 Attention to governance, please? 29

1.1 Mobility issues are “wicked” problems 30
1.2 Towards new perspectives in mobility planning 33
1.3 Outline and research questions 39

2 Addressing wicked, complex governance problems – towards a theoretical framework 43

2.1 Wickedness and complex adaptive systems 44
2.2 The orgware: on the interplay between actor networks and structure 49
2.3 Governing complex adaptive systems 59
2.4 Building a theoretical Framework: the application towards a sustainable mobility system 73

3 Methodology 83

3.1 Multiple case study research 84
3.2 Selection of cases 85
3.3 Data collection and analysis 87
3.4 Visualising the results 90

4 The Flemish mobility and its relation to spatial planning in retrospect 95

4.1 Transport planning versus spatial development: a brief retrospective 96
4.2 More recent efforts in spatial and transport planning 103
4.3 Conclusions 111

5 Regional mobility cooperation 113

5.1 Unravelling the SLUIZO/MOZO orgware 114
5.2 Case regional cooperation Mechelen 126
5.3 Conclusions regional mobility cooperation 151

6 De Verkeersonderneming Rotterdam 153

6.1 Problematisation 154
6.2 Interessement 156
6.3 Enrolment: actors and organisation 157
6.4 Mobilisation of allies: evolving activities 162
6.5 Results and discussion 175

| | | |
|-----------|---|------------|
| 7 | Large Infrastructure projects | 179 |
| 7.1 | Selection of case and specific methodology | 180 |
| 7.2 | Complex interplay of different actors and their translation processes | 181 |
| 7.3 | Case Epilogue - highlights of a roundtable discussion | 200 |
| 7.4 | Summarising the changing setting | 208 |
| 7.5 | Results and discussion | 211 |
| 8 | A next step? – inspiration from the ‘CurieuzeNeuzen’ citizen science project | 215 |
| 8.1 | Citizen science | 217 |
| 8.2 | The project’s (grass)roots | 219 |
| 8.3 | Setup of the CurieuzeNeuzen project | 220 |
| 8.4 | Results | 222 |
| 8.5 | Discussion | 229 |
| 8.6 | Conclusions CurieuzeNeuzen | 232 |
| 9 | Conclusions | 233 |
| 9.1 | Main findings | 234 |
| 9.2 | The two-tiers challenge for the orgware? | 245 |
| 9.3 | Applicability of and reflections on the theoretical framework | 253 |
| | Appendices | 255 |
| 10 | Appendix 1 | |
| | Overview of the interviews and attended events per case | 256 |
| 10.1 | Case regional mobility cooperation | 256 |
| 10.2 | Case entrepreneurial mobility cooperation the VO | 259 |
| 10.3 | Case LIP Oosterweel Link | 262 |
| 11 | Appendix 2 | |
| | Data acquisition, data analysis and visualisation | 267 |
| 11.1 | Case regional mobility cooperation | 267 |
| 11.2 | Case entrepreneurial mobility cooperation the VO | 267 |
| 11.3 | Case LIP Oosterweel Link | 276 |
| 11.4 | Ucinet Node Attributes | 283 |
| 12 | Appendix 3 | |
| | Initial route alternatives for the Oosterweel Link project | 284 |
| 13 | Appendix 4 | |
| | CurieuzeNeuzen profile of participants and project outreach | 288 |
| | References | 289 |
| | Internet sources | 300 |

Figures

- Figure 1** Headlines demonstrating that current (spatial or mobility) planning projects in Flanders are a wicked endless Calvary, left: Oosterweel Link Project; upper right: setback of Uplace project; bottom right: opinion on various complex projects. 31
- Figure 2** Dissertation outline 39
- Figure 3** Complicatedness versus complexity. 45
- Figure 4** Comparison of ANT translation phases and ARA planning steps. 52
- Figure 5** Policy implementation cycle. 62
- Figure 6** Notions of co-production in relation to each other and to the policy implementation cycle. 65
- Figure 7** A dynamic multi-level perspective on technological transitions. 67
- Figure 8** Multiple levels as a nested hierarchy. 68
- Figure 9** The dual meaning of reflexive with regard to reflexive governance. 69
- Figure 10** Four approaches on the management of complexity. 71
- Figure 11** Four approaches on the governance of complexity with respect to actors and setting. 71
- Figure 12** System diagram for mobility. 75
- Figure 13** Mobility arenas and their embedding in the environment. 76
- Figure 14** Two tiers approach in planning: forging structural couplings and engaging with condition planning. 78
- Figure 15** Structural coupling of the subsystems of sustainable mobility. 79
- Figure 16** Elements for deconstructing the orgware into differentiated actor networks. 81
- Figure 17** Quadruple helix scheme. 85
- Figure 18** Chronologic of the selected case studies their interrelations and the quadrant of the quadruple helix in which they arose. 87
- Figure 19** Schematic overview of how the actor network diagram is generated. 92
- Figure 20** Legend visualisation. 93
- Figure 21** Status of Local Mobility Plans in 2010. 102
- Figure 22** Generic phases of the complex projects planning approach in Flanders. 105
- Figure 23** (top) Initial division in transport regions 2001; (bottom) demarcation of transport regions at the end of 2017. 108
- Figure 24** Reconstruction of the SLUIZO actor network diagram before 2007. 115
- Figure 25** Actor network diagram SLUIZO in 2007, the municipalities' joint efforts. 116
- Figure 26** Reconstruction of the SLUIZO/MOZO actor network diagram, the hesitant start of the mobility platform at the end of 2008. 116
- Figure 27** Situation and road infrastructure within the SLUIZO study area. 117
- Figure 28** Tangential road network in the SLUIZO region according to level (from primary: I; to local: III) and location with respect to residential area (hatch). 118
- Figure 29** Internal travel patterns from municipalities within the SLUIZO area, often perceived as transit traffic. 119
- Figure 30** Overview of infrastructural clusters that need adaptation. 119
- Figure 31** SLUIZO study outcomes of an integrated scenario, suggesting measures per theme and context. 120
- Figure 32** Study area Noorderkempen. 123
- Figure 33** Reconstruction of the MOZO actor network diagram, the silent death of MOZO and the start of study process Noorderkempen. 124
- Figure 34** Overview of MOZO mobility system. 126
- Figure 35** Major infrastructures in the region of Mechelen. 127
- Figure 36** The first actor network developments of the C-AR (left: very beginning). 128
- Figure 37** Overview of the organisational structure of the inter-municipal cooperation in the region of Mechelen, coordinated by IGEMO. 129
- Figure 38** C-AR actor network developments in enrolling their structure (dashed line represents the strived equivalence with other projects). 131
- Figure 39** Left: the longest cycle track of Europe between the municipality of Putte and the city of Mechelen; right: cycling street network. 135
- Figure 40** Cycling scanning project in Bonheiden first results. 135

- Figure 41** Reconstruction of the problematisation and interessement of the Transport Region Mechelen. 136
- Figure 42** Organisational structures of the C-AR and the transport region and their intertwining illustrated as if it were two households, ending up as one. 139
- Figure 43** The official organogram of the transport region Mechelen. 139
- Figure 44** Enrolment and mobilisation of allies of the transport region Mechelen. 140
- Figure 45** The city regions for region specific intergovernmental cooperation in The Netherlands. 142
- Figure 46** Transport region Antwerp, in relation to former mobility cooperation initiatives or zonations. 144
- Figure 47** Work Platform (Werkplatform). 146
- Figure 48** Composition Working Community (Werkgemeenschap) and relations to the Transport Region Council. 147
- Figure 49** Initial organisation chart of the Transport Region Antwerp. 148
- Figure 50** Organisation chart of the transport region Antwerp in 2018. 148
- Figure 51** Overview of the orgware of C-AR (left) and the transport region of Mechelen (right). 150
- Figure 52** Problematisation – accessibility of City and port of Rotterdam requires cooperation 154
- Figure 53** Road network and access to the port. 155
- Figure 54** Options for extra river crossing west of the city of Rotterdam, the Blankenburg option (route Krabbeplass West – in yellow) was retained. 155
- Figure 55** Interessement – De Verkeersonderneming becomes encapsulated in a dense network 157
- Figure 56** Organogram of the structure of De Verkeersonderneming (based on SOK) 158
- Figure 57** The mobilisation of allies – De Verkeersonderneming is institutionalised and is responsible for new activities 162
- Figure 58** Participants and their degree of activity during the project. 163
- Figure 59** Travel behaviour of the participants in the morning peak. 164
- Figure 60** Motives for participation. 164
- Figure 61** BB target peak avoidances (left) versus registered peak avoidances (right). 165
- Figure 62** Overview of activities VO and positioning of the Marketplace for mobility. 167
- Figure 63** Filedier campaign, raising awareness about habitual travel behaviour. 168
- Figure 64** Filedier campaign, addressing the alternatives in a positive way. 168
- Figure 65** Problematisation – the city’s role in the accessibility and communication about it 170
- Figure 66** Interessement of the city of Antwerp – taking the lead in the accessibility communication 171
- Figure 67** Enrolment and mobilisation of allies: establishing a market for mobility in Antwerp 172
- Figure 68** Overview of the offered tools and services by the *Slim naar Antwerpen* platform. 174
- Figure 69** Schematic overview of the VO orgware. 176
- Figure 70** The Oosterweel Link section (red). 181
- Figure 71** The actor network of the Oosterweel Link project the first project years 182
- Figure 72** The actor network of the Oosterweel Link project in 2005 183
- Figure 73** Model of the Lange Wapper dubble deck viaduct skimming over the city of Antwerp without and with underlying urban fabric. 184
- Figure 74** The actor network of the Oosterweel Link project in 2006 185
- Figure 75** Tunnel variant of the Oosterweel Link on the BAM-route (Horvat). 185
- Figure 76** The alternatives investigated in the environmental impact assessment. 189
- Figure 77** The actor network of the Oosterweel Link project in 2010. 189
- Figure 78** The actor network diagram of the upcoming Ringland initiative at the end of 2012. 190
- Figure 79** Ringland, the concept. 190
- Figure 80** Reconstruction of the Ringland actor network in 2013. 192
- Figure 81** Reconstruction of the Ringland actor network in 2015. 195
- Figure 82** Reconstruction of the actor network of the Oosterweel Link project in 2017. 196
- Figure 83** Compromise proposed by intendant. 197
- Figure 84** Six segments for capping the ring road. 198
- Figure 85** Participants in the roundtable discussion on the LIP Oosterweel Link. 200
- Figure 86** Attention paid to the various aspects of complexity in LIP Oosterweel Link. 202
- Figure 87** Attention to the various aspects of complexity in LIPs in the case Oosterweel Link, the LIP research of Hertogh & Westerveld, and the difference. 203

- Figure 88** The total cost of the Oosterweel Link project over the years, including the Port Route alternative and the total covering of the Ring Road. 204
- Figure 89** The Oosterweel project and the various underlying tracks, events, actions and interactions. 206
- Figure 90** Overview of the LIP Oosterweel Link orgware: a) during the first phases (BAM), b) as proposed by citizen movements, and c) as after the passage of the intendant. 211
- Figure 91** Air quality results map of the CurieuzeNeuzen citizen science project. 223
- Figure 92** Has your attitude changed regarding possible solutions to improve air quality (compared to before the start of *CurieuzeNeuzen*)? (n=660) 229
- Figure 93** Are there things you are doing differently or plan to do differently because of your participation to *CurieuzeNeuzen*? (N=655) 229
- Figure 94** Mobility arenas and their embedding in the environment. 235
- Figure 95** Four approaches on the governance of complexity with respect to actors and setting. 238
- Figure 96** Summary of the cases' orgware (in green the targeted mobility market actors, in blue the targeted conditions associated with the markets, dashed lines initially aspired to include, but eventually left out). 244
- Figure 97** Distribution of sources according to Oosterweel Link or Ringland over time. 276
- Figure 98** ABM Alternative variant 1, black large dots: viaduct, black small dots: tunnel. 284
- Figure 99** ABM Alternative variant 2, black large dots: viaduct, black small dots. 284
- Figure 100** ABM Alternative variant 3, black large dots: viaduct, black small dots: tunnel. 285
- Figure 101** ABM Alternative variant 4. 285
- Figure 102** ABM Alternative variant 5. 286
- Figure 103** ABM Alternative variant 6. 286
- Figure 104** ABM Alternative variant 7. 287

Tables

- Table 1** Cases and Case specific methods for data acquisition and analysis 88
- Table 2** Differences between traditional transport plans and SUMP. 100
- Table 3** Exploitation costs of De Lijn for the customised transport. 110
- Table 4** Exploitation costs of De Lijn for the core and supplementary network. 110
- Table 5** Overview organisation De Verkeersonderneming. 162
- Table 6** Segments, design teams and estimated costs for covering the Antwerp Ring Road. 199
- Table 7** Overview of the interviews for the MOZO case 256
- Table 8** Overview of interviews conducted for the case regional mobility cooperation in Mechelen 257
- Table 9** Overview interviews case De Verkeersonderneming 259
- Table 10** Overview of the interviews for the Marketplace for Mobility Antwerp 259
- Table 11** Overview of the interviews for the case of the LIP Oosterweel Link 262
- Table 12** Overview of the selected actors, their connections, and attributes in the SLUIZO/MOZO case. 268
- Table 13** Overview of the selected actors, their connections, and attributes in the development of regional mobility cooperation in Mechelen. 270
- Table 14** Overview of the selected actors, their connections, and attributes in the case of the VO. 273
- Table 15** Overview of the coded sources for the Oosterweel Link (governmental side). 277
- Table 16** Overview of the selected actors, their connections, and attributes in the case LIP Oosterweel Link (governmental side) 278
- Table 17** Overview of selected actors, connections and attributes of Ringland. 281
- Table 18** Overview of the node attributes used in NVivo and their meaning 283
- Table 19** Age (n: 1,395) 288
- Table 20** Gender (n: 1,398) 288
- Table 21** Highest diploma (n: 1,410) 288
- Table 22** Family situation (n: 732) 288
- Table 23** How many other people did you talk with about the CurieuzeNeuzen research and or de results? (n: 663) 288

Acronyms

| | |
|----------------|---|
| AD | Associative democracy |
| ANT | Actor network theory |
| ANPR | Automatic number plate recognition |
| ARA | Actor relational approach |
| AWV | <i>Agentschap Wegen en Verkeer</i> (Vlaamse Overheid), Agency for Roads and Traffic (Flemish government) |
| BAM | <i>Beheermaatschappij Antwerpen Mobiel</i> |
| BB | <i>Programma Beter Benutten</i> |
| BDU VV | <i>Brede Doeluitkering Verkeer en Vervoer</i> |
| BFF | <i>Bovenlokaal Functioneel Fietsroutenetwerk</i> , supra-local functional bicycle route network |
| BRV | <i>Beleidsplan Ruimte Vlaanderen</i> , Spatial Policy Plan for Flanders |
| C-AR | Cooperation Accessible Region, <i>Samenwerkingsverband Bereikbare Regio</i> |
| CAS | Complex adaptive systems |
| COBUR | <i>Conferentie van Burgemeesters</i> , Conference of Mayors |
| DAM | <i>Comité voor Duurzame Antwerpse Mobiliteit</i> , Committee for sustainable mobility in Antwerp |
| DMOW | <i>Departement Mobiliteit en Openbare Werken (Vlaamse Overheid)</i> , Department of Mobility and Public Works (Flemish government) |
| EC | European Commission |
| EGT | Evolutionary Governance Theory |
| EU | European Union |
| FIT | Flanders Investment & Trade, <i>Vlaams Agentschap voor Innoveren en Ondernemen, VLAIO</i> |
| GRUP | <i>Gewestelijk Ruimtelijk Uitvoeringsplan</i> , Regional Spatial Implementation Plan |
| ICT | Information and communication technology |
| IGEMO | <i>Intergemeentelijke vereniging voor ontwikkeling van het Gewest Mechelen en Omgeving</i> , Intercommunal for the development of the region Mechelen |
| IMOB | <i>Instituut voor Mobiliteit (Universiteit Hasselt)</i> , Hasselt University Transportation Research Institute |
| ITS | Intelligent Transport Systems |
| LEZ | Low Emission Zone |
| LIP | Large Infrastructure Project |
| LMP | Local Mobility Plan |
| MaaS | Mobility as a Service |
| MER/EIA | <i>Milieu-effectenrapportage</i> , Environmental impact assessment |
| MINA | Milieu en Natuurraad van Vlaanderen |
| MIRT | <i>Meerjarenprogramma infrastructuur, ruimte en transport</i> , Multi-year infrastructure, spatial planning and transport programme |
| MLP | Multilevel perspective |
| MORA | <i>Mobiliteitsraad Vlaanderen</i> , Flemish mobility policy council |
| MOZO | <i>Mobiliteitsplatform Zuidoost Antwerpen</i> , Mobility platform for the southeast of Antwerp |
| MRDH | <i>Metropoolregio Rotterdam-Den Haag</i> , Metropole Region Rotterdam-The Hague |
| NMBS | <i>Nationale Maatschappij der Belgische Spoorwegen</i> , National railway company Belgium |
| NPG | New Public Governance |
| NPM | New Public Management |
| OPP | Obligatory Passage Point |
| P+R | Park & Ride |
| PA | Public Administration |
| RQ | Research question |
| RSV | <i>Ruimtelijk Structuurplan Vlaanderen</i> , Spatial Structure Plan for Flanders |
| SARO | Strategische Adviesraad Ruimtelijke Ordening - Onroerend Erfgoed, Strategic Advice Council for Spatial Planning and Heritage |

| | |
|---------------|---|
| SBO | (gesubsidieerd) Strategisch Basis Onderzoek, (subsidised) strategic research project |
| SLUIZO | <i>Sluipverkeer Zuidoost Antwerpen</i> , Study on transit traffic in the southeast of Antwerp |
| SNA | Social Network Analysis |
| SNAPP | <i>Slim naar Antwerpen App</i> , Smarter towards Antwerp App |
| SUMP | Sustainable Urban Mobility Plan |
| TML | Transport and Mobility Leuven |
| TV SAM | Tijdelijke Vereniging Studiegroep Antwerpen Mobiel |
| URT | Urban regime theory |
| VAV | <i>Vraagafhankelijk vervoer</i> , demand-responsive transport |
| VIL | <i>Vlaams Instituut voor Logistiek</i> , Flanders Institute for Logistics |
| VIM | <i>Vlaams Instituut voor Mobiliteit</i> , Flanders Institute for Mobility |
| VO | De Verkeersonderneming |

Samenvatting

Het oplossen van de huidige mobiliteitsproblemen of het sturen van mobiliteit lijkt een lastige zaak vandaag de dag. De huidige mobiliteitsplanningsbenaderingen zitten nog diepgeworteld in een zeer technocratisch discours, waarbij oplossingen worden gezocht in hardware en software interventies. Hiermee wordt bedoeld dat de infrastructurele en technische kant (hardware) en het gebruik ervan (software) het onderwerp zijn van innovatie. Dit terwijl de afstemming ertussen of de organisatie meer algemeen, onderbelicht blijft. We gebruiken het woord orgware, om deze organisatie aan te duiden, omdat het nauw aansluit bij de termen hardware en software, waarmee we meer vertrouwd zijn. Die organisatie zorgt ervoor dat de interventies elkaar kunnen versterken en een effectieve mobiliteitstransitie kunnen ontketenen. Enerzijds mist het huidige mobiliteitsplanningsklimaat interne afstemming met andere beleidskaders, anderzijds mist het ook afstemming met nieuwe of externe actoren. Het actorenveld wordt immers steeds groter terwijl de processen zich vaak nog afspelen tussen de “usual suspects”. Zo verworden mobiliteitsproblemen tot “wicked problems”, waarvoor de geformuleerde oplossingen steeds weer andere problemen genereren. In dit onderzoek richten we ons op dat orgware hiaat in mobiliteit, meer specifiek bij het besturen van mobiliteit in Vlaanderen. Het moet gezegd dat die orgware agenda recent steeds prominenter naar voor komt, maar die is nog pril. In dit proefschrift is de centrale onderzoeksvraag dan ook als volgt:

Wat kan een orgware agenda toevoegen aan de heersende hardware en software benaderingen in de mobiliteitstransitie?

Stapsgewijs wordt deze hoofdvraag uiteengehaald in verschillende deelvragen, die doorheen de verschillende hoofdstukken een antwoord krijgen. Hoofdstuk 1 schetst de aanleiding voor dit onderzoek, de probleemstelling en de vraagstelling. Ook positioneert het zich ten opzichte van recente mobiliteitsdiscourseen. We stellen ons de vraag waarom huidige mobiliteitsproblemen “wicked” zijn en waarom we de complexiteit van mobiliteit maar beter *au sérieux* nemen.

Om te begrijpen hoe we adequaat kunnen omgaan met de complexe mobiliteitsvraagstukken, die inherent zijn aan een complexe realiteit, starten we onze zoektocht doorheen de wetenschappelijke literatuur in hoofdstuk 2 bij de complexiteitstheorie. Het hanteren van een complexiteitsperspectief vergt een aanzienlijke mentaliteitsverandering, omdat zekerheid en voorspelbaarheid worden ingeruild voor emergentie en niet-lineariteit. Als zodanig levert de planner zijn controle over het planningsproces van input naar output in, ten voordele van de autonomie van het proces zelf (throughput). Verder gaan complexiteitstheorieën uit van een systemisch denken: het geheel wordt gezien als een dynamisch samenspel tussen verschillende onderdelen die met elkaar interageren en die elkaar (in)directe beïnvloeden. Problemen die zich in een bepaald deel van het systeem manifesteren, kunnen niet zomaar worden opgelost met een kant-en-klare oplossing, aangezien de problemen zelf door het kluwen van interacties een veelheid aan onverwachte reacties in verschillende andere systemen kan uitlokken. Vandaar krijgen tijds- en plaatsgebonden benaderingen meer aandacht dan generieke (De Roo 2012, Jessop 1997). Om de complexe realiteit te begrijpen, moeten we ons bewust zijn van het grotere plaatje, we moeten met andere woorden meer zicht krijgen op de verschillende delen en hun onderlinge relaties. Het concept van het complex adaptief

systeem (CAS) vindt in toenemende mate zijn weg van de biologiediscipline naar de sociale wetenschappen, en reikt de systemische inzichten aan waarnaar we op zoek zijn. De complexiteitstheorie hanteert een specifiek vocabularium. De dynamieken die binnen deze systemen vanzelf ontstaan worden processen van “zelforganisatie” genoemd, terwijl de onderlinge wisselwerking met andere systemen of delen van het systeem het label “co-evolutie” krijgt opgeplakt.

In paragraaf 2.2 staan de onderdelen van zo'n systeem centraal. Hoe krijgen processen vorm, hoe ontstaan als ze zich niet zomaar laten voorspellen of sturen? In de eerste plaats gaan we uit van de actoren zelf die vorm geven aan het systeem. We hanteren een actor-georiënteerd perspectief, dat voortbouwt op de actor-netwerktheorie (ANT) en de actor-relationale benadering (ARA). De ANT-theorie gaat ervan uit dat actoren gezien moeten worden als onderdeel van associaties, of letterlijk actornetwerken. ANT is gebaseerd op de idee dat actoren continu netwerken, of dus actornetwerken, waardoor ze zichzelf betekenis geven en ze door hun relaties ook betekenis krijgen. Alles moet beschouwd worden als actornetwerk; focussen op de actoren of op het netwerk is slechts een kwestie van in- of uitzoomen. Volgens ANT bestaat er immers niets anders dan het actornetwerk. In de zoektocht naar het verwezenlijken van hun doelstellingen vormen actoren dynamische allianties met andere actoren die dezelfde idealen, plannen, doelstellingen, enz. nastreven; er ontstaan actornetwerken. Het in beeld brengen van de actoren of de actornetwerken vormt dus een eerste uitdaging voor de orgware agenda.

Aangezien actoren niet zomaar netwerken, maar ook uiteindelijk hun stempel willen drukken op datgene dat ze nastreven en mee willen doorwegen in het beslissingsproces (institutionalisering), is het nodig om ook even stil te staan bij de manier waarop actoren hun omgeving en de institutionele context beïnvloeden. Onder de institutionele context verstaan we zowel de formele (wetten, regels, normen, plannen, etc.) als de informele (gedrag, waarden, etc.) instituties. We bespreken enkele theoretische institutionele perspectieven die inzicht verschaffen in de kansen en voorwaarden voor een institutionele verandering: de pad-afhankelijke benadering, de sociologische benadering, en de stromenbenadering die “*windows of opportunity*” identificeert. Uit dit overzicht onthouden we dat de voorgeschiedenis een belangrijke invloed heeft op de toekomstige mogelijkheden en op de institutionele context, maar ook dat geschiedenis niet alles bepaalt. De institutionele context kan veranderen, als de actoren er werk van maken. Niet alle veranderingen leveren echter een effectiever resultaat op, actoren hebben slechts een beperkte kennis en inzicht in hun situatie en ook culturele betekenis en gewoonten spelen een rol.

Na te hebben ingezoomd op zowel de actoren als de institutionele context, bekijken we het dynamische samenspel van beide, dat gedefinieerd kan worden als governance. In paragraaf 2.3 komen verschillende governance definities en perspectieven met betrekking tot de invulling van ‘governance’ en de rol van de overheid aan bod. Die rol varieerde in de afgelopen decennia van een sterk hiërarchische benadering, gekenmerkt door een gecentraliseerd en top-down overheidsapparaat dat de controle in de hand nam, naar een meer vrije-marktgeoriënteerde benadering, waarin de overheid zijn taak meer en meer delegeerde. In de jaren die erop volgden zocht men echter heil in een combinatie van beide, de markt corrigeert immers niet voor alles: de vele nefaste neveneffecten of milieu- en gezondheids-impact van onze handelingen, sociale inclusie, etc.

Om daarvoor te corrigeren en de handelspatronen van actoren meer de gewenste richting uit te sturen lijkt de rol van de overheid allerm minst uitgespeeld. Initiatieven die van onderuit groeien, krijgen hierbij de kans om zich te ontwikkelen en worden tegemoetgekomen door initiatief van bovenuit. Co-productie werd het sleutelwoord waarmee de governance benadering verder ging.

Maar de sterke focus op het plannen voor de middellange of lange termijn leek moeilijk verenigbaar met het complexiteitsdenken waarin onvoorspelbare zelf-organiserende processen en co-evolutie centraal staan. Om een meer complexe lezing van de toekomst toe te laten, ging men althans in het onderzoeksveld van de bestuurskunde op zoek naar een governance benadering die verder ging dan co-productie; de 'reflexive governance', de transitie management benadering en de evolutionaire governance theorieën werden ontwikkeld. Al deze governance strategieën hebben hun eigen specificiteiten en zijn inzetbaar in andere situaties. Ze kunnen in een matrix van vier "uiterste" governance strategieën bijeen worden gezet. Maar in het geval dat zowel de institutionele context als het actorenveld dynamisch is, wordt de voorkeur gegeven aan een co-evolutionaire strategie. Die zal dan ook verder vorm geven aan de orgware agenda voor mobiliteit.

In paragraaf 2.4 lieten we de theoretische inzichten in de complexiteit, de actoren of actornetwerken, en de institutionele context versmelten met een perspectief op mobiliteit dat het complexe karakter beter weerspiegelt: mobiliteit als een complex adaptief systeem (CAS). Een mobiliteitssysteem kan worden beschouwd als een CAS, binnen het grotere maatschappelijke/milieusysteem, maar ook op microniveau. Het bestaat uit verschillende dynamische onderdelen die elkaar voortdurend beïnvloeden: socio-demografische factoren, macro- en micro-economische trends, sociaal-culturele trends, de pluralisering van levens- en dus mobiliteitsstijlen, de impact op vervuiling en gezondheid, technologische en logistieke innovaties, en de impact van dit alles op het beleid. Het onderzoek naar mobiliteit is daarom steeds complexer geworden. Voor die vertaalslag namen we het mobiliteitsmarktenmodel als uitgangspunt. Dat model heeft immers oog voor alle actoren en factoren die van invloed zijn op mobiliteitskeuzes en reispatronen. Bovendien integreert het de mobiliteit in een breder maatschappelijk en milieusysteem en houdt het rekening met zowel de vraag- als de aanbodzijde van mobiliteit in. Passen we dit model toe dan bestaat het complex adaptief mobiliteitssysteem uit een verplaatsingsmarkt, een vervoersmarkt en een verkeersmarkt. Die markten organiseren zich echter niet in een leemte, maar zijn afhankelijk van middelen (energie, financiële middelen, etc.) en hebben een zekere impact op het bredere socio-technische (hyper)systeem (vb. congestie, luchtvervuiling). Elk van deze "markten" bestaat uit associaties van dynamische actorvelden die hun voorwaarden en omgeving vormgeven en erdoor worden vormgegeven. De orgware of de organisatie van zo'n complex adaptief mobiliteitssysteem, die naast hard- en software moet bijdragen aan een mobiliteitstransitie, staat voor een tweeledige uitdaging. In de eerste plaats moet de benadering van binnenuit proberen ingrijpen in de subsystemen en de netwerken van actoren zodat structurele koppelingen (*structural couplings*) ontstaan en allianties kunnen worden gevormd die de verschillende deelsystemen met elkaar verbinden. Ten tweede kan governance ook de voorwaarden scheppen die nodig zijn om deze structurele koppelingen mogelijk te maken.

De complexiteitstheorie aanvaardt geen generieke oplossingen maar zoekt naar

diepgaande, situationele kennis. Het verwondert daarom wellicht niet dat we voor ons onderzoek naar de orgware agenda van mobiliteit een casestudie methodologie toepassen om het antwoord op onze centrale onderzoeksvraag op te bouwen (cf. hoofdstuk 3). Vanuit een meervoudige casestudie analyse proberen we te achterhalen waar mobiliteitsgovernance vandaag de dag staat. We gaan in op de specifieke actornetwerken die vorm geven aan de governance van mobiliteit en welke governance benaderingen de voorkeur genieten. De casestudies worden geselecteerd uit twee belangrijke mobiliteitsgovernance innovaties of evoluties die zich de afgelopen tien jaar hebben ontwikkeld of voltrokken: de opkomst van de regionale of interbestuurlijke samenwerking voor mobiliteit en het plannen en uitvoeren van grote en complexe infrastructuurprojecten. Meer concreet, krijgt het ontstaansproces en de voorgeschiedenis van de vervoerregio's een plaats in dit proefschrift. Waarbij ook De Verkeersonderneming in Rotterdam en zijn Mobility as a Service toepassingen meegenomen worden voor analyse. Anderzijds leveren het reeds langlopende infrastructuurproject van de Oosterweelverbinding en de opkomst van georganiseerde burgerbewegingen als Ringland binnen dit debat tevens input voor de mobiliteitsgovernance in verandering. Vooraleer in te gaan op deze casestudies worden in Hoofdstuk 4 de recente evoluties geschetst van het institutionele kader dat vorm geeft aan de mobiliteitsplanning en de ruimtelijke planning in Vlaanderen. Dit luik schept tevens de context waarbinnen men de cases kan situeren.

Uit de casestudies die besproken worden in Hoofdstuk 5 t.e.m. 7, blijkt dat de governance van mobiliteit nog steeds hoofdzakelijk gericht is op het formuleren van hardware en software oplossingen vanuit een benadering gedomineerd door een infrastructuurdenken. Waarbij voornamelijk de gevestigde actoren uit de verkeersmarkt, zoals de infrastructuuragentschappen, de lokale en hogere overheden, en de traditionele openbare vervoermaatschappijen het heft in handen houden. De orgware benadering krijgt te weinig aandacht, de noodzakelijke oplossingsruimte door synergieën tussen de verschillende mobiliteitsmarkten blijft dan ook vaak klein; nieuwe actoren betrekken blijft een lastige onderneming. Nochtans tonen de casestudies aan dat waar men wel tot die synergieën komt, en actornetwerken elkaar vinden, de oplossingen veel breder gedragen zijn en dus robuuster. Hierbij kan de invloed van burgerbewegingen anno 2018 en de veranderende rol, of de veelheid aan rollen die zij op zich nemen, niet worden onderschat. Vanuit die bevindingen formuleren we een orgware agenda voor mobiliteit.

In hoofdstuk 8 wordt gekeken naar hoe een citizen science project het mobiliteitsgedrag mogelijks kan veranderen. Nog belangrijker focust dit hoofdstuk op de veranderende rol van burgerbewegingen van oppositievoerders in de marge naar protagonisten in strategische partnerschappen met overheden, kennisinstellingen en private partners. De resultaten van het CurieuzeNeuzen citizen science project van de Ringland Academie vormen hiervoor de input.

Ter samenvatting kan gesteld worden dat dit onderzoek ernaar streefde aan de hand van casestudies de huidige mobiliteitsorgware te ontrafelen, of beter nog, te materialiseren, om een orgware agenda naar voor te schuiven die mogelijkheden aanreikt voor de mobiliteitstransitie. Waar het besturen of de governance van mobiliteit vandaag de dag nog te vaak vervalt in het infrastructuurdenken of in tracédiscussies, zijn er recent wel lichtpunten die sporen bevatten van een meer co-evolutionaire governance aanpak. De cases wezen uit dat de tweeledige aanpak voor een co-evolutionaire governance van mobiliteit relevant is en een houvast biedt voor de orgware agenda.

Summary

This dissertation starts from the observation that solving mobility issues and governing mobility remain troublesome. The prevailing mobility governance approaches are still entrenched in a technocratic oriented discourse, that is strongly oriented towards hardware (i.e. infrastructural and technical) and software solutions (i.e. related to use). Those approaches, however, do not prove effective to launch the mobility transition, as they miss alignment, and either face an increasing opposition by an ever growing and empowered actor field, or, their solutions have generated undesired side-effects, that in turn developed new problems. Because of this, mobility issues, increasingly become wicked problems. Only more recently, orgware interventions, focusing on the organisational aspects (the actors, the institutions, and the conditions) are becoming part of the mobility governance scope. With orgware we mean the organisational black box that is behind mobility; behind our individual displacement patterns, behind mobility planning and decision-making, etc.

In this research, we address the orgware hiatus, by elaborating on a more systemic and complex conceptualisation of mobility. Because the current governance strategies do not fit the encountered complexity, we unravel the mobility orgware into its basic components and interrelations to propose an additional orgware agenda for mobility.

To understand how to adequately respond to the wicked mobility issues, that are inherent to a complex reality, our venture starts from the complexity theory literature in Chapter 2. Adopting the complexity perspective implies a considerable change of mind, as certainty and predictability are replaced by emergence and a-linearity. In this case, the emphasis in planning shifts from ad-hoc planning based on the here and now ("being"), towards planning for an undefined becoming (Boelens and De Roo 2014). The wicked problems generated by those dynamic interrelated parts and subsystems cannot be answered by generic formulas. Hence, situational approaches gain attention over generic ones (De Roo 2012, Jessop 1997). Thus, to grasp the complex reality, a more systemic conception of the matter is necessary; a concept that enables revealing the connections and feedback loops between parts of the system. The complex adaptive system (CAS) concept increasingly finds its way from the biology discipline towards the social sciences, and provides the systemic insights that we are looking for. A CAS is defined as a complex system that comprises many subsystems and hyper-systems or environments at multiple (scale) levels, which are all continuously self-organising in the interaction with each other and with their setting. When zooming out, to see the bigger picture, the detail of the parts dissolves and the subsystems they shape become visible. From this perspective we can observe the co-evolution processes, as the aggregate of the self-organising actor networks.

In Section 2.2, we discuss what this means for a system, regarding its components. How do mobility patterns arise? Who or what is at the basis of those patterns? First, we take an actor-centred perspective, that builds on the actor network theory (ANT) and the actor relational approach (ARA). The ANT theory presumes that actors should be perceived as parts of associations or actor networks. ANT is founded on the ideas that actors are continuously networking, and by doing so acquiring meaning (within their network). Everything has to be considered as an

actor network; focusing on either the actors or the network is a matter of zooming in or out. There is nothing but the actor network. In the quest to survive, actors form dynamic alliances with other actors that strive the same ideals, plans, objectives, etc. Actor network associations emerge from those continuous interactions (“self-organising” processes). ANT and ARA identify four phases in this actor networking, the “translations”: problematisation, interessement, enrolment, and mobilisation of allies or institutionalisation. The ARA approach, specifically addresses the role of spatial planners in this translation. ARA, therefore refines those four steps into seven, and even formulates a step towards the future beyond the plan; developing a regime and shaping an associative democracy. ARA further stresses the importance of a mixed actor network association in which strategic partnerships between the civil, public, business and knowledge sector are strived for. As actors eventually want to get their views or actions institutionalised, i.e. adopted and facilitated by formal and informal sets of rules, plans, etc. we conduct a brief inspection of the institutional theory perspectives.

Second, the institutional layer is elaborated. Everything has meaning within and thanks to its specific context, decisions are never taken in a vacuum, and history matters. Institutions are defined as ‘collections of rights, rules, principles, and decision-making procedures that give rise to social practices, assign roles to the participants in these practices, and guide interactions among the participants’ (Young 2017: 27). We discuss several institutional theories or perspectives that concentrate on opportunities and conditions for institutional change: the path dependent, the sociological, and the institutional change perspective conceptualising windows of opportunities. From this brief review, we extract that history matters for the future course of institutions, but that history does not determine everything. Institutions can change, if the actors decide so. However, not all change necessarily implies a more effective outcome, as people only have bounded rationality, and cultural significance and habitual behaviour play a role as well. What remains, after having discussed how to perceive the actors and the institutions, is the elaboration of their dynamic interplay, that is called ‘governance’.

In Section 2.3 We discuss prevailing perspectives on the interpretation of “governance”, and the role of the government in it. The public administration paradigm, the new public management, and the new public governance form the starting point.

Past governance approaches ranged from a strongly top-down centred government in the public administration paradigm (70’s and 80’s), to a free market oriented new management paradigm (90’s). From 2000 onwards, hopes were pinned on a combination of both in the new public governance paradigm. Since the top-down approach did not always deliver the desired results, governing inclined towards the other extreme; the free market principle. The associated co-production concept was seized as an opportunity for PPS. But, the predominant co-production concept of that era soon eroded to managerial contracting practices, and became a shadow of the strategic partnership between public and private it once had envisioned. As mentioned, in response, the new public governance paradigm emerged, combining elements of both previous paradigms. The interpretation and reputation of co-production was restored. However, as this approach appeared very time-consuming, it soon drifted off from real co-production to only involving the vested actors. Besides, those governance approaches still focus on working towards a fixed

goal, though oriented on the longer term. That fixed goal is something difficult to accept when acknowledging the complex nature of the real world. Striving for a fixed goal does not account for self-organising processes by actor networking associations. Those processes lay at the basis of how actor networks come into existence, and how actors influence and are influenced by their environment and institutional setting (cf. Section 2.2). As an answer, affected by complexity theories, the reflexive governance, transition management, and evolutionary governance theory were developed, adding co-evolutionary aspects to governance. They conceptualised how governance arrangements could change or (co-)evolve over time. When combining those former perspectives with the new one, one can come up with a matrix of four governance approaches. They can be differentiated according to the way they perceive the actor field and setting cf. in Figure 95. It is this co-evolutionary approach that we focus on, for our complexity embracing orgware agenda for mobility.

In Section 2.4 we merge the theoretical insights regarding complexity, actors or actor networks, and institutions with a complex adaptive system's makeover of mobility. The multi-market mobility model serves as the starting point for that fundamental orgware approach. The model has an eye for all aspects influencing mobility choices and travel patterns, and it embeds mobility in a broader societal and environmental system. By integrating both the supply and demand side of mobility, the model fits within the "new realism" paradigm in mobility planning. The mobility system or CAS of mobility comprises a travel market, a transport market, and a traffic market. Those markets do not act in a void, but are depending on resources and exert a certain impact on the broader socio-technical (hyper-) system. Each of those 'markets' consist of dynamic actor network associations shaping and being shaped by their conditions. A mobility system can be regarded as a CAS, within the greater societal/environmental system, but also on micro-level. It consists of various dynamic features influencing each other continuously: socio-demographic factors, macro- and micro-economic trends, socio-cultural trends, the pluralisation of life- and subsequently mobility styles, the impact on pollution and health, technological and logistic innovations, and the respective policies. Researching mobility has therefore become increasingly complex.

In a CAS context, a co-evolutionary governance aims at realising or facilitating two main objectives. First, from an inside perspective, governance should intervene in the subsystems and its actor networks, so that structural couplings and alliances can be forged. Second, from an outside perspective, governance can shape the necessary conditions to allow these structural couplings to happen. We are not only interested in the actors or the conditions, but also in their interactions. Those interactions relate to the actor's or subsystem's governance paths. The co-evolutionary governance framework we propose is twofold. First, governance answers to mobility issues are screened and examined with respect to the rise of structural couplings within the actor network translation phases (if? How?). Second, the conditions or the object of planning is analysed to identify where windows of opportunities have opened up.

As a complexity framework strongly encourages in-depth, situational knowledge, it might not come as a surprise that the we conduct a multiple case study analysis to find the answer to our research question (cf. Chapter 3). A multiple case study

analysis is carried out, to see where mobility governance stands today, on the subject of acknowledging complexity and adapting the orgware. Evidence is gathered from mostly Flemish mobility governance case studies. The cases are selected from two major developing governance processes over the last decade: regional intergovernmental mobility cooperation, and the planning and implementation of large infrastructure projects.

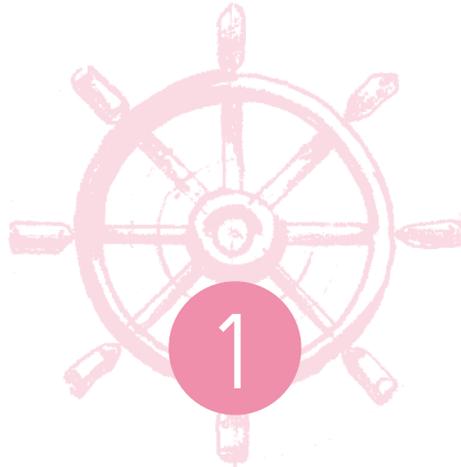
The cases, discussed in Chapter 5 to 7, show that the present mobility governance still mainly focuses on hardware and software solutions from an infrastructure oriented perspective; the traffic market rules the game. The main players in the traffic market, such as infrastructure agencies, local and regional authorities, and the traditional public transport companies, take the lead. Looking at mobility in a more systemic way, extending the scope for solutions from the traffic to the transport and the travel market, while leaving room for new actors, is rare and deserves more attention. The case studies show that where the scope for solutions or the complex adaptive mobility system is fully taken into account, and where structural couplings are established between the actor fields and the mobility markets, the formulated mobility solutions are more robust and more broadly supported. The role of citizens movements and the changing role or multitude of roles they assume cannot be underestimated. On the basis of these findings, we formulate an orgware agenda for mobility.

Chapter 8 elaborates on how a citizen science project can stimulate or trigger a behavioural change, not only with respect to their modal choices, but also regarding their attitude towards certain mobility policy measures. More importantly, the chapter focuses on the changing role of citizen movements from mere activist groups in the margin towards protagonists in strategic partnerships with governments, knowledge institutions and private actors. The results of the CurieuzeNeuzen citizen science project by the Ringland Academy delivers the input for this chapter.

In summary, this research aims to unravel the current mobility orgware on the basis of several case studies in order to come to an orgware agenda necessary to move forward in the mobility transition in an effective and efficient way. Whereas mobility governance still too often lapses into mere infrastructure thinking or into route discussions, more recently, traces of a more co-evolutionary approach could be cautiously spotted. The cases showed that the dual approach for a co-evolutionary mobility governance is able to identify the bottlenecks in the current mobility planning and enables us to formulate an orgware agenda. The dual challenge that is at the heart of such co-evolutionary approach is not only to achieve structural couplings between the actors and the mobility markets, but also to align the institutional setting to support and initiate these couplings. Governance should be devoted to a two-tiers approach: forging structural couplings between the actor networks and subsystems, and intervening in the conditions to facilitate such couplings. This approach aligns with the new realism in mobility and offers insights in the gaps of current policy interventions. It traces the basic building blocks: the mobility actors and their actor networks. It re-associates the diverse markets and policy fields spatial planning and mobility. It addresses both demand and supply side of mobility,

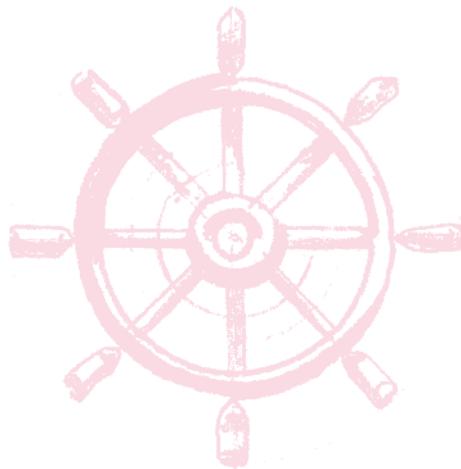
and this within all three mobility markets; it addresses their associated conditions, thereby acknowledging the interplay between those markets.

In summary, this research aimed to unravel, or even materialise, the current mobility orgware by means of case studies, in order to assemble an orgware agenda that highlights the challenges and offers possibilities in the transition towards a more sustainable mobility. Whereas the governance of mobility often still lapses into infrastructure-oriented thinking, recently, traces of a co-evolutionary governance approach could be identified. The dual approach for a co-evolutionary governance of mobility proved relevant and practical as the basis for an orgware agenda.



1

Attention to
governance,
please?



The thesis' title "the art of governing in the complex mobility transition" speaks for itself. Several main theoretical themes can be distilled. First, the art of governing, hence governance, will be examined. By presenting it as an art, the fragility is suggested of the governance ambitions and the tailor-made products resulting from that. Nowadays, governance has increasingly become a common concept and is used in ambiguous ways. Often, in business contexts, it refers to corporate governance, as "the framework of rules and practices by which a board of directors ensures accountability, fairness, and transparency in a company's relationship with its all stakeholders (financiers, customers, management, employees, government, and the community)"¹. However, in this contribution we specifically intend the institutional governance concept that captures the steering of multiple actors, institutions, and systems, that are structurally coupled and that exert a mutual influence (Jessop 1997: 111). It comprises "steering collective behaviour toward desired outcomes and away from undesirable outcomes" (Young 2017: 26). Second, the title acknowledges the complexity of the real world, in which absolute steering is a delusion. But what do we mean by complexity, a complex system, or even a complex mobility system? Do complex systems allow to be steered at all? And in which direction? Are transitions possible? The quote below illustrates that the need for looking into the governance hiatus has been proclaimed by Jessop many years ago.

Further steps on a research agenda might include questions about institutional embeddedness or about institutional governance, i.e., the governing of institutions and inter-institutional relations and their systemic environments. (Jessop 2001: 1221)

1.1

Mobility issues are "wicked" problems

[...] every plan, every treatment of a wicked problem is a venture, if not an adventure. (Rittel 1972: 395)

More and more, social transitions, and thus also mobility transitions, have become wicked issues as the result of an increasingly dynamic and complex real world (Kemp and Loorbach 2006), correspondingly they require more complex governance mechanisms and decision-making processes than was previously the case. But why are mobility problems wicked, and why is governing mobility often complex?

According to the Oxford dictionary "wicked" means (1) *evil or morally wrong*, (2) *intended to or capable of harming someone or something*, and (3) *(informal) extremely unpleasant*. Sometimes, in informal way, it can also be used as a synonym for "excellent". The last more informal meaning is interesting in combination with the word "problem", because the outcome then becomes an excellent problem.

1 Description from <http://www.businessdictionary.com>

4. **Mobiliteit**
“Overkapping niet ten koste van Oosterweel”

“Al 135 miljoen weggegooid in Oosterweeldossier”

Rekenhof over Oosterweel: “Nu worden enkel de consultants en advocaten rijk”

CD&V vraagt nieuw debat over Antwerpse mobiliteit

CD&V: “We hadden sneller met Ringland moeten gaan praten.”

Bam wil Ringland

BAM wil Ringland als alternatief laten onderzoeken

Districtsraad wil gesprek overkapping

Nieuwe tegenslag voor Uplace: wordt ruimtelijk uitvoeringsplan vernietigd?



wo 10/05/2017 - 09:14 **Ilco Saetens**

Er dreigt een nieuwe tegenslag voor het geplande winkelcomplex Uplace in Machelen. De auditor van de Raad van State adviseert namelijk om het ruimtelijk uitvoeringsplan te vernietigen, zo schrijft De Tijd. Zonder dat plan kan het project er niet komen. Uplace zelf blijft strijdvaardig.

Van Essers tot Oosterweel:

Waarom de ‘lastigaards’ zullen blijven komen

Tot ergernis van de overheid procederen steeds meer burgers en milieuverenigingen tegen haar beslissingen. Die trend zal nog toenemen, zegt milieujurist en advocaat Hendrik Schoukens. Een verhaal over Essers, Oosterweel, Saetfinghe, Uplace en de Klimaatzaak. En over rivieren die rechten krijgen. **DOOR DIRK DRAULANS, FOTO MARLEEN DANIELS**

Figure 1 Headlines demonstrating that current (spatial or mobility) planning projects in Flanders are a wicked endless Calvary, left: Oosterweel Link Project (<http://www.ademloos.be>); upper right: setback of Uplace project (<http://deredactie.be>); bottom right: opinion on various complex projects (Draulans 2016).

We use the term ‘wicked’ in a meaning akin to that of ‘malignant’ (in contrast to ‘benign’) or ‘vicious’ (like a circle) or ‘tricky’ (like a leprechaun²) or “aggressive” (like a lion, in contrast to the docility of a lamb). We do not mean to personify these properties of social systems by implying malicious intent. But then, you may agree that it becomes morally objectionable for the planner to treat a wicked problem as though it were a tame one, or to tame a wicked problem prematurely, or to refuse to recognize the inherent wickedness of social problems. (Rittel and Webber 1973: 160)

Thus, wicked problems are persisting; they can be defined as problems that generate new problems, while trying to solve the first ones. Those problems are

2 ‘(in Irish folklore) a small, mischievous sprite’ (cf. Oxford Dictionary, <https://en.oxforddictionaries.com/definition/leprechaun>).

multifaceted and are subject to a continuously changing (and uncertain) setting of which conditions frequently change and sometimes become contradictory (Rittel and Webber 1973, Kenis and Provan 2008).

Some mobility or transport problems are wicked problems. For instance when roads are congested, a possible and often considered solution is to provide more lanes to these roads. After a while, the roads become congested again, or other roads will become, as people start filling the gaps (the added infrastructure capacity). That phenomenon is referred to as the law of peak hour congestion or induced traffic as posed by Downs (1962) and documented by, amongst others, Duranton and Turner (2011) and Litman and Colman (2001). As such, the solution to the problem has generated other problems in turn.

As policy-makers struggle to find effective solutions, mobility issues can be regarded as wicked: the solution(s) involve various actors and policy fields, and have to fit ever-changing conditions. Over the years, mobility – and especially car-mobility – traffic flows have increased and intensified (Geerlings 2012, Akerman, Banister et al. 2000, Chapman 2007). The foundation of the intensive mobility, transport, and communication patterns that we experience today are the result of the complex network society we live in. Mobility can be mainly considered as a derived demand, since it is or often has become a necessary medium to participate in economic and social life. But regarding this mobility, it seems that we have been locked into a “system of auto mobility” from which it is particularly hard to break free (Urry 2004). As a result, the daily mobility infarct on the principle road network remains a structural problem. The necessary transport-related emission reduction levels to mitigate climate change and ensure environmental health are still out of reach. Although there has been put effort in the adoption and implementation of clean vehicle technologies being responsible for a relatively small decrease of emissions, the continuing rise of car use and travelled kilometres per person is wiping out this effect (Chapman 2007, Dray, Schäfer, and Ben-Akiva 2012). Additional to structural congestion, air quality and noise quality standards are exceeded frequently as well, especially in and around cities (Geerlings 2012: 12, Bertolini 2012, Chapman 2007).

When planning for infrastructure or mobility projects, governments and project developers become increasingly entangled in wicked problems. They often become headache portfolios for politicians (cf. Figure 1). As a result of a strong fragmentation over the years, it is not only a challenge to align the governmental departments and branches at multiple scale levels, and resist or adapt to internal pressures during the planning process. But also from the outside, pressure is exerted; due to globalisation and ongoing empowerment, an increasing number of citizens and new stakeholders arrive at the (mobility) planning scene. Consequently, the role, expectations from, and position of the government in steering mobility is exposed to internal and external pressure. Furthermore, decisions and innovations in other policy and socio-technical domains influence the wickedness as well. Mobility is often a derived demand and is to be situated in a broader socio-economic system (Banister 2008). Planning mobility should thus logically integrate these highly interrelated domains of the socio-economic fields (Banister 2008, Nykvist and Whitmarsh 2008, Rajan 2006, Bertolini 2012). At the one hand, the continuing

growth of mobility patterns serves our economic welfare, but at the other hand exerts major negative impact on local and global environments, quality of life, and paradoxically on the economic prosperity of cities and regions (e.g. due to congestion) (Geerlings 2012, Banister 2008). Nevertheless, an integrated approach spanning at least the fields of spatial planning and mobility, has not yet seen the light. It is not a coincidence that we address mobility issue here, from a (spatial) planner's perspective. Since spatial planning can be considered a natural site to integrate various (often sectoral) policies that are impacting an area (Van Assche and Verschraegen 2008).

In summary, the ongoing increase of mobility patterns cannot be reversed quickly. The hardware and software solutions dealing with it, proved to be insufficient. Furthermore, the consequences of the intensification go beyond the field of mobility alone: a more systemic approach of mobility is needed.

In the transition literature in particular, various systemic frameworks have been discussing the governance concept. In such frameworks, transitions or innovations are conceptualised as a multi-layered socio-technical system in motion, consisting of multiple interconnected parts (human and non-human, or respectively social and technical) and feedback loops. Various concepts elaborate on how such systems can change or develop over time. For instance, the reflexive governance concept focuses on how governance arrangements themselves can evolve and adapt over time to fit the dynamic actor field and complex setting. The transition management research, with its multilevel perspective, relates to this reflexive governance and focuses on attaining the necessary change by zooming in on the multiple layers and their roles. Furthermore, there is the Evolutionary Governance Theory (EGT), linking notions of change in social systems theory and institutional theories to governance paths, therewith also referring to the notion of path dependency and interdependence. These concepts and theories start from the ever-growing conviction that sustainability issues are systemic and complex in nature. Consequently, they produce wicked problems, for which a solution has to be sought in different and multiple directions. As this systemic conception is central to our view on mobility, we will pay attention to complexity theories and systems theories further on as well.

1.2

Towards new perspectives in mobility planning

The planning approaches that prevailed hitherto in the mobility practice are predominantly hardware and software oriented, often considering the supply side of mobility. Hardware interventions relate to changes made regarding the solid matter, the equipment, the technical part of mobility. Software measures intervene in the use of that solid matter (e.g. smart traffic light programs, ITS, mobility apps, and GPS systems) (Dobrov 1979).

However, an additional orgware³ approach is still missing; an organisational approach or thus governance that attunes the different hardware and software initiatives, so that mobility initiatives, institutions, etc. in various fields do not counteract but strengthen each other.

People began to speak of mobility instead of transport or infrastructure planning, as mobility not only involves more than the infrastructural layer, but also more than transport. While transport is defined as “a system or means of conveying people or goods from place to place” (<https://en.oxforddictionaries.com>), mobility includes more. Mobility refers to “the ability to move or be moved freely and easily” (<https://en.oxforddictionaries.com>). This places the mobility consumers or actors more centrally and implies certain preconditions.

In this light, managing the demand side became part of mobility planning as well. This is often referred to as the “new realism” in mobility planning. The idea arose that it was necessary to curb the travel need by measures oriented to attain a behavioural change by location policy initiatives (integration of mobility patterns with urban planning), by offering more comfortable and often economic options to commuters, and by increased use of ICT (Nykqvist and Whitmarsh 2008, Rajan 2006, Schwanen, Banister, and Anable 2012).

Hard and software solutions are introduced in both the supply and the demand side of mobility. A hardware solution on the supply side is for instance the installation of smart traffic lights, or the provision of an extra lane (to increase the capacity of the road. The traffic lights, can be seen as a software measure as well as they have an influence on the use of the infrastructure (or the hardware). On the other hand, we can take the parking policy and parking tariffs of a city as an example of a hardware intervention targeting the demand side, as it gives the incentive to park further away from the city centre or to choose alternative transport modes. Other examples that are sometimes simultaneously both hard- and software are the high occupancy vehicle (HOV) lanes that are reserved for carpooling people. The low emission zone (LEZ), which restricts/permits the accessibility to a certain city area according to the emission standards of the user’s car is also an example of a measure that is both hard and software, and rather oriented towards the demand side of mobility. But still, there was no sign of an additional and engaged orgware approach, aligning all those initiatives or ideas.

Instigated by the Brundtland report in 1989, launching the sustainable development concept (cf. Brundtland report, 1989), the sustainability banner was rapidly adopted by many research and policy fields, no different for mobility. A sustainable mobility definition was derived from that general sustainable development concept.

3 We define ‘orgware’ as the organisational aspects, as a set of organisational arrangements integrating actors or initiatives, and institutions to support the appropriate interactions. We based this definition on the work of Dobrov, but translated it from its rather technological background to a social one (based on Dobrov 1979: 79,81). “To achieve success in putting each modern technological system into operation a specially designed organization is of great importance. This organization has to provide the necessary conditions for the utilization of decision makers’ skills and the interaction of this system with other systems of different natures. We named this system Orgware” (Dobrov 1979: 81).

Accordingly, sustainable mobility delivers on the following aspects:

(1) allows the basic needs and development of individuals, companies and societies to be met safely and in a manner consistent with human and ecosystem health, and promotes equity within and between generations; (2) is affordable, operates efficiently, offers choice of transport mode, and supports a vibrant economy, and regional development; and (3) limits emissions and waste within the planet's ability to absorb them, uses renewable resources at or below their rates of generation, and, uses non-renewable resources at or below the rates of development of renewable substitutes and minimizes the use of land and the generation of noise. (European Commission Joint Expert Group on Transport and Environment 2000, as in Hull 2008: 95)

A sustainable mobility paradigm was developed, offering a new perspective, opposing the conventional (and car-centred) mobility paradigm. Meanwhile, a few other mobility paradigms such as “smart mobility” and place-making approaches were steadily developing, but all in a quite separate fashion.

Traditionally, in the conventional mobility paradigm, more attention is paid to predominantly hardware, and software measures (endorsed by the rapidly booming multimedia and ICT developments). In case of traffic congestion, the lacking capacity could be calculated or predicted and provided (predict-and-provide). That is why the conventional approach has often been compared with a technocratic or an engineering approach, (Bertolini, le Clercq, and Straatemeier 2008: 69, Hull 2008: 94). The approach relies on ideas of manipulability, forecasting, and modelling future mobility scenarios to provide the solution to mobility issues. Though in the more technological field of applied systems and management, it has been argued that one needs the interplay of hardware, software, and orgware components to facilitate an innovation or transition (Dobrov 1979), we had to wait for the sustainable mobility paradigm to detect a first trace of an orgware agenda in mobility planning. The switch away from the outpaced, technocratic conventional mobility paradigm was called the “new realism” in transport planning (Hull 2008, Urry 2004). It casted the (theoretical) shift from mainly supply-side towards demand-side oriented; the first steps of a behavioural change agenda could even be identified.

The sustainable mobility paradigm, introduced by Banister (2008), proposes such a (theoretical) new realist response to the conventional mobility approach, since the latter has not enabled a more sustainable mobility pattern (Marshall and Banister 2000). As a response, Banister conceptualises a comprehensive paradigm to get to a more sustainable mobility. That paradigm focuses on four pillars: (1) reducing the travel need, (2) aiming for a modal shift, (3) reducing the distances by land-use policy measures, and (4) technological innovation for an efficiency increase and a reduction of the environmental impact. Cities are considered the most sustainable urban form of development, as they combine well-designed, diverse, and dense urban environments, so that the accessibility and the availability of an efficient and high quality public transport can be guaranteed (Banister 2005). The third pillar,

reducing the distances, refers to the aim of the sustainable paradigm to narrow the current disconnect between spatial planning and mobility planning. Interestingly, Banister argues that there are already enough options and policy measures to acquire a more sustainable transport pattern. The necessary conditions for change, however, are still lacking. In addition to the importance of a high-quality implementation of innovative schemes, he thus emphasises “the need to gain public confidence and acceptability to support these measures through active involvement and action” (Banister 2008: 73).

Apart from the focus on public support and social aspects, environmental, health, and quality of life aspects formed the focal points of the paradigm (cf. emission reduction and associated strategies, LEZ, congestion charges, etc.)(Banister 2008). The economic aspects of mobility, such as the negative externalities and impact of traffic on the environment, are taken into account as well. Though the sustainability banner was often used in the mobility planning practice, the paradigm somewhat eroded and became mainly associated with the environmental impact of transport, dominated by the decarbonisation agenda of transport (van Lier and Macharis 2015). The social aspects were gradually dropped (Jeekel 2017).

‘smart cities’ is a term denoting the effective integration of physical, digital and human systems in the built environment to deliver a sustainable, prosperous and inclusive future for its citizens. (BSI 2014: 3)

Not much later, the sustainable agenda became complemented by the smart mobility concept, in which salvation was sought in technological innovations for cars and in infrastructure management (optimizing cost- and time-efficiency of the infrastructural capacity). The idea appealed that, for instance, the necessary carbon reduction could be achieved with a minimal effort and interference to the personal (modal) choices, and thus without upsetting current practices of mobility (cfr. Marsden, Mullen et al. 2014: 74). Note that the decarbonisation agenda was still concentrated on. Smart mobility, was a rather vague concept, that was often linked to the smart cities concept. Although it has not been widely introduced in the academic literature, the term “smart” soon became inserted in the mobility planning vocabulary and was adopted by the mobility planning practice⁴. Jeekel (2017: 4297) argued that the concept embraced a more active⁵ perspective on mobility issues and solutions, and that it was therefore received with great enthusiasm in business and public circles. Although sustainability and multimodality were often claimed important by decision-makers, car-mobility improvements have been favoured at the expense of other modes (Litman 2013, Papa and Lauwers 2015, Joss 2016).

[...] a significant motivation for looking to technological development and its adoption was the idea that in this way carbon reduction can be achieved with minimal interference to the range of choices available to people and without upsetting current practices of mobility. (Marsden, Mullen et al. 2014: 74)

4 We therefore we chose to talk about it as a concept, rather than a paradigm

5 We use the term active to refer to the pragmatic character of the smart mobility approach, and to the action-driven perspective; it seems to offer concrete solutions (often data- and technological driven).

The initial conceptualisation of the smart cities or smart mobility paradigm included more than only the data and technology part enhancing network capacity and management, as shown by the BSI definition on smart cities (see quote). But in practice it often did not reflect more than the faith in the technological fix. Consequently, the smart city paradigm was criticised for the lack of the human side to the story. The critiques reflected the missed opportunity to link the smart technologies with the sustainable and place-making approaches in which quality of life aspects and spatial planning are much more central. The smart city paradigm was even said to be not more than “an evocative slogan lacking some fundamental connection with other central aspects of mobility planning and governance” (Papa and Lauwers 2015: 543). Yet, some argued that the smart concept had been wholeheartedly embraced by politicians and became “a catch-phrase bereft of much precise conceptual meaning and, thus, susceptible to diverse interpretations and superficial practice” (Joss 2016: 1). It must be noted however, that in the meantime, many cities have broadened or supplemented the smart approach to some extent with elements of the other approaches as well, accounting for sustainability and aspects regarding quality of life.

Besides, the implementation of new technological developments (cleaner vehicles, electric vehicles, etc.) often requires considerable investments in new infrastructures as well, and, growing evidence shows that even the most optimistic future scenarios of technological implementation will need additional efforts and behavioural change to achieve emission reduction goals (Anable, Brand et al. 2012: 130, Banister 2008, Chapman 2007, Dray, Schäfer, and Ben-Akiva 2012, Geerlings 2012, Schwanen 2016). Furthermore, focusing the approach on providing for additional infrastructure is not always desirable, as apart from the scarcity of open space, this extra capacity can even induce more traffic, as said before (Litman 2007, Gorham 2009, Litman and Colman 2001, Downs 1962). Besides, if some of us were still clinging to the conviction that technology would fix it all, the recent diesel gate⁶ provided an abrupt wake-up call.

Since the 1990s, amongst many social science disciplines, planning gained interest in place-making approaches (Friedmann 2010). The place in place-making “provides the conditions of possibility for creative social practice. Place in this sense becomes an event rather than a secure ontological place rooted in notions of the authentic. Place as an event is marked by openness and change rather than boundedness and permanence” (Cresswell 2004: 39). The renewed interest in the “city as a place” refers to previous evolutions in the field and practice of urban design. This paradigm re-engaged with the smaller scale, with the local ecologies or networks; the diversity of the neighbourhoods and the complex dynamics behind it (Papa and Lauwers 2015). It offered a bottom-up, collaborative design approach that exhibited an admiration for the functioning of the old city as a system of organised complexity, that opposed the modernist urbanist agenda. Public safety, spatial quality, and diversity of the of urban (public) places were especially addressed (Jacobs 1961: 60-61).

6 Large-scale emission scandal in the auto construction world

Many scholars, however, kept following and elaborating the sustainable mobility concept and placed hopes in the transition management approaches (Nykvist and Whitmarsh 2008, Schwanen, Banister, and Anable 2012). While more recently critical voices raised a renewed interest in the social dimensions of mobility (Macharis and Keseru 2018), and the re-embedding of mobility and its socio-spatial context and planning (Kębtowski and Bassens 2017). The behavioural change agenda in mobility could also be situated in that re-engagement with the social dimension. It engaged with the various individual and habitual factors that influence mobility and modal behaviour. The recent comprehensive efforts to measure the influence of lifestyles on travel behaviour proves this. For instance, when targeting specific mobility consumer groups, such research provides useful information for policy making and evaluation (Van Acker, Goodwin, and Witlox 2016, Van Acker 2015, Van Acker, Mokhtarian, and Witlox 2014, Jones, Pykett, and Whitehead 2013).

Yet, despite an increased knowledge and evolving mobility planning paradigms and concepts, not much of the necessary mobility transition has been realised. Urry would even state that we have ended up in the system of “auto-mobility”. But he sees opportunities to evolve onto a “post-car system” by adopting approaches that try to consider mobility in a systemic whole of material and immaterial aspects, modes and their development, institutions and attitudes, rules and regulation, policies and politics (Urry 2004).

How do you change the paradigm that has locked public administrations into catering for public expectations of car penetration and speed of access in the belief that new road infrastructure and improved economic performance are somehow connected? (Hull 2008: 96)

The government was traditionally expected to take the front-runner position in launching the mobility transition (Hull 2008). Its role was investing in technology and curbing the travel demand to safeguard quality of life and economic prosperity, to reduce (transport-related) air and noise pollution levels and to maintain and update the infrastructures to the present needs. But mobility policy in general, and Flemish mobility policy in particular, lacked a clear and coherent discourse on how to attain the stated policy objectives for 2020 and beyond (Rajan 2006, Schwanen, Banister, and Anable 2012, Boussauw and Vanoutrive 2017). Though mobility planning can show some success stories, in general, mobility problems seem to aggravate and are subject to challenges from the in- and outside (Nykvist and Whitmarsh 2008, Schwanen, Banister, and Anable 2012, Rajan 2006, Gössling and Cohen 2014, Marsden, Mullen et al. 2014). Take Uber for instance, the initiative that is competing with the highly formalised taxi-sectors worldwide; Or the numerous upcoming bike-, car-, trip- and park-sharing initiatives; not to mention the driverless cars with their legal implications. Who is responsible in case of an accident? Are the systems reliable? Furthermore, the mobility planning scene comes across civic groups that are challenging traditional path dependencies with an increasing civil support base. To overcome these diverse challenges of the growing actor field, from the in-and outside, there is a need for new dynamics in the field of mobility. Those dynamics are not only to be expected from governments, but also other actors such as citizen movements or business actors have to take their responsibilities. In that respect

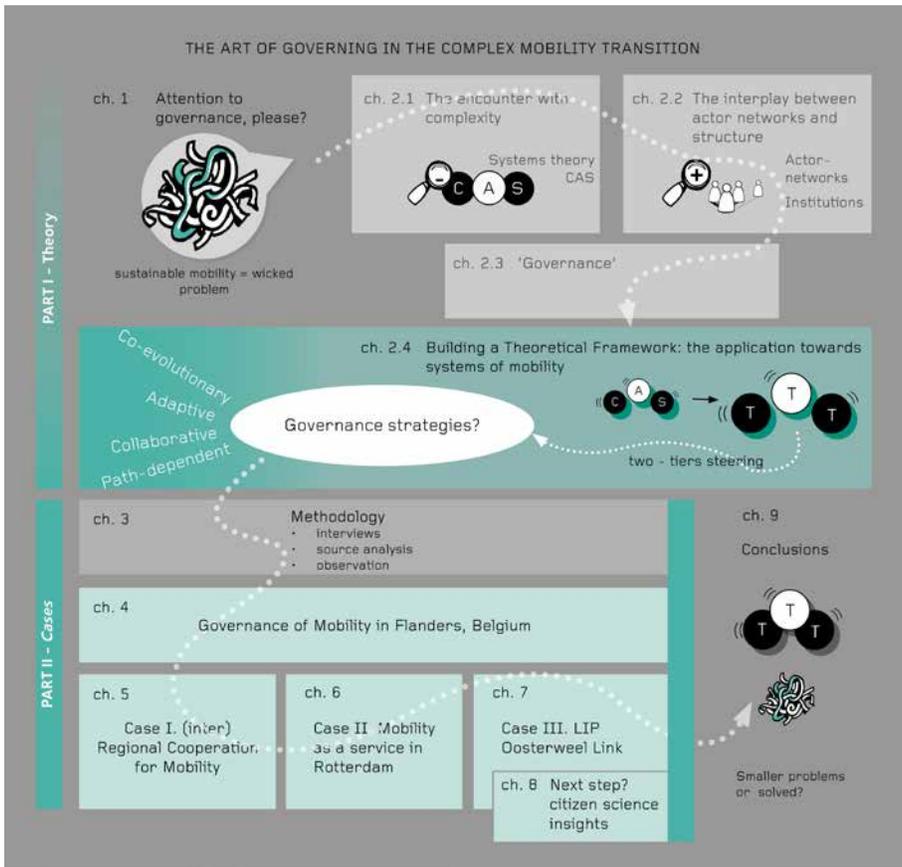


Figure 2 Dissertation outline

bottom-up or outside-in initiatives can be regarded as the key to real change. In our opinion without a severe look into the orgware of mobility, aligning the efforts of those multiple actors in the field of hardware, and software, will not break the (car) mobility deadlock.

1.3

Outline and research questions

The previous section shows that orgware aspects of mobility governance have remained underexposed. Solutions to the wicked mobility problems were sought in hardware (infrastructural, technical, solid matter) and software (regarding use) interventions. But those “quick fixes” in turn generated new problems, as our mobility patterns (and behaviour) were not that predictable as we had expected. Accordingly, a fundamental orgware approach must be faced. In this research, we elaborate on the conceptualisation of mobility as a system consisting of various components. We intend to unravel the mobility orgware to answer the central research question: **What can an orgware agenda add to hard- and software solutions tackling de complex mobility transition?**

To answer that central research question, a research framework was devised with several subquestions, relating to the different chapters or sections of this dissertation. Step by step, by answering those subquestions, we build our answer to the central research question. We elaborate and propose a conceptualisation of mobility to overcome the problems and gaps that confront and upset present mobility governance strategies. Afterwards, we apply the new conceptualisation to the real world mobility planning practice, by conducting a multiple case study research. The outline of the dissertation is illustrated in Figure 2, and described in detail below.

Chapter 2 takes us through the literature. Section 2.1 introduces wicked problems in relation to complexity and the complexity theories, and proposes a way to conceive mobility in a more systemic way, so that we can visualise and unravel the orgware. The chapter answers the questions what it means to embrace complexity. What does it imply if we considered mobility issues as wicked problems with an inherently complex nature? The complex adaptive system concept inspired us to answer this question.

a Why are mobility problems wicked, and why is the mobility transition complex?

Section 2.2 unravels the mobility orgware in its components: the actors and the setting or the conditions. We want to take an actor-centred perspective and therefore dig into the actor network theories and the actor relational approach (ARA). Furthermore, we develop a notion on how the setting is both shaping and shaped by those actors. Hence we let institutional theories shed light on path dependent processes, but show possibilities for institutional change. Questions that are addressed in deal with the perception of mobility orgware and its decisive, underlying elements. Who or what are the actors – or players of the game? What does the structure – or rules of the game– looks like?

b Who is at the basis of a transition in mobility?

Section 2.3 deals with governance and how governance arrangements can change over time. After having explored many definitions, we define our interpretation of the concept. We continue with a reflection on the evolving perspective on governance in the recent past. Furthermore, we look for concepts or theories that have been developed specifically to allow thinking of changing governance mechanisms over time. The reflexive governance concept, the extensive body on transition management theories and the concept of evolutionary governance theory are discussed in this respect. We clarify on the prevailing governance strategies and how they relate to the orgware components that were presented in Section 2.2. At the end of the section we should be able to answer questions about the meaning of governance, and the different governance approaches that can be distinguished.

c What is governance, and which governance strategies are applied?

Section 2.4 translates the screened concepts from the previous sections to the field of mobility, to build a conceptual research framework for the orgware agenda of mobility. That framework has been previously published as Van Brussel, Boelens, and Lauwers (2016). We start from systemic schemes or conceptualisations of mobility to refine and work towards an appropriate orgware framework in which the co-evolutionary governance approach receives most attention, as that approach embraces complexity. The multi-market mobility model (Egeter and van de Riet 1998, Lauwers and Allaert 2013) serves as a starting point for a co-evolutionary CAS approach of mobility. We confront the found answers and orgware elements with the selected mobility schemes, to answer the following subquestion.

d How does a co-evolutionary governance approach looks like?

The answer results in a twofold challenge or a two-tiers approach that intervenes in both the actor field and the conditions to overcome both internal and external challenges. After operationalising this challenge or two-tiers theoretical framework we should be able to answer

Chapter 4 delivers on the methods suitable for operationalising and testing the framework. Because everything acquires meaning or relevance by its context, and because of the complex nature and the suggested actor-centred approach, we conduct a multiple case study analysis. Evidence is gathered from mostly Flemish mobility governance case studies. However, the findings can be of interest for research on the governance of mobility elsewhere. We test the two-tiers approach by reconstructing the actor network stories and their structural couplings, and by elaborating on the associated institutional context to answer the following subquestion

e What does the orgware of the case studies learns us about the used governance strategies? Which are the challenges for a co-evolutionary approach with respect to the two-tiers framework?

Before discussing the case studies, we need to spend a few words on the Flemish mobility planning discipline and its evolutions in the past decades. Chapter 4 describes the evolutions of the mobility planning tradition, in Flanders, Belgium. We list the major developments in spatial planning and transport planning relevant for our orgware agenda. As such, we can detect the early roots for the disconnect between spatial planning and mobility in Flanders. It also enables us to see the governance approaches change over time, accompanied by their planning instruments and decrees. Against that background, the cases must be regarded.

We selected cases from two major developing governance processes over the last decade. In Chapter 5 we discuss the establishment of interregional mobility cooperations. We tell the story of setting up a mobility platform in the southeast of Antwerp (MOZO). We continue by how that case has fed the transport region discussion not only in general, but also particularly in Mechelen. Chapter 6 elaborates on the entrepreneurial governance strategy, introducing the market principle in mobility. We concentrate on De Verkeersonderneming Rotterdam and its

real world MaaS application. For a final case, Chapter 7 examines the still ongoing but increasingly wicked large infrastructure project process of the Oosterweel Link and the input delivered by citizen movements as Ringland. For each case we look at challenges with regard to the two-tiers approach of structural couplings and condition planning. We try to determine the opportunities and weaknesses of the adopted planning approaches. In Chapter 8, we make a detour along an interesting spinoff in the Oosterweel Link case: the citizen science project *Curieuzeneuzen*, launched by the Ringland Academy. We report on the findings, strategies of, and strategic partnerships enabling the *Curieuzeneuzen* project, a large-scale citizen science project analysing the ambient air quality in Antwerp.

Chapter 9 presents the main findings from the previous chapters by resuming the subquestions to enable building our final answer to the main research question. In Section 9.2, we derive important lessons from the cases and discuss with regard to the two-tier framework. In Section 9.3, the remaining orgware challenges are listed in a concluding orgware agenda and a few policy reflections are made. Section 9.4 elaborates on the value and adequacy of the applied approach and theoretical framework to find the answers to our research question. We conclude this section by formulating interesting future avenues for research.



2

Addressing wicked, complex governance problems – towards a theoretical framework



Parts of this chapter have been previously published as:
Van Brussel, S., Boelens, L., & Lauwers, D. (2016). Unravelling the Flemish Mobility Orgware:
the transition towards a sustainable mobility from an actor network perspective.
European Planning Studies, 24(7), 1336-1356.

2.1

Wickedness and complex adaptive systems

In the introduction we have considered mobility issues as wicked problems, as the proposed solutions have generated new mobility problems time and again. Indeed, the mobility patterns that have resulted from our individual behaviours, choices, and collective customs in the dynamic, complex real world are not predictable, but ever changing. As such, the predict-and-provide approach, looking for hardware and software interventions, could not offer long-term mobility solutions neither with regard to congestion, nor with regard to negative environmental and health impacts. If we thus consider mobility issues as wicked, we need to engage in a more systemic conception of mobility. We need to unfold, or materialise the mobility orgware so to say. An appropriate approach should highlight the many interrelated components that result in our mobility patterns. It preferably accounts for both supply-side and demand-side actors and measures. The approach should address the actors, factors, and institutions related to the generation of travel, to its transport modes, to the displacement patterns in time and space, and to the impacts on the environment (in fact the basic principles of the sustainable mobility paradigm are still a valid starting point). All those components are connected and reciprocally influence each other, often in an unpredictable way. As such, a systemic mobility conceptualisation exhibits many parallels with a complex system. Besides, this interest in complexity theories increased not only in the transport and mobility planning disciplines, and the public administration research, but in many other disciplines as well (Teisman 2008, Schwanen 2017).

Complexity theories typically study systems or networks that are characterised by a-linear feedback loops and self-organising processes. The theories are especially interested in the adaptiveness of such complex systems, in its learning capacity (Stacey 1996). As such, we will arrive at the complex adaptive systems (CAS), at the end of this section. When we want to allow for complexity, our mobility planning strategies or mechanisms need a makeover, a shift in think patterns. The complexity literature and the related systems theories suggest to work on a few basic conceptions that go along with a complex understanding. In this chapter, we first have to sort out why mobility problems are wicked and why the mobility transition is complex. What does it mean to embrace complexity? Second, we have to answer the question: who or what enables a mobility transition? A third question deals with the meaning of governance regarding this complexity framework. As a last question the chapter should give us some clues about the remaining challenges for our orgware agenda.

2.1.1

About "complex" and "complexity"

In this dissertation complex systems can be outlined by a-linear development, by order and chaos, by static and closed systems or dynamic and open ones. Nevertheless, systems as a whole predominantly develop in a chaotic, a-linear way according to the following quote of Stacey (Teisman 2005: 42-43).

Contrary to some of our most deep-seated beliefs, mess is the material from which life and creativity are built, and it turns out that they are built, not according to some prior design, but through a process of spontaneous self-organization that produces emergent outcomes. (Stacey 1996: 9)

Adopting complexity means that certainty and predictability are replaced by emergence and a-linearity. There are so many interrelations that a simple causal relation cannot be distilled anymore. Instead, there are infinite future paths which we cannot oversee, and which will each direct us towards different future outcomes. Even a process that is run several times under the same conditions, will not produce the same results twice, except by mere coincident. Hence, situational approaches gain attention over generic ones (De Roo 2012, Jessop 1997) and the emphasis shifts from being and planning on the basis of the here and now, towards planning for an undefined becoming (Boelens and De Roo 2014). Instead of focusing on inputs and outputs, working with complexity demands an approach that focuses on throughput (De Roo 2012).

Different levels of complexity can be distinguished. Additional to simple systems or entities, there are complicated systems, that can only be fully understood by experts in that matter. In their turn, complicated systems contrast with complex systems, because the latter can never be truly understood or predicted. An example of a complicated system is a watch or any kind of machine, that consists of several parts, but those parts interact in a stable way. As such, they can be fixed by certain experts in that particular matter. Not everyone knows how to repair such systems or how to build them, but some of them do. A complex system, on the other hand, has also various subsystems on multiple levels, but these subsystems interact with each other in a dynamic way, driven by their own objectives and ideas (self-organising). That is why they cannot be fixed once and for all. Solving then becomes a matter of “playing with complexity” (Hertogh and Westerveld 2010), rather than neglecting complexity.

Hertogh and Westerveld (2010) combine the degree of complicatedness (or “detail complexity”) and complexity (or “dynamic complexity”) into a matrix, proposing four kinds of systems (in the quadrants): simple, complicated, complex, and both complicated and complex, see Figure 3. We included their matrix, as they refer to those quadrants and propose for each quadrant a preferred governance strategy. Those governance strategies will be elaborated in more detail further on in this dissertation.

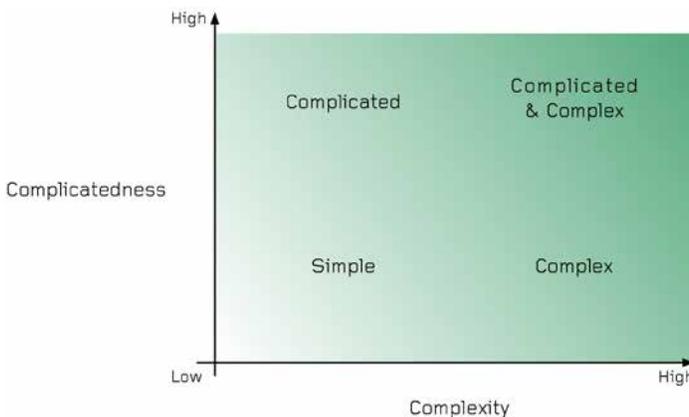


Figure 3
Complicatedness versus complexity. Source: based on Hertogh and Westerveld (2010: 222, figure 5.6).

2.1.2

Complexity in planning – the rise of complex adaptive systems

Traditionally, planners adopted a quite linear perspective on issues; a problem was experienced and a rapid solution was sought. In many occasions the perspective of that solution space was too reductionist and did not suffice to offer solutions that did not generate other problems. In response, it became increasingly acknowledged that complexity should be grasped, and that a more holistic attempt to solve the issues would start from the actors and the opportunities that emerge in specific situations (i.e. specific in time and place) (Teisman 2005, Chapter 2). This last complexity-embracing perspective in planning and (public) management stems from evolutionary insights and complexity as encountered in the field of biology (Hertogh and Westerveld 2010). Also the adoption of the concept “complex adaptive system” (CAS) in planning and governance research originated from the latter field and increasingly gained attention in recent decades. A CAS can be defined as a “complex macroscopic collection of relatively similar, connected micro-structures, formed to adapt to a changing environment” (Cohen, Riolo, and Axelrod 1999, Stacey 2001).

Planning turned to complexity theory and system theories to get insights in the dynamic processes of change in organisations, institutions, planning processes, etc. that have not yet been answered or utilised by former (more traditional) planning rationales.

Bovaird (2008: 320) summarises which characteristics of CAS attracted social scientists (like us) in particular:

- The existence of self-organizing activity, apparently without any form of central direction or control, resulting in system-wide behaviours which bring positive benefits to system members.
- The apparent generation of functional group behaviour from simple shared rules, rather than cognitive decision-making.
- The existence in complex adaptive systems of “strange attractors”, or underlying and unchanging regularities in system behaviour which mean that the nonrepeating (and often apparently chaotic) behaviour of the system conforms nevertheless to some level of predictability.
- The appearance in complex adaptive systems of “phase transitions”, in which rapid system transformations occur.
- The appearance in complex adaptive systems of “emergent properties” which are not predictable from the other characteristics of the system and which make its future behaviour more homogeneous.

To describe complex systems and how we should perceive their functioning, the concept of complex adaptive systems is introduced (Axelrod, Cohen, and Babylonia 2001, Stacey 2001). CAS should be regarded as complex systems that exist out of many subsystems on multiple (scale) levels and hyper-systems or environments,

that are continuously self-organising in the interaction with each other (De Roo 2012, Holland 1992). In complex adaptive systems the aggregated behaviour cannot just be summarized or derived from the actions of the constituting parts. Additionally, they have the specific ability to adapt their structure and working mechanisms to the environment they encounter. This adaptive nature characterises CAS as it reflects the openness of the system (and its mechanism, behaviour) and its self-organising adjusting capacity to survive. Non-adaptability, on the other hand, is typical for complicated systems, their structure remains the same irrespective of developments of changes in the environment (Portugali 2012). The concepts of reflexive governance and evolutionary governance theory, which are elaborated in section 2.3, also refer to the adaptive or reflexive capacity that characterises CAS (Rip 2006, Beunen, Van Assche, and Duineveld 2015, Van Assche, Beunen, and Duineveld 2013).

But the concept cannot be copied completely from the field of biology. Evolutionary theories in biology emphasise both a blind variation and selection, implying that the quality of outcomes cannot be guaranteed, except that they “fit the contingencies of the selection environment”. This cannot be said for the evolution of CAS in the field of science and technology or social life; for selection is not blind in that case. Arising and infantine variations (or thus innovations) are sometimes protected or subsidised to survive. So, there is even “anticipation on eventual selection up to attempts to change the selection environment so as to increase the chances for variation to survive” (Rip 2006: 84).

The ‘complexity’ of complex adaptive systems expresses a system in motion as a consequence of a situation that is out of equilibrium. Rather than descending into a ‘dead’ situation or into chaos, complex adaptive systems show emergent behaviour and co-evolve, while maintaining a proper level of ‘fitness’, that is, the ability of a system to survive between extremes – between order and chaos, coherence and diversity. (De Roo 2012: 141-142)

The various interrelated entities of CAS have the potential to co-evolve. Coevolution is to be understood as the resulting process of self-organising subentities on the aggregated level of the system. Through co-evolution the system adapts to a new context and hereby simultaneously influences this context. Thus, through this co-evolution the institutional context – that is supposed to bring stability – exerts influence and is influenced itself. Therefore, one could speak of a process that keeps the balance between stability and dynamics (De Roo 2012: 150), between control and interaction (Hertogh and Westerveld 2010), between variety and reduction (of options) (Salet, Bertolini, and Giezen 2013). Some would even call co-evolution a diagnosis, rather than a theory, considering it a plea for bridging the gap between theory and practice, between science and society (Nowotny, Scott, and Gibbons 2001).

Co-evolution is often used as a broad characterisation of co-development and mutual shaping, without specific reference to evolutionary theory. [...] Such terminology carries a message (and an important message): things hang together and linear cause-effect relationships are the exception rather than the rule. (Rip 2006: 95)

Cities can be regarded as CAS, since they are artefacts (originated and reproduced by art and human culture), and human beings are their living and self-organising underlying entities that can live, decide, plan, and change their mind. As such, their actions are the product of their intentions, their plans, their habits or routines, culture, etc. In addition, humans themselves, however, are also CAS, as they are composed of smaller parts (organs, tissues, etc.) that are interconnected as well; they too have the ability to self-organise to adjust to their changing environment (Portugali 2012).

De Roo (2012: 140) explicitly mentions the complexity of traffic and infrastructure as an example of an issue that is to be regarded as a complex adaptive system. However, it is not considered as such by politicians; e.g. politicians are inclined to solve congestion problems by adding new infrastructure, providing for missing links or increasing the present capacity by adding new lanes. This is a too simplistic solution, stemming from a linear way of thinking, De Roo (2012) argues. Indeed, at first, congestion will seem to have disappeared or diminished, but on the longer term, these new lanes will attract even more people, that previously did not prefer the car precisely because of the congested traffic (induced traffic effect). Consequently, in the long term, road traffic becomes congested again.

2.1.3

CAS steering mechanisms

Earlier, we have mentioned that complex systems and complex adaptive systems consist of multiple parts (subsystems) that continuously interact according to their own rules and objectives (self-organising). On an aggregated level the interactions and activities of self-organising actors and subsystems result in co-evolutionary patterns. But, this implies that system changes cannot be steered or managed directly (Luhmann 1997). The systems and changes emerge as result of deliberate actions of certain parts of the system (self-organisation) or, more often, as result of fortuitous events (or confluence of events) in the system or its environment. Self-organisation is seen as “a central source for system evolution, as important as guidance by politicians and governments” (Teisman 2008: 344). The remaining question is: if/how CAS can be steered to tackle the wicked problems they often generate?

To answer that question we refer to Luhmann’s ideas in his “Society of Societies” (1997). The core of Luhmann’s theory is the systemic approach of society. It allows individuals, politicians, planners, experts, etc. to arrange a level of stability within a chaotic surrounding world, by a systematic selection, interpretation, and structuration (Luhmann 1997). This system of structuration has become autopoietic⁷ because of the communication and elaboration of rules in each of the subsystems within society (Richard and David 2006, Van Assche and Verschraegen 2008). In fact, according to Luhmann, the subsystems can be compared with islands of reduced

7 cf. ‘autopoiesis’ in section 2.3.3.1; autopoietic refers to the ability of the system (or actor) to reproduce itself again and again, and meanwhile to react upon the challenges imposed by a changing environment.

complexity. Although all of these subsystems evolve relatively closed, and are driven by a self-steering focus, Luhmann sees them as open systems. Our society, for instance, encompasses several systems, e.g. the economic, the political, the cultural, the educational, the infrastructural, etc., which all reciprocally influence each other. Luhmann then conceptualises the constitution of social consistency in two ways. First, social (sub)systems are islands of reduced complexity that continuously reproduce and adapt themselves (i.e. self-organise) within a fuzzy world. Second, those subsystems are conditioned by and are co-evolutionary to other systems (or to their environment or setting). Although Luhmann and other system theorists remain sceptical about direct forms of steering, opportunities for indirect steering have been investigated (Anderson 1999, Van Assche and Verschraegen 2008).

So how do we have to perceive those subsystems, that self-organise and interact with other subsystems? Who has self-organising capacities? Therefore, we have to zoom in on the subsystems and look for the actors, factors, and institutions it comprises. Actors or subsystems⁸ can self-organise, as they can arrange themselves, their goals, and the way they operate without necessarily being subject to external pressures. What results from their interactions, convergence or divergence, often results from incremental changes. But those incremental steps can generate major changes in course (desired and undesired) when they are aggregated (Teisman 2008: 344). Furthermore, each subsystem comprises other subsystems, and hyper systems, and is the result of self-organising processes and of the interaction or co-evolution with other systems and with its environment. As the actors themselves are at the very basis of steering a CAS, we consider it important to dig deeper into those subsystems; to zoom in and trace the actors themselves. How do actors self-organise and arrange themselves? In this respect, the actor network theory and the actor relational approach offer some handhold to proceed our research.

2.2

The orgware: on the interplay between actor networks and structure

Scientists working with complex adaptive systems take a fundamentally different approach. They do not look for an overall blueprint for the whole system at all but, instead, they model individual agent interaction, with each agent behaving according to its own local principles of interaction. The interaction is local in the sense that each individual agent interacts with only a tiny proportion of the total population and it is local in the sense that none of them are following centrally determined rules of interaction. In such interaction, no individual agent, or group of agents, directly determines the rules of interaction of others or the patterns of behaviour that the system

8 Actors that are closely interacting and as such can be aggregated to what we call a subsystem, or what by some is called an action system

displays or how those patterns evolve and neither does anything outside of the system. This is the principle of self-organisation: agents interact locally according to their own principles, in the absence of an overall blueprint for the system they form. (Stacey 2007: 196)

The quote above captures why we, as planners that want to grasp complexity, try to unravel what we see; why we try to zoom in and out on the mobility system. Because we do not look for an overall blueprint or solution, but we consider the local interaction patterns between actors and institutions. Adopting the perspective of complex adaptive systems (i.e. zooming out), brings important processes as co-evolution, self-organisation, emergence, and adaptiveness central into planning theory (De Roo 2012: 144). Besides, notions of resilience, multilevel and situationalism, have already upgraded the planning vocabulary. However, when zooming in closer on the system again, by descending the system's subsystems to its smallest entities, a tangled assemblage of actor networks becomes visible. They form the structure that enables and constrains action (Giddens 1984), by continuous interaction patterns that can be reproduced and ceased again (Geels 2004: 907). Action does not take place in a void, but happens within the actor network's structure, including their institutions and practices. Therefore, questions of power and agency can be answered by looking into the actor network theory, and by elaborating on institutional theories.

2.2.1

Actors and actor networks

Actor network theory (ANT) learns us something about actors and how they become intentionally and unintentionally entangled in dynamic networks that together produce (and reproduce) the system. Callon & Law have conceptualised an actor network theory based on four principles. First, they see the social as fundamentally heterogeneous. Secondly, they state that all entities are networks of heterogeneous elements. Those networks act unpredictable and are fixed neither in form, space, nor time. Their identity changes while interacting in the network, it is only within and through (re)actions within this network that entities have meaning. Finally every stable social arrangement is simultaneously a point (individual) and a network (a collective), depending on the level of zooming in or out. By these four rules they overcome the individual/collective and the agent/structure dualism, by stating that this dualism does not exist, but is only a matter of perspective (Callon and Law 1997).

There is no difference between the person and the network of entities on which it acts. Or (the real point) between the person and the network of entities which acts through the person. Network and person: they are co-extensive. (Callon and Law 1997: 169)

ANT is based on actors and their relations (called networks). These relations are not only between the actors themselves but also between the actors and the non-human actors or factors, such as the more local conditions or the legal framework. ANT stresses that such networks are not necessarily stable or fixed

between the heterogeneous actors. Rather, ANT assumes that all actors are continuously reassembling and organizing their network in a certain way to become more innovative and vigorous (Boelens 2010: 36). In that respect, Callon elaborates four phases of translation. By “translation” he means the process “during which the identity of actors, the possibility of interaction and the margins of manoeuvre are negotiated and delimited” (Callon 1999: 59), see Figure 4.

The translation phases are not mutually exclusive, the phases have no clear beginning nor end. But each phase has its own focal characteristics or objectives. Callon distinguished the **problematization** as a first translation phase. During this phase, actors define themselves in relation to the problem that they encounter and try to react upon. In addition, the initiators then have “determined a set of actors and defined their identities in such a way as to establish themselves an obligatory passage point in the network of relationships they were building” (Callon 1986: 59). At the end of the problematization, the initiators have become indispensable in the network. Defining an *obligatory passage point* (OPP) is of paramount importance. The initiators want to show that joining the project is in the interest of all addressed actors. As such, during this actor networking phase, “a system of alliances or associations” is described and what their objectives are (Callon 1986: 61). Secondly, the **interessement** phase then “locks the allies into place” (cf. Latin: *inter-esse, literally being in between, being part of*). With interessement, Callon refers to “the group of actions by which an entity attempts to impose and stabilize the other actors it defines through its problematization”. He argues that “the interessement, if successful, confirms (more or less completely) the validity of the problematization and the alliance it implies” (Callon 1986: 62, 65). But that does not necessarily exclude the possibility that the problematization can be refuted afterwards.

The **enrolment** is the third phase in the translation of the actor network in which the roles are defined and coordinated. If the interessement is successful alliances are formed. In the enrolment phase, new roles are defined within the newborn associations; though it does not necessarily refer to pre-established roles. Each context of translation can offer other roles for the same actors.

The last phase is the **mobilisation of allies**. Callon speaks of *mobilising* because that means “to render entities mobile which were not so beforehand” (Callon 1986: 71). After the mobilisation of allies, the actor network has been built but can be subject to new translation rounds. Likewise, four translation phases are described by (Latour 2004) as wonderment, consultation, hierarchy and institutionalisation (also displayed in Figure 4).

From the present planning practice, Boelens addresses three imperfections of ANT, regarding the field of spatial planning. First, ANT stands out for its analytical power in retrospect, as it mainly concentrates on how things have become the way they are. But the ANT framework does not provide further details on the next steps for improving or sustaining certain initiatives. Boelens (2010) therefore argues that ANT stops where spatial planning starts.

Second, Boelens questions the equal weight of all actors in the network. He specifically points to the weighting of non-human entities compared to conscious,



Figure 4 Comparison of ANT translation phases and ARA planning steps. Source: own elaboration, based on Boelens (2010).

human actors capable of anticipating and negotiating (Boelens 2010: 38). Whereas in ANT non-humans are represented by intermediaries or mediators, those are in ARA not considered the leading actors, and thus only taken into account as part of the factors of importance. The differentiation or dichotomy between humans and non-humans in the field of mobility is not useful, because in reality as much as there are actors or assemblages of the human kind there are actors or assemblages of the non-human kind (e.g. infrastructures, ongoing projects or funds, technology, etc.). Furthermore, the division between the individual and the collective has to be overcome (Callon and Law 1997: 165). Hence it is important to differentiate between actors and actants⁹, with actants being the more dominant actors defining and/or organizing the network, and with actors as all other associations and acting bodies (Latour, 1997: as in Boelens 2010: 37).

The approach is not about actors as such, in the broad sense of interactive planning (i.e. all affected parties), but about leading actors, who are primarily encountered in the world of human action. (Boelens 2010: 41)

Third, the last translation phase of ANT does not shed light on how a support base is created for the actor network association, nor how it should be communicated, etc. (Callon 1999). As planners do not only intend to plan for the here and now, but mainly for the future and future development, one has to account for the actors (entities, people, resources) of future generations, that are not yet but will become part of the network, especially in the context of taking sustainable measures (Boelens 2010: 39).

⁹ 'actant': 'a person, creature, or object playing any of a set of active roles in a narrative' (cf. Oxford Dictionary).

To respond to those imperfections with respect to planning, and to narrow the gap between theory and practice, Boelens (2010) works out a planning approach that starts from ANT. He suggests to go beyond ANT onto a more “outside-inward” instead of inside-outward approach. He composes an actor relational approach (ARA) by extending the ANT approach with ideas from urban regime theories (URT) (of, i.a., Stoker and Mossberger 1994, Stone 1993) and from associative democracy (AD), (developed by, i.a., Hirst 1994, Hirst and Bader 2001, Cohen and Rogers 1992). Unlike the translation phases of the ANT, reconstructing the actor network associations from the perspective of the actors, the ARA approach specifically concentrates on the roles of the planner in this actor networking processes.

Postmodern, post-structural, and communicative alternatives have been developed to counter the highly top-down planning, but could not always deliver effective and sustainable practices. Boelens seeks explanation for this in that the alternatives are adaptations from within the same (governmental) planning framework, with the same vested actors eventually taking the lead. He then argues to turn the framework around: alternatives coming from the outside-inward should counter the established planning practices. This approach goes beyond the plan, “it does not focus on a particular plan or a particular formal institution as the given central objective”. It leaves a prominent role for a neutral moderator or mediator, and an open medium to sketch and explore the opportunities in an uncertain and complex world (Boelens 2010: 41). The seven planning steps proposed by ARA have an overlap with the four translation phases of ANT, as illustrated in Figure 4. Though they extend beyond the mobilisation of allies or institutionalisation to give some ideas on how to direct or sustain the emergent actor network associations.

The actor-relational approach does not focus on a particular plan or a particular formal institution as the given central objective. A behavioural actor-relational view demands a prominent role for a more neutral moderator and an open medium in which to sketch opportunities. (Boelens 2010: 41)

As the approach is based on URT and AD, ARA emphasises the need for a mix of actors from business society, public society, and civil society. Later the knowledge institutions were added to those. The first two ARA phases concentrate on identifying the relevant key actors: (1) “interpreting the problem by determining the focal actors and unique core values” and (2) “actor identification and actor analysis” (Boelens 2010: 43). The third step is to identify the windows of opportunity, or the developmental possibilities. All available planning instruments, technologies or methods can be used for this. The planner’s creativeness becomes important to figure out those possibilities. In the fourth phase, those identified windows of opportunity are discussed with the actors in bilateral or roundtable discussions. Phase three and four overlap with the interestment or consultation round of ANT. The fifth step includes testing the negotiated opportunities that were identified in the previous phase. The actors’ investments are specified. Phase six deals with the project-transcending added value of the tested business cases or pilot projects. This added value is then referred to as a developing regime (cf. URT). That regime can reconfirm or redevelop the unique selling points that have been defined before (in the first step). ARA phases four, five, and six can be linked to the enrolment phase. The seventh step considers how the developed regime can be “anchored in

associative democracies” (Boelens 2010: 45). Affected or triggered actors (citizens, businesses, etc.) can affiliate to those organisations, they can associate themselves with the developed regime to experience the benefits. This associative democracy can never replace the centralised top-down governmental apparatus, but it can be considered an important complement to that. It starts from the outside-in, namely from the civil, business, or academic society. Phases six and seven can be attributed to the mobilisation of allies or institutionalisation phase in ANT. But, as mentioned earlier, phase seven concretises the mobilisation of allies. It delivers concrete insights in how to sustain or direct emerging self-organising regimes (Boelens 2010: 43-46).

The ANT – ARA framework argues that every (social) action is fundamentally relational, it can only occur as a consequence of the specific connection between the heterogeneous material that shapes the network. It is only within this network that people, entities, institutions, and resources have meaning (Boelens 2010: 36, Law 1986). Only within specific interaction contexts institutions do exist. Indeed, because the actors are not only engaging in (inter)action within a given institutional framework, but also recursively making and reconstituting the institutional matrix (Jessop 2001: 8). Furthermore, Latour has even named the last translation phase the *institutionalisation* phase. As such, an introduction to the institutional theories is in place here.

2.2.2

Structure – Institutional theories

The previous section dealt with the building blocks of CAS: the actor networks. These actor networks do not act in a void, as illustrated by the different ANT or ARA steps, in Section 2.2.1. These actor networks shape and are shaped themselves by institutions. This also applies vice versa: “institutions never exist outside of specific action contexts” (Jessop 1997: 8). History matters, but change is possible; self-organising actor networks can make a difference, they can choose to change their direction. Hence there is a need to refocus on agency and power, on institutions in general, since they play a major role in the development of actor networks themselves. By answering the question on how and by whom institutions are shaped and changed, we get an idea of how the necessary orgware adjustments and behavioural change can be reached (Chapman 2007, Marsden, Mullen et al. 2014, Anable, Brand et al. 2012, Rajan 2006). By some, the refocus on behavioural change and agency is even called a recent mantra in transport planning, that surmounts the rationale of the individual (since there is no absolute rationality, the *homo economicus* does not exist) and therefore elaborates on the collective customs or structure behind them (Schwanen, Banister, and Anable 2012).

To get an insight in the Flemish mobility system and how the necessary orgware arrangements must look like, we have to decide which players and variables in the field of mobility and related policy fields we take into account, without neglecting the setting. The setting also “context” or “structure” – both determines possible outcomes and is itself determined and changed by the actors within the structure. Consequently, we cannot only focus on actors while neglecting the broader context

of institutions. For Law denotes that actors and actants, thus people, entities, resources that are connected, only have meaning within and through their network (Law 1986).

So before we go on examining and listing all important actors and factors within the mobility field, we need to indulge in this chapter in the institutional theories to get an image of the influences institutions can exert, and how they can possibly shape the mobility transition. From an institutional perspective, making the mobility system more sustainable can be seen as an institutional turn, or less radical, as an institutional change. Therefore we also need to focus on the conditions for an institutional change in order to identify possibilities in making this institutional change possible.

2.2.2.1 Institutions and perspectives on institutional change

Although much has been written about institutions and institutionalisation theory, it is not the purpose of this section to give an exhaustive overview of the different schools of/ perspectives on institutional theories. We elaborate on institutions for insights in how actors can influence institutional change.

Definitions of institutions often share the same basis: namely that institutions are formal and informal uncertainty reducing features, that create a certain order to (inter)act by establishing a stable (but not necessarily efficient) structure (i.a. North 1990, DiMaggio 1988, Giddens 1984).

Following Weimer (1995) institutions result from gradual evolution that is punctuated by acts of purposeful design. Buitelaar et al. (2007) add that institutionalisation is “accompanied by the development of particular discourses, and power and resource relations” (Buitelaar, Jacobs, and Lagendijk 2007: 894). Furthermore, specifically in the context of policy-making, Linder and Peters (1995) argue that institutional design often resembles a “tireless tinkering”, based on a decisional strand (producing solutions to problems), and based on a dialogical approach that concentrates on the social embeddedness of the process of institutionalisation. “Design will require conscious efforts at changing the cultural as well as ideational elements of the institution as well as its structural elements” (Linder and Peters 1995: 133). Consequently institutions can be considered as “social practices that are regularly and continuously repeated, that are sanctioned and maintained by social norms, and that have a major significance in the social structure” (Abercrombie et al., 1994, p. 216; Eisenstadt, 1968, p. 409; Wallis, 1985, pp. 399-401: all as in Jessop 2001).

By combining the various aforementioned flavours of institutional theory, Young (2017) defines institutions as “collections of rights, rules, principles, and decision-making procedures that give rise to social practices, assign roles to the participants in these practices, and guide interactions among the participants” (Young 2017: 27). Thus, institutions can be seen as the immaterial “atmosphere” that surrounds and influences the actors and factors. Imagining institutions as atmospheric allows to reveal the dual relationship. Actors can breath and live because there is an atmosphere providing air, but by breathing in and out they simultaneously alter the atmosphere.

On the other hand, institutions are often popularly seen “as organizations or social bodies that have major significance for the wider society and act in a quasi-corporate manner” (e.g. the branches of government, thus “institutions” as parts of government bodies) (Jessop 2001: 6). The latter definition can be crossed out in the context of this dissertation.

In their review on institutional theories dealing with institutionalisation (or institutional change), Buitelaar, Lagendijk, and Jacobs (2007) assess several perspectives dealing with institutional change, often resulting in the institutional design versus the evolutionary institutionalism dichotomy (Buitelaar, Lagendijk, and Jacobs 2007). The institutional design perspective holds an instrumental view on institutional change. It considers “the devising and realization of rules, procedures, and organizational structures that will enable and constrain behaviour and action so as to accord held values, achieve desired objectives, or execute given tasks” (Alexander 2002: 1). The evolutionary perspective assumes that institutions evolve gradually and build an “organic variation”, from which the most efficient institutions remain selected. It starts from a market setting, that leaves selection and variation completely to the actors pursuing their self-interest (i.a. Hayek 1960, Webster and Lai 2003). In subsequent research, this perspective was centred around the minimisation of transaction costs and the rational thinking of actors. Differences in efficiency levels were attributed to the bounded rationality of actors (Simon 1972). But critics disagreed that every institutional change brought about more efficiency (cf. Hodgson 1993). The evolutionary perspective focused on the increasing institutional efficiency, but did not consider that the institutional change itself was also linked to a transaction cost (Furubotn and Richter 1991). As such, the choices and investments made in the past, have an influence on feasibility of institutional change in the future. That formed the start of the path dependency perspective on institutions and institutional change, in which “history matters” (North 1990). The path dependency perspective does not attribute institutional change to creation or evolution, but institutional change is considered possible by both. The sociological institutional theories shed light on the symbolic and subjective values of institutions, which are sometimes the subsequent reason why institutional change does not necessarily result in an increasing efficiency. The perspective starts from the idea that not technical rationality but social or value-based rationality guides institutional change, and internal factors or pressures are assumed to instigate (incremental) institutional change (Olsen and March 1989, Linder and Peters 1995). The process of institutionalisation, or thus institutional change, is then defined as “a process in which fluid behaviour gradually solidifies into structures, which subsequently structure the behaviour of actors” (Arts and Leroy 2003: 31).

In our opinion, considering the complexity background of actors associating in dynamic actor networks and translating to strive their goals, the path dependency theory of North and the sociological institutionalism (Olsen and March 1989, Linder and Peters 1995) appear most relevant. That is why they are elaborated in more detail in the next section, in which we try to come up with a conceptualisation of institutional change that aligns with our actor network perspective.

2.2.2.2 Changing institutions: beyond history matters and lock-in

The path dependency perspective highlights that history matters and that an institutional path can be traced that is (partially) determined by events, made choices, etc. in the past (North 1990: 6). But sometimes, path dependency leads to lock-in situations, situations in which actors and institutions are stuck by successive choices, and find difficulty to break free from such situation. “In the path dependent model, actors are hemmed in by existing institutions and structures that channel them along established policy paths. Therefore, in any system, big (non-incremental) change is unlikely”, but not impossible (Wilsford 1994: 251). Machiavelli perceived it as follows.

There is nothing more difficult to manage, more dubious to accomplish, nor more doubtful of success... than to initiate a new order of things. The reformer has enemies in all those who profit from the old order and only lukewarm defenders in all those who would profit from the new order. (Machiavelli, as in: Wilsford 1994: 251)

A path dependent sequence of (political/economical) changes is a sequence that is tied to previous decisions, and limited by existing formal and informal institutions. In path dependent models, a choice made in the past, albeit random or not, and by individuals or not, has consequences and can limit options and choices in the future. Hence, we speak of a path and of path dependency. Very early in the evolution of things, various paths can be equally suitable. But, once a path is chosen it becomes increasingly likely to continue along the trodden path. Because over time little adaptations along this path will have the lowest transaction costs leading onto incremental changes all within the margins of the chosen path. Sometimes those trodden paths (the result of an aggregate of choices in the past) lead onto a lock-in situation where possibilities are limited just because of incremental and sometimes small decisions from the past (Wilsford 1994, Greener 2002).

Yet, path dependency differs from historical determinism, as (self-organising) actors can choose to reshape the path incrementally, or to create another path. History matters, but it does not determine the complete future. Path dependency theories allow for deviations from the trodden path. They tolerate breaking free from lock-in situations under some circumstances (Greener 2002, Wilsford 1994). Often the term window of opportunity is used. The way Wilsford assumes institutional change: “It is the combination of path dependent limits along with occasional windows of exceptional opportunity, or conjunctures, that determine the ways small or big that a political system responds to policy imperatives” (Wilsford 1994: 253). This vision aligns with the notions on institutional change of Buitelaar, Lagendijk, and Jacobs (2007), Burch, Hogwood et al. (2003), and Kingdon (1995), all pointing to “critical moments” or “windows of opportunity”.

In this respect, and based on the ideas of Kingdon (1995), Buitelaar, Jacobs, and Lagendijk (2007) suggest three streams of interest that must converge: the societal stream, the policy at hand, and the political endorsement and support base (see later). They also take a look at the alignment of the streams over time, and the availability of viable alternatives for making the institutional regimes actually change (Buitelaar, Jacobs, and Lagendijk 2007). The convergence can happen as a result of a critical moment, a window of opportunity.

Burch, Hogwood et al. (2003) theorized the critical moment for institutional change as “the moment when there is sufficient pressure, whether internally or externally driven”. In this moment, the prevailing institutional frames or hierarchies are questioned and alternative discourses are arising. The critical moment can then further evolve into a “critical juncture” if opportunities are grasped and a “new branching point is made in which the institutional development moves on to a new trajectory” (Burch, Hogwood et al. 2003: 8). If no viable alternatives are available at the critical moment (open window of opportunity), no institutional change will arise. These critical moments also play an important role in the comparable theory of streams by Kingdon (1995). Instead of the critical moment for institutional change he speaks of the critical condition for policy transformations. He identifies two major pre-decision processes (politics): the agenda setting (problems) and the alternative specification (policy) (Kingdon 1995).

The critical moment in Kingdon’s conceptualisation is formed by the matching of those three streams and is named the “window of opportunity”. For a window of opportunity to emerge and open, there has to be sufficient pressure, caused internally by alternative ideas (or solutions) and actions affecting the present situation, and/or externally by societal actors, trends, or events. At the same time acceptable other logics and discourses must be available. Three streams are introduced: the problems stream (setting the agenda), the policy stream (adapting the policy), and the politics’ stream (political endorsement and decision-making).

In [...] policy primeval soup, many ideas flow around, bumping into one another, encountering new ideas and forming combinations and recombinations. [...] While the origins are somewhat haphazard, the selection is not. (Kingdon 1995: 200)

If all the three streams are triggered, the probability of an item to rise on the decision agenda is dramatically increased. It is also important to keep in mind that the three streams act simultaneously, sometimes independently and sometimes coupled, through windows of opportunity and critical junctures. The quote below expresses how we must perceive it. The streams do not intend to reflect closed systems or streams. Rather, they can be aligned with the translation agenda of an actor network approach, if we consider the streams as dynamic actor network associations. Though, it might be necessary to bring interest and agency even more central into the institutional debate to identify the conditions for institutional change (DiMaggio 1988). The streams model of Kingdon has already been applied to explain the decision-making process and identify the encountered challenges in the case of a large infrastructure project¹⁰ by Vanvelthoven and Lauwers (2010), and Vanvelthoven, Lauwers, and Goethals (2009).

Events do not proceed neatly in stages, steps, or phases. Instead, independent streams that flow through the system all at once, each with a life of its own and equal with one another, become coupled when a window opens. Thus participants do not first identify problems and then

10 The Oosterweel Link project to be precisely, a case that will be studied in this dissertation as well.

seek solutions for them; indeed, advocacy of solutions often precedes the highlighting of problems to which they become attached. (Kingdon 1995: 205, 206)

2.3

Governing complex adaptive systems

As we have elaborated on both the actors and their surrounding structures (or institutions), in the previous sections, the orgware components that are the subject of governing have been discussed. The interplay itself, the governance, is left to complete our conceptual framework. It is the object of investigation in this section. First, we present some definitions of governance. Second, an overview is given of the changing role and position of the government regarding the governance in general, starting from an overview of governance paradigms from the public administration research field. Third, we investigate what governing complexity means and we discuss several governance strategies to deal with different kinds of situations.

2.3.1

Governance- some definitions

Governance is understood as the result of the interaction of many actors who have their own particular problems, define goals and follow strategies to achieve them. Governance therefore also involves conflicting interests and struggle for dominance. (Voss and Kemp 2006: 9)

Nowadays, governance is a widely used and vague concept, that is often picked up in business contexts, where it refers to corporate governance. It is “the framework of rules and practices by which a board of directors ensures accountability, fairness, and transparency in a company’s relationship with its all stakeholders (financiers, customers, management, employees, government, and the community)” (<http://www.businessdictionary.com>). However, in this contribution, we specifically intend the much broader oriented institutional governance concept, which has already been extensively discussed in the literature and covers many more aspects (Bevir 2013, Jessop 1997, Pel and Teisman 2009, Rhodes 1996, Stoker 1998, Teisman, van Buuren, and Gerrits 2009, Van Assche, Beunen, and Duineveld 2013, Buitelaar, Jacobs, and Legendijk 2007, Mayntz 1998, Pierre 2000). Often governance is defined in reference to the term “government”. The latter can be understood as the system by which a state or community is controlled (Oxford English Dictionary 2014). The government refers to the person or group of people exercising authority over a politically organised territory. In contrast, “governance” implies a new process of governing in times of change (Rhodes 1996: 652-653). Accordingly, governance is often associated with the more decentralised, horizontally organised, and interdependent counterpart of a rather top-down and vertically oriented government (Scharpf 1997, Boelens 2010). Government can then be considered as just one kind of governance. The shift from government to governance is rather subtle than radical (Van Assche and Djanibekov 2012). Young argues that the decoupling of governance and government allows us to explore other

mechanisms through which, for instance, the society or the civic takes up this role. Likewise, Stoker (1998) defines governance as creating the conditions for “ordered rule and collective action”, in situations where “boundaries between and within public and private sectors have become blurred”. Somewhat more generically, governance can be perceived as the coordination of various forms of (in-)formal types of public, private, and public-private arrangements. In this sense governance relates to sustaining coordination and coherence among a wide variety of actors pursuing different purposes.

The role of the state in society is challenged and questioned for several reasons. First, there is an increasing awareness that societal problems can be solved by political institutions, but also by other actors. Second, the state has increasing issues to maintain its steering capacity. Third, some capacities are taken over by other transnational political powers due to the ongoing globalisation (Pierre 2000). Jessop and Young also offered definitions of governance; respectively written more from the institutional theories perspective, and from a focus on the earth systems governance (see quotes below). Both definitions acknowledge the complexity of governance efforts by referring to a “complex art of steering” or to “a social function centred on steering collective behaviour” (Jessop 1997, Young 2017). Those definitions are especially of interest for elaborating our orgware agenda, as it focuses on the interplay between actors (and actor systems) and institutions.

[...] the complex art of steering multiple agencies, institutions and systems that are both operationally autonomous from one another and structurally coupled through various forms of reciprocal interdependence.
(Jessop 1997: 111)

Governance is a social function centred on steering collective behaviour toward desired outcomes and away from undesirable outcomes.
(Young 2017: 26)

When talking about governing or steering, the “regime” concept often emerges in the literature on institutional theories. There, regimes are considered “as institutions specialized to addressing functionally defined topics (e.g. health care, pollution, trade) or spatially defined areas (e.g. Antarctica, the North Pacific, Western Europe)” (Young 1982 as in: Young 2017: 27); knowing that “institutions are collections of rights, rules, principles, and decision-making procedures that give rise to social practices, assign roles to the participants in these practices, and guide interactions among the participants” (Young 2017: 27), as mentioned before.

In the case of mobility, the present mobility regimes are institutions dealing with the governance issues or challenges of the sustainable mobility transition. For instance, the mobility regimes give rise to, amongst others, the preferences of transport modes, the attitude towards mobility measures, and the present mobility behaviour of people.

The transition management literature, that will be elaborated in more detail later, adopts the regime concept that is both challenged by novel innovations (niches), and exposed to rather inert external pressures (landscape, e.g. climate change, global warming, etc.).

Earlier, the regime concept was used in the context of urban regime theory and the actor network process. It represented the outcome and crystallisation of a self-organising actor network association. This perspective can be merged with the definition of regimes of Young, but from a more active point of view; regimes are actor networking associations that enable an appropriate response to current issues, that are not (yet) adequately addressed by other actors.

2.3.2

Evolution of the governmental position from a public administration perspective

Regarding the role of the government, governance developments or evolutions studied in the field of planning and public management research can be considered relevant. We can roughly follow the position or stance of government bodies in terms of extremes: from strongly top-down steered towards rather bottom-up oriented, eventually ending up with a combination of both.

In the post-war period a strong idea of manipulability prevailed (before the 70's and 80's). The outcomes of the highly centralised government apparatus dissatisfied, because planning problems seemed to get increasingly complex and crossed multiple policy fields. Consequently, an anti-government attitude dominated the next decade and the market principle and self-organisation gained attention. The role of the government was reduced to that of a facilitator, intervening in the conditions. However, some issues are not (and will never be) entirely accounted for by the market; some negative externalities are not sufficiently compensated for without any governmental interventions or incentives. Hence, in the 1990's and 2000's, one agreed that a mix of both was desirable, a combination of both top-down and bottom-up initiatives (Geerlings 2012). These three periods, end 80's, 90's, 2000's coincide with respectively the Public Administration paradigm (PA, till the 70's and 80's), the New Public Management (NPM, 90's), and the New Public Governance (NPG, from the 2000s onwards) (Geerlings 2012, Osborne 2006)¹¹. However, current public policy-making can still be characterised by features of all three approaches (Bovaird and Löffler 2009: 25).

First, the Public Administration (PA) realm is characterised by “the dominance of the ‘rule of law’, a focus on administering set rules and guidelines; a central role for the bureaucracy in policy making and implementation; the politics-administration split within public organisations; a commitment to incremental budgeting; and the hegemony of the professional in the service delivery system” (Osborne 2006: 378). The PA was outlined by a top-down hierarchy (Osborne 2006). Though a certain notion of co-production was already developing, it was limited to considering citizens as “clients” of public services. The idea behind that was that public service provision requires co-production, because it focuses on serving the citizen (Osborne and Strokosch 2013).

¹¹ This sketch of the ‘evolution’ of public governance is indicative, since it is context and time dependent; additionally not all researchers see NPM as distinct from PA to be a new stage or paradigm, and some even see it as a failed paradigm (Osborne 2006).

The wave of reforms in the public sector since the 1980s is often referred to as the “New public management” (NPM). This paradigm aspired to counter the bureaucratic principles and to apply instruments and management styles from the private sector to the public sector. The basic values of the NPM could be expressed by economy, efficiency, and effectiveness. Important features of the instrumental NPM reform were “the transition from input to output control and the replacement of the traditional centralised organisational structure by decentralised organisational devices” (Jan Van helden and Pieter Jansen 2003). The coproduction concept was introduced in the NPM. It could be interpreted as the distribution of the production of public services amongst private actors. The focus was primarily on efficiency and result-oriented work, so salvation was sought in market forces and public private partnerships (PPPs) flourished (Bovaird and Löffler 2009: 103). Over the years, co-production became associated, with the concept of “consumerism” and with a contrasting view on effectiveness.

It has not been a steady state concept but has evolved, portraying service users as co-producers in different guises – as citizens/clients, consumers, customers – and latterly simply as ‘co-producers’. (Osborne and Strokosch 2013: 34, on the evolving meaning of co-production)

The subsequent New Public Governance Paradigm (NPG) combined the best of both PA and NPM (Osborne 2006). Growing evidence demonstrated that neither a mere top-down (central) steering or “government” capacity, nor a bottom-up decentralised market could handle the complex socio-technical systems that constitute reality (Geerlings 2012: 20-21). Accordingly, an answer was found by merging elements of both paradigms. In the NPM, interventions were judged based on their results (in terms of input-output). In contrast, the NPG focused on the process and the interactions between several stakeholders that resulted in certain outcomes (Bovaird and Löffler 2009: 9). Although co-production had been developed earlier, it eventually became a central and more comprehensive concept within the NPG.

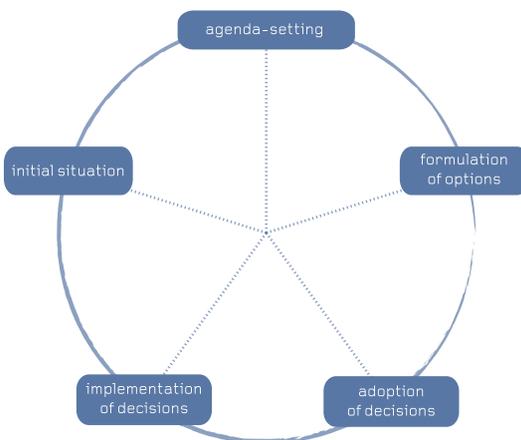


Figure 5 Policy implementation cycle. Source: based on Rittel and Webber (1973) and elaborated by Mees, Tempels et al. (2016).

As the often synonymous uses of “co-production” for different terms and contexts could create confusion, the multiple interpretations of co-production are put together. Based on the earlier work and conceptualisation of Brudney and England (1983), Alford (1998: 135) defines co-production as “the involvement of citizens, clients, consumers, volunteers and/or community organisations in producing public services and consuming or otherwise benefiting from them.” In public administration theory it related (or was often restricted) to the “delivery of public services” (Osborne and Strokosch 2013). Planning theory interpreted the concept as the involvement or participation of citizens in the strategic planning process (Albrechts 2012).

2.3.3

Towards governing (in) complexity

In the past, the cornerstone of public administration was the policy implementation. But from that strong belief in manipulability and a hierarchical top-down steering policy, the steering mechanism shifted towards the total opposite in the following decade. A disbelief in steering prevailed in the NPM. The free market and self-organisation principles took the upper hand. The government became more fragmented and took the role of the facilitator in the new public management. From then on, public and private actors would coproduce governance services. Nevertheless, that co-production appeared time consuming, and it was still working towards a relatively fixed goal (albeit on the short or long term). In this respect, De Roo (2012: 134) pointed towards the paradox of planning:

[...] most attention is focused on the precise moment at which a decision is to be made, with arguments referring to the here and now, while the ‘becoming’ (which is what we basically plan for, a fact that some of us tend to forget) is secondary, considered as not much more than the logical follow up of a linear extrapolation (technical rationale) and a commitment (communicative rationale) made operational to a decision. (De Roo 2012: 134)

Although notions of path dependency and related institutional insights gained interest, adopting a profound notion of time, acknowledging real complexity, did not yet receive the appreciation it deserves; a missed opportunity to narrow the gap between theory and practice and to align with debates on complex decision-making and organisational adaptiveness.

Later endorsed by De Roo (2012), Pollitt advocated for a shift in perspective: from the past/present to the future; in this respect, the title of a recent book reflected his disappointment in the level of ambition of present government strategies: “Time, policy, management; governing the past” (Pollitt 2008).

Scenario planning, can be considered a first step towards the incorporation of dynamics. That tradition already incorporates a slight notion of time, as for a certain given past various future options are considered (open future). However the extrapolation is based on linear thinking, and can therefore not entirely grasp the notion of time with its associated uncertainty. The moment that one decides upon both the scenario and the issues that are planned for (problem definition) is bound to the here and now, leaving an open future behind (De Roo 2012: 147).

Transition thinking is affiliated to scenario planning given its intrinsic notion of time. But unlike scenario planning, transition approaches adopt a non-linear progression over time; transitions can be perceived as a-linear movements from one stable situation or level to another (Geels 2002b, 2004, 2012, Geels and Schot 2007, Rotmans and Loorbach 2010, Switzer, Bertolini, and Grin 2013). Transitions will only take place when the time is “right”. This inclines De Roo (2012) even more to perceive transitions as an important step towards incorporating time within planning theory. Speaking of transitions also refers to a reality that recognises different levels of stability. It reflects a spectrum that ranges from out of equilibrium to near equilibrium (De Roo 2012, Portugali 2006). The idea and relevance of path dependency returns here, but in multilevel and a-linear way. At the same time it acknowledges the intertwining with the contextual environment (reciprocal influence). Transitions thus take account of the interrelated, fuzzy, and unpredictable course of tangled paths.

Transition is a relatively new concept derived from the complexity sciences that could become instrumental to planning theory and practice. [...] it touches upon reality more realistically than scenarios and their linear assumptions. Transitions present a reality full of leaps and sudden change, causation being strongly relational. [...] The cause of the transition emerges out of the often fuzzy relationship between a system, its subsystems and the contextual environment to which the system is connected. The connectivity between the system and context diminishes, affecting the system’s relationship to its subsystems through self-organizing mechanisms, pushing the system into a process of co-evolution towards a better fit with a new contextual environment. (De Roo 2012: 151)

If we truly want to allow for time and dynamics, we cannot solely focus on delivered objectives or output at a given time. Because these are bound by the here and now. Many governance processes are still co-production oriented, and directed towards realising a relatively fixed goal (albeit on the short or long term). That fixed goal is something difficult to accept when acknowledging the complex nature of the real world. Especially regarding our previous reflections in Section 2.2, only considering co-production does not comply with our view on the potential of the self-organising actor networks, that are at the very basis for change (by their continuous interactions). Those processes lay at the basis of how actor networks come into existing and how actors influence and are influenced by their environment and institutional setting (cf. Section 2.2). Figure 6 illustrates the relation between a co-production and a co-evolutionary perspective.

As we are still far from the desired mobility transition, some scholars call for a more radical and systemic change, or transition (i.a. Nykvist and Whitmarsh 2008: 1373). That is why the new realism approaches place hope in the transition management perspective (Nykvist and Whitmarsh 2008, Schwanen, Banister, and Anable 2012). They aspire to grasp the complexity that is encountered in real-world planning, by considering mobility in a systemic whole (Urry 2004).

Those approaches start from the conviction that the issues calling for a transition are complex¹²; they generate wicked problems; their solutions should span different interrelated policy fields, and no simple answer or solution exists. Therefore, the transition management approach places mobility in a wider socio-technical perspective. Institutions matter in that perspective, and present and future challenges from the in- and outside are taken into consideration. Behavioural change is also high on the agenda. Therefore, alternatives, context, and timing play an important role as well (Geerlings 2012, Geerlings, Shiftan, and Stead 2012).

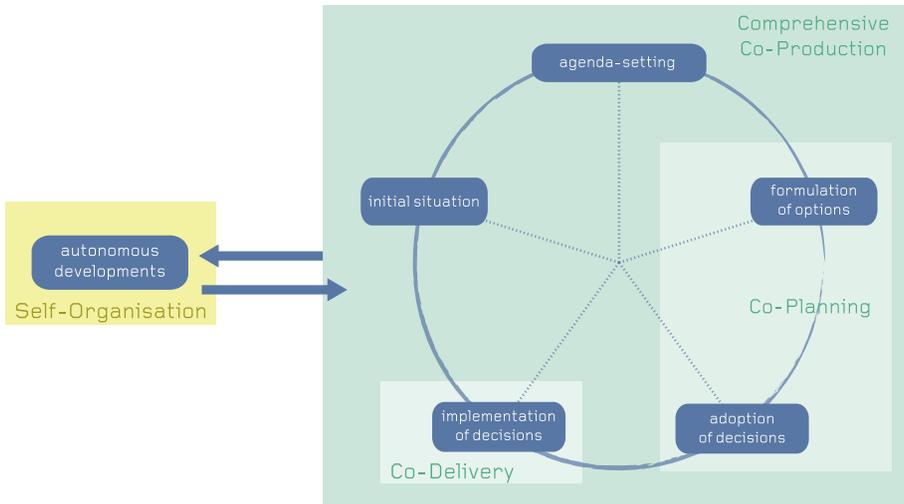


Figure 6 Notions of co-production in relation to each other and to the policy implementation cycle. Source: based on Mees, Tempels et al. (2016: 25, figure 1).

[...] the notion of governance emphasizes the need to enrol multiple actors in processes of intervention and to work with more complex understandings of the intrinsic non-linearity of dynamic socio-technical systems. (Shove and Walker 2010: 475)

Despite huge theoretical efforts in this field, actual implementation of the knowledge in practice lags behind (Hull 2008, Marsden, Mullen et al. 2014, Paredis and Block 2015). Hence, we try to acquire an insight in the governance concepts that have already gained attention with respect to transitions.

The reflexive governance concept, for instance, focuses on how governance arrangements build the ability to evolve and adapt over time. But perhaps the most well-known framework, introduced in this respect, is the transition management approach. That framework relates to the concept of reflexive governance and advocates the multilevel perspective (Geerlings, Shiftan, and Stead 2012). Furthermore, reflexivity is also embraced by the evolutionary governance theory (EGT). EGT links notions of “change” in social systems theory and institutional theories to governance paths. It thus also refers to path dependency and other interdependencies that influence governance mechanisms.

12 Transition management approaches often specifically address sustainability issues

2.3.3.1 Changing governance mechanisms: reflexive governance, evolutionary governance theory and transition management

Few attention has been paid to how governance arrangements themselves change over time, how the strategies can be adapted to a changing environment, or how they manage the challenges from the in and outside. In this respect, two related concepts are discussed that analyse and conceptualise the change or (co-)evolution of governance mechanisms. First, “reflexive governance” clarifies how change in governance arrangements should be perceived. Second, the evolutionary governance theory (EGT) refines the reflexive governance concept by zooming in on the various actors and their developmental paths, whereby issues of power and agency are never far away.

“Reflexive” regarding reflexive governance can be interpreted in two ways. First, it refers to the cycle of problem producing – problem solving, after which new problems emerge, which then are to be “solved” again, etc. Reflexivity is thus understood as the result of self-confrontation and self-reference. Voss and Kemp (2006) call this the first-order reflexivity. Earlier in this dissertation, Luhmann has named this the “autopoiesis”. It is the ability of the system (or actor) to reproduce itself again and again, and meanwhile to react upon the challenges imposed by a changing environment (self-organisation). If a problem originates from a certain environment, the system or actor can respond to the problem by proposing a solution and by rearranging itself to surmount the problem. Self-organisation can be defined as a process that spontaneously occurs when the system is triggered (e.g. by a substantial change in its environment) to re-organize itself in a different way than before; when they “produce a different pattern without any blueprint for that pattern” (Stacey 2007: 193). The second-order reflexivity occurs at the aggregate level of the system or the arrangement; it shows the ability to interfere within the (meta)system and recognises the active interplay between agency (actors) and structure (institutions), that is called “structuration” (Giddens 1984). The framework or cycle that introduces “problem producing – problem solving” routines is rethought and the execution is adapted. This second order reflexivity also relates to co-evolution. Both meanings are inherent to reflexive governance and enable the approach to grasp the complex reality.

The reflexive governance approach focuses on dealing with sustainability issues; whereby the latter are regarded as profoundly complex problems. Those problems entail many interrelated (sub)problems at multiple scale levels. Consequently, addressing those problems in a systemic way is desirable. Voss and Kemp (2006) argue that sustainability does not reflect a desired end state from which operable criteria can be distilled to act upon. They rather consider sustainability as a way of problem framing that exposes the many interconnections of the various underlying problems and scales, the impacts, albeit desired or not (side-effects), and this on the short and the long term. According to Voss and Kemp (2006) transition management is just one – but a rather comprehensive one – out of the many approaches that can be situated within reflexive governance.

Reflexive governance thus implies that one calls into question the foundations of governance itself, that is, the concepts, practices and institutions by which societal development is governed, and that one envisions alternatives and reinvents and shapes those foundations. (Voss and Kemp 2006: 4)

Reflexive governance contrasts with the rational problem solving that is associated with modernity and is (and was) central to past and present governance strategies (Voss and Kemp 2006: 4). This rational problem solving governance strategy has reduced complexity by decomposing the messy problems into smaller, oversimplified but more manageable parts of the problem. Voss and Kemp (2006: 5) call this “a pattern of productive reduction of complexity” that “orchestrates modern science, technology development, bureaucratic organisation, project management, [...]” They state that the more evasive the character of problem solving is, “the more effective it becomes regarding implementation and valorisation (instrumental purposes), but “the stronger the impacts of unintended consequences become” (Voss and Kemp 2006: 5).

Since the knowledge is distributed over various (self-organising) actors, it is logical that a variety of actors and roles are involved in the governance process. However, all roles are filled in contingently: some rather give, some only take; nothing can be guaranteed. So, “instead of steering, there is reflective (and reflexive) intervention” (Rip 2002 as in, 2006: 88).

The orientation then is less towards solving problems (of sustainability), but towards creating and maintaining spaces for working towards solutions. This might include increasing reflexivity as an institutional capacity. In a co-evolutionary perspective, reflexivity and attendant learning is located in the processes and at the system level, not in the heads of individuals. (Rip 2006: 89)

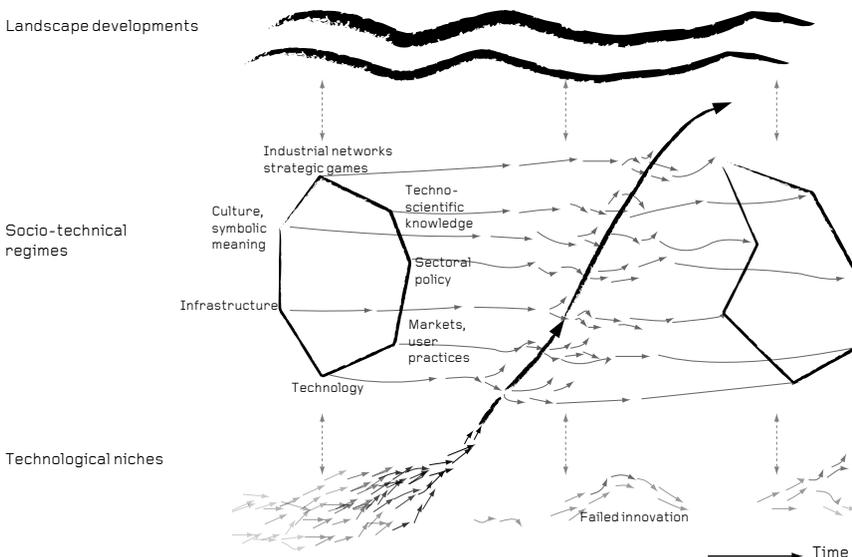


Figure 7 A dynamic multi-level perspective on technological transitions. Source: Geels (2002a: 1263, figure 5).

In the research field of transition management, the multi-level perspective (MLP) is widely accepted (Figure 8). This approach starts from the assumption that transitions are a-linear processes resulting from concurring developments at three levels (ranked from the least stable to the most stable). The first level is the niche, the locus for radical action or change. The second level is that of the socio-technical regimes. At this level the established actors, practices, and rules are situated. The third level comprises the exogenous socio-technical landscape that is characterised by slow and subtle change (Geels 2002b, 2012).

These different levels, as (Geels 2002a) calls them, have their own rhythm or inertia and will react upon changes during another moment or even period. Though the MLP can represent the general transition course of innovations, we want to voice a few remarks. The first one is about the “level” in multilevel perspective. According to our ideas, those should not be named “levels”, since this suggests a kind of threshold within the evolution or transition process to attain the next level. The distinction between niche-regime-landscape is rather subjective and more nuanced. However the three-division is useful indicatively. Second, we want to underline that this gradual evolution can be subject of discussion. Not every innovation is equally successful after all. Some innovations never leave the niche sphere, or some will never become institutionalised in the regime. Thus, not every innovation will have trodden the same path or will have followed the same stages in the proposed order. That is why we need not forget the smaller arrows at the bottom of Figure 7. According to those critiques, we conceive these levels of actors and institutions of the socio-technical system as contingent and co-evolving over the various levels. We would preferably speak of “arenas”, and of a multi-arena perspective instead of a multilevel perspective.

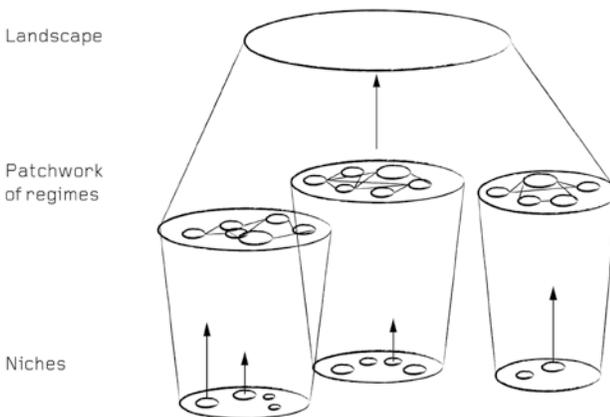


Figure 8 Multiple levels as a nested hierarchy. Source: Geels (2002b: 1261)

However, from this MLP framework the distinction between the levels proves useful. Representing these levels is interesting to estimate both the capacity and the accessibility of resources to change. So we will maintain some of the key-features of the transition management approach in our further conceptualisation of the mobility system.

Evolutionary Governance Theory (EGT) as conceptualised by i.a. Lowndes and Skelcher (1998), Van Assche, Beunen, and Duineveld (2013), Van Assche and Djanibekov (2012) has much in common with the reflexive governance concept. It frames evolutions and changes in governance arrangements by focusing on multiple governance paths. It looks at how the various dependencies have made those paths to what they have (or will) become.

In EGT, there are three types of dependencies that exert force over the developing path: path dependency, interdependency, and goal dependency. First, path dependency is an obvious dependency that gains a lot of attention in explaining certain developments over time (history matters). Path dependency concentrates on the transaction costs and the cultural aspects that form the bases of past choices and will determine to some extent future options. It focuses on the capacity to adapt to the changing environment, and thus on the autopoiesis, on the production and reproduction of the self to keep up with changes in the environment. Second, interdependency reorients the focus from the self to the other players and the accompanying rules of the game. Anticipating the other's ideas and future "moves" or "game making", becomes important since you are never playing alone. The interactions between various other actors and between their arrangements also influences the paths that can be followed. Although this dependency is substantial, it is often neglected when studying evolution or development of systems. Third, goal dependency refers to the interfering paths of actors when sharing a goal or vision; this can also enable or restrict certain future options. Many links between EGT and institutional change theories can be drawn; e.g. the use of 'streams' or 'paths', the interdependencies and opportunities offered at moments of interference (cf. windows of opportunity, critical moments, cf. Section 2.2.2.2).

As EGT focuses on both the actors and rules of the game, and how they mutually arrange and are arranged (multiple interdependencies), and as EGT even mentions co-evolution, one could ask why the framework was not called the "co-evolutionary governance theory"; that might suit the framework better in our opinion.

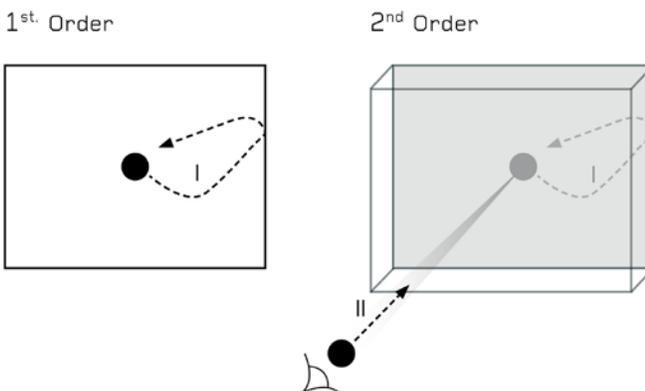


Figure 9 The dual meaning of reflexive with regard to reflexive governance.

Characterised by the same elementary characteristics (self-organisation, co-evolution, situationalism), reflexive governance and evolutionary governance theory, thus, converge with our reading on the indirect steering and change of complex (adaptive) systems. Reflexive governance can be seen as an umbrella concept for both adaptive (1st order reflexivity) and co-evolutionary (2nd order reflexivity) development. Rip (2006: 89) argues that this reflexive capacity is not yet sufficiently present in governance arrangements at hand; the focus is still too much on ad hoc problem solving and not enough redirected towards the processes of change, thus, towards “becoming”.

2.3.3.2 A spectrum of governance approaches

In summary, while previous approaches did not engage with a more complexity-embracing, situational perspective on governance, it is increasingly recognised that mobility has the characteristics of a complex system. It is complex because it “depends on multiple actors and factors, including the patterns of human settlements and consumption, the organisation of production, and the availability of infrastructure” (Geerlings, Shiftan, and Stead 2012: 5). In those complex systems, decision-making often also becomes complex. As “complexity strikes back if it is neglected” (Salet, Bertolini, and Giezen 2013: 1989). Likewise, “managing these processes involves much more than getting the problem right, choosing the best alternative and forcing through a plan. It is about acting in complexity” (Teisman 2008: 342). Adopting a co-evolutionary perspective allows us not only to grasp the adaptive capacity building of such complex systems over time, but it also accounts for the influence on their environment (conditions, institutions, circumstances, etc.). In this respect, some public administration researchers have elaborated on governing complex systems (Teisman, van Buuren, and Gerrits 2009). They have envisioned a new agenda for governments and the role they should play regarding “creating the right conditions for effective policy making, including the domain of transport” (Geerlings, Shiftan, and Stead 2012: 5).

By combining the governance interpretations of the recent past (in Section 2.3.2), with the more recent encounter with complexity and co-evolutionary approaches (in Section 2.3.3), a spectrum of governance approaches can be composed according to the level in which the complexity regarding actors and setting is acknowledged (Hertogh and Westerveld 2010). Recall the matrix in Figure 3, setting out the different problems according to their score on complicatedness and on complexity. The scheme offers four quadrants of problems: from simple, complicated, or complex, to both complicated and complex. For each of those situations, Hertogh and Westerveld (2010) have formulated a management approach to deal with complexity in LIPs, see Figure 10.

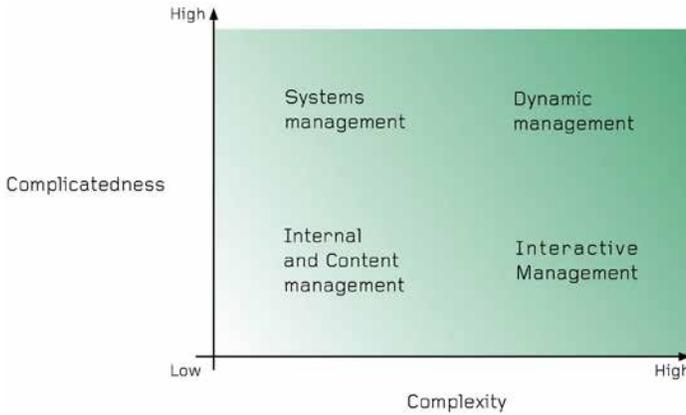


Figure 10 Four approaches on the management of complexity. Source: based on Hertogh and Westerveld (2010: 228, figure 5.9).

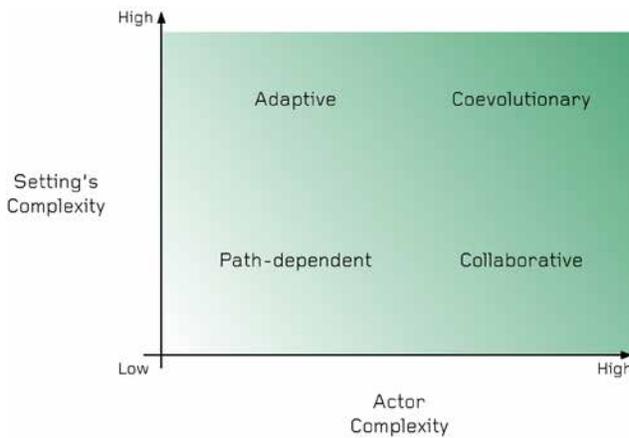


Figure 11 Four approaches on the governance of complexity with respect to actors and setting. Source: own elaboration based on Hertogh and Westerveld (2010: 228, figure 5.9) as in Boelens (2015).

Those strategies ranged from a low to a high level of complicatedness and from a low to a high level of complexity. The four strategies that their LIP research showed were: internal and content management, interactive management, systems management, and dynamic management. The matrix of strategies has been elaborated by Verbeek (2017: 110), Verbeek and Boelens (2016: 1925, figure 4), (Boelens 2015) to suit the field of environmental health in spatial planning, or respectively to propose an agenda for mobility, and was adopted by Tempels (2016: 158) in flood risk management. Although founded on a different body of planning literature, a similar matrix was developed by Terryn (2016: 215) to fit a spatial planning evaluation framework.

Within our search for a governance framework, we focused on the actors and the setting (cf. Section 2.2). Therefore, we also rearranged the axes of the matrix in Figure 10, into the complexity of the setting versus the complexity of the actor field,

see Figure 11. The setting represents the institutional context: not only the planning project (the problem to solve), but also the institutional atmosphere in which to plan, including cultural aspects, planning instruments and rules, etc. The actor complexity mirrors the actor playing field and relates to the dynamic interactions between the actors and their networks (actor networks). It deals with the actors and their prominence in the planning process, as roles and (power) relations can change during the process. The proposed four extremes are: path dependent, adaptive, collaborative, and co-evolutionary.

If we adopt a path dependent governance strategy for solving mobility issues, we start from a fixed actor field and a stable context. The solutions seems clear and can be found in a technical or financial fix. The path dependent strategy therefore relates to the earlier mentioned technical realm in planning (or governing). *If a road is structurally congested by car traffic, the solution according to this strategy would provide additional infrastructure (lanes). The problem definition is not well-elaborated and a quick fix is found in a technical infrastructural solution.*

An adaptive strategy is mostly embraced when dealing with mobility issues that are characterised by a relatively stable actor field in a highly changing and uncertain setting. The planning object, or the system is new or changing. The adaptive strategy thus looks for updating the planned reality to the short- or long-term needs. As such, scenario planning can be seen as an adaptive strategy, but also strategies that target the conditions are part of an adaptive solution.

If a road is structurally congested by car traffic, the solution from an adaptive approach would develop a long-term vision and could come up with for instance the implementation of a low emission zone or congestion charge, that tries to influence the situation starting from the conditions.

With a relatively fixed planning setting, but an unstable actor field, a collaborative governance approach offers a suitable solution. That kind of governance concentrates on shaping alliances and getting the actors on the same page. Correspondingly, the collaborative planning era did not steal its name.

An urban road is structurally congested by car-traffic. A collaborative approach brings the actors together and tries to determine the problem definition, by focusing on the conditions, or the setting, so that it becomes shared by all involved actors. Local inhabitants, for instance, mention the problem of air quality and traffic unsafety. While local shop owners blame it to the harmful parking policy that does not take into account their customers' parking needs. Still others mention the lack of a separate tram lane so that the tram is not beneficial to the car. When we combine those claims in a shared vision, we focus on a fixed setting as solution. A collaborative approach then comes up with for instance a change of the infrastructure design so that it suits the actors. A city boulevard concept might be proposed, that provides separate tram lanes, cycling paths, and short-term parking places here and there. The actors are gathered around their specific city boulevard project.

Finally, when both features are volatile, both the actor field and the planning setting, a co-evolutionary approach could be suggested, that allows to grasp the

encountered complexity without entailing a standstill. The transition management and the reflexive governance are interesting concepts that adopt a notion of co-evolution.

An urban road is structurally congested by car-traffic. A co-evolutionary approach starts by gathering the major actors and by brainstorming about plausible future settings (and changes). Suppose the actors come up with the same claims and problems as in the previous example (cf. collaborative strategy). In that case a co-evolutionary strategy allows the actor playing field and settings to be dynamic. The solution does not come up with one fixed adaptation of the setting, but allows a dynamic (present and future) implementation. Maybe the design should not be entirely fixed or concreted for the following decades, but leave some room for a flexible setting. An updated (but still flexible) transport circulation plan might already resolve part of the problem. Some local shops might be encouraged to relocate to more suitable places. To counter traffic safety issues some places could be subject to speed limits.

We applied the four strategies to the same example: the problem of a congested (urban) road. We did this to illustrate and compare the differences between each of the approaches when looking for solutions. But of course, it is not a question of what is the better approach in this case. The appropriate question is, given the nature of both actor field and setting for each specific case, what the most suitable approach is. Each approach can prove useful, when applied in the appropriate context (cf. Figure 11). Nevertheless, we consider sustainable mobility as a complex adaptive system, that is characterised by a dynamic actor field and setting. Consequently, we prescribe a co-evolutionary mobility governance approach as most appropriate. We elaborate on what such approach means for mobility planners.

2.4

Building a theoretical Framework: the application towards a sustainable mobility system

This section articulates the theoretical findings from previous sections to address the orgware agenda for mobility. A summary of theoretical concepts is given, combining all of those theories and applying them to mobility. The theoretical framework, presented in this section, has been previously published as Van Brussel, Boelens, and Lauwers (2016).

Hitherto, no clear image exists of the associations and interactions between the various mobility-related actors, organisations, and institutions. Various mobility innovations of a socio-technical nature or new citizen's initiatives challenge governing mobility. Governance used to adopt either an engineering approach or a collaborative planning approach. But, both approaches have been contested as they could not offer the intended solutions, cf. previous sections 2.3.1 and 2.3.2 (Boonstra and Boelens 2011, Hertogh and Westerveld 2010, Boussauw and Boelens 2015).

Those approaches introduce linear and incremental strategies to overcome complexity, only by reducing it. While that accommodates complexity in decision-making even more (Teisman, van Buuren, and Gerrits 2009, Hertogh and Westerveld 2010). In practice, most projects or innovations do not evolve in a linear fashion; the number of actors is not predictable, nor are their aspired objectives. As a consequence, a more engaged approach of mobility planning is necessary to grasp the associated level of complexity (Boelens and De Roo 2014).

In Section 2.2, therefore, the focus lies on the actors, their actor networks, and the relation of those actor networks with their setting, or thus the governance paths (cf. EGT). The dynamic (sub)systems, shaped by the aggregation of actor networks, could benefit from a co-evolutionary (Beunen, Van Assche, and Duineveld 2015) and an actor-relational approach of steering as an inclusive process of “undefined becoming” (Boelens and De Roo 2014). Consequently, challenges must be tackled in a dynamic, contingent, and situational context (Hillier, Van Wezemaal, and de Roo 2012). Furthermore, the complex context should not be neglected, as it shapes the institutional, and eventually, the governance paths of actors and subsystems. Van Assche, Beunen et al. (2011) argue that the governance paths of systems are subject to constraints of multiple dependencies. Paths can be determined by their past (path dependent). They can be interdependent if the governance paths of different subsystems cultivate crossovers, or if systems interfere with their environment. Governance paths that are goal-dependent consist of actors and institutions that strive a shared vision and hence will decide the future path (Van Assche, Beunen, and Duineveld 2013).

We perceive complex decision-making as hardly fixed or predictable, but instead as situational and co-evolving (cf. Section 2.3); it is about dynamic insights to deal with social changes in the outer world; it differs fundamentally at various moments in time and space (Bovaird 2008). Complex planning problems cannot be solved by the traditional path dependent approach of problem definition, analysis and solution, in sequential steps, but by adopting a more complex adaptive way of governing (Rittel and Webber 1973).

The here proposed governance starts from considering mobility as a complex adaptive system, comprising mobility arenas in which the stake- and shareholders associate and act. The approach accounts for their intentions and ambitions, but also shapes the setting for transition. The arenas refer to the subsystems or markets within the mobility system in which actors co-act. On the one hand, steering mobility refers to intervening in the interactions between the actors and between the mobility arenas. We use Luhmann’s concept of “structural coupling” to clarify the link between these (internal) interactions to an overall steering capacity or decision-making (Luhmann 1997). On the other hand, steering implies manoeuvring from the outside-in (Boelens 2010), by shaping the fruitful conditions for transition. Our ambition is to apply this two-tiers orgware to optimize the Flemish mobility system. Therefore, the present mobility orgware has to be unravelled first. Which underlying arenas and associated key actors can be defined? Conducting case study research is unavoidable to analyse the added value of such orgware approach. Since the proposed framework calls for situational solutions (i.e. specific in space and time).

2.4.1

Mobility as complex adaptive system

Regarding the quest for a mobility transition, we emphasised the need to add an orgware agenda and regard mobility in a more systemic way, as a complex adaptive system. Therefore, we start this section with the selection of a systemic conceptualisation of mobility, that fits a CAS approach of mobility. We defined CAS as a “complex macroscopic collection of relatively similar, connected micro-structures, formed to adapt to a changing environment” (Cohen, Riolo, and Axelrod 1999, Stacey 2001). CASs are *complex* because they comprise a dynamic network of interactions. Their relationships are not simply an aggregate of individual static entities, but a dynamic network of interpersonal, functional or heterogeneous interactions. CASs are *adaptive*, since the collective behaviour co-evolves with the changing environment and evolving features of the subsystem itself (Solvit 2012, Holland 1992).

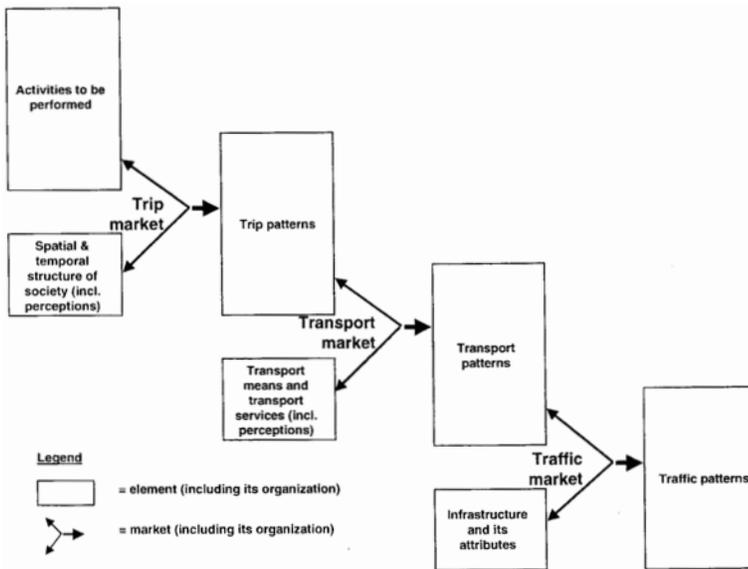


Figure 12 System diagram for mobility. Source: Egeter and van de Riet (1998).

To conceptualise a mobility CAS, we draw on several systemic mobility approaches. Egeter and van de Riet (1998) have experimented with the system approach of the Dutch mobility; they focused on the interplay between the *demand side* (socio-economic attitudes, trends) and *supply side* of mobility (technological and infrastructural means, providers and political strategies). They distinguished a *travel market* (the travel volume, depending on socio-demographic factors, spatial density, diversity, telecommunication, etc.), a *transport market* (depending on the modal choice, system efficiencies, transport information, and communication etc.), and a *traffic market* (depending on traffic efficiency, infrastructure design, vehicle technology, etc.).

Later, Lauwers and Allaert (2013) added the subsystems of the available *resources* (economic, ecologic, spatial) versus their *impacts* (environment, quality of life, etc.) to the scheme, see Figure 13. Furthermore, each of these markets can be considered as CAS themselves. This makes the multi-CAS model of sustainable mobility even more complex; it becomes impossible to oversee all its interconnected features, let alone the impacts of intended proposals on each of them.

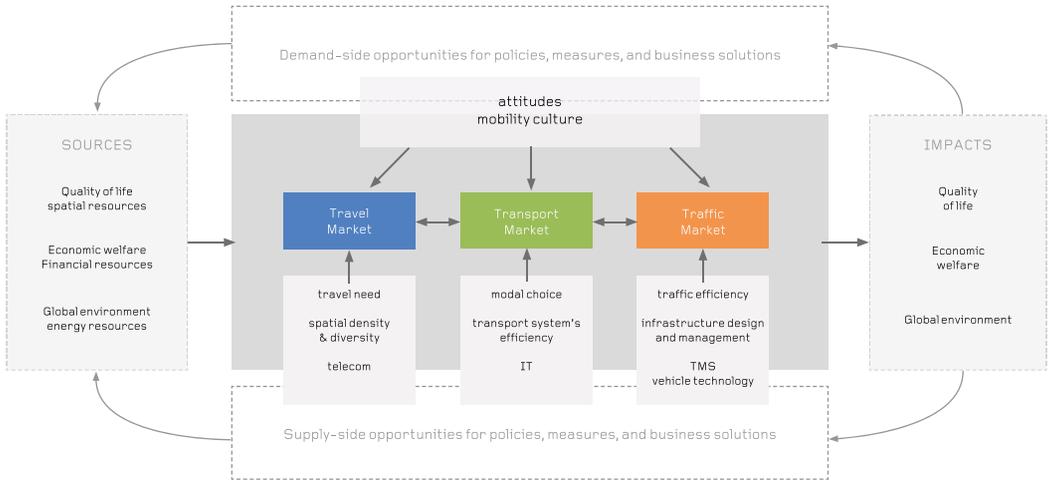


Figure 13 Mobility arenas and their embedding in the environment. Source: based on Lauwers and Allaert (2013).

A mobility system can be regarded as a CAS, within the greater societal/environmental system, but also on micro-level. It consists of various dynamic features, influencing each other continuously: socio-demographic factors, macro and micro-economic trends, socio-cultural trends, the pluralisation of life- and subsequent mobility styles, the impact on pollution and health, technological and logistic innovations, and the respective policies. Hence, researching mobility has become increasingly complex. Additional insights are needed on each of the features mentioned above, and in the reciprocal interactions between them, to elaborate on the orgware, and effectively govern the mobility system (Williams 2005: 11-12).

2.4.2

Two-tier steering of complex adaptive systems

It is not our intention to reduce complexity by dividing mobility into multiple mobility subsystems or arenas. But we think it might help clarify the orgware components and their interactions or feedback loops. Especially when we want to analyse possibilities to “steer” those CAS and tackle its wicked problems, those markets can be understood as Luhmann’s “islands of reduced complexity”, when considered on their own. Each of those subsystems operates relatively self-centred to arrange a level of stability within a chaotic surrounding world, by a systematic selection, interpretation and structuration (Luhmann 1997). Although all of these subsystems evolve relatively closed, and are driven by a self-steering focus, Luhmann sees them as open systems; not only other actors or subsystems exert pressures (external), but the subsystem is also challenged by internal pressures.

But how can those systems be steered? Complexity theorists and system theorist remain sceptical about direct forms of steering, as self-organising processes and co-evolution cannot be orchestrated. But, there are still opportunities for an indirect steering. Therefore, the idea of “structural couplings” is borrowed from Luhmann’s work on conceptualising “the social” (Luhmann 1997). Governing then means creating those “*structural couplings*” between sub-systems. In this respect, Fuchs (2001) presents the role of the planner as an active and constructive role; the planner is perceived as a person who digs deeper, manoeuvres and connects the actors and the subsystems (Fuchs 2001: 39-42,332), this aligns with what Hertogh and Westerveld (2010) propose in their research titled “Playing with Complexity”. But also intermediary organisations, often called “innovation intermediaries” or “innovation brokers” (Klerkx & Leeuwis, 2009) can take up this role. Sometimes, “these innovation intermediaries emerge in response to a perceived suboptimal degree of connectivity between relevant actors...” (Johnson, 2008; Smits & Kuhlmann, 2004). The challenge then remains to establish and embed those intermediary organisations in the existing structure (Klerkx & Leeuwis, 2009). Therefore, we point to a second steering mechanism that occurs at the level of the subsystems. The latter steering should focus on setting the specific conditions to direct the subsystems and their actor networks. With conditions we mean the context that is to be planned, but also the institutional framework, the formal and informal institutions that can be stimulated. It refers to the content of present and future plans, but it goes beyond that plan. It addresses the attitudes, the behaviour, etc. Nevertheless, Luhmann advocates for a steering that benefits from, and does not eliminate the differences between the subsystems (Van Assche and Verschraegen 2008: 274).

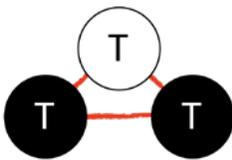
In summary, governance of complex adaptive systems concentrates on realising two main objectives. First, from an inside perspective, governance should intervene in the subsystems and their actor networks. So that structural couplings and alliances can be forged. Second, from an outside perspective, governance can shape the necessary conditions to allow these structural couplings to come into existence. A comprehensive rational steering is opposed, as that does not enable to come up with tailor-made solutions (see quote below). Furthermore, we are not only interested in the actors or the conditions, but also in their interactions. The latter interactions, or that kind of structural embeddedness relates to the actor’s or subsystem’s governance paths (Van Assche, Beunen et al. 2011). That can be considered as a higher order structural coupling, that creates consistency between the various subsystems. That is why some call it “the art of creating consistency” (Boonstra 2015: 362), cf. Figure 14. To describe and anticipate on those governance paths, the actor networks can be re/deconstructed by digging into the translation phases or ARA steps.

Successful governance is always provisional, localized, and partial and always has unintended consequences which operate to the detriment of other subjects, interest, and projects and may eventually prove counter-productive even for those who instituted the governance mechanisms and projects in question. (Jessop 1997: 133)

2.4.2.1 The art of forging structural couplings

The mobility arenas can be conceived as specific domains of Luhmann's reduced complexity. This is schematically illustrated by presenting an arena as a core surrounded by its environment (see Figure 15). The subsystems however should always be regarded as open systems, consisting of many actor networks that are not necessarily tied to only one subsystem. Earlier we have elaborated on how actors and institutions can be conceptualised, drawing on the actor network theory and institutional theories (cf. section 2.2.1 and 2.2.2). Remember that those networks are never static. They might be interwoven with many more networks, thus, exerting different influences. Since no one can oversee all of these changing actor networks, ANT proposes to penetrate into the smallest elements: to trace the actors, their routines, ambitions, and interests. It is hereby useful to distinguish business (focus on profit), civic (focus on self-value), public (reproduction of the given order), and academic actors (knowledge-driven), as it is argued that a mix of those sectors results in more robust actor networks (Scharpf 1997, Boelens 2010). Tracing the actors allows not only to perceive complex situations from the interrelatedness of leading actors, but also to anticipate the impact of future innovations. In that respect, ANT focuses on "*policies in the making*", instead of "*readymade policies*", proposing four phases of translation in which the network gains shape (cf. section 2.2.1) : – problematisation – intersement – enrolment – mobilisation

structural couplings



condition planning

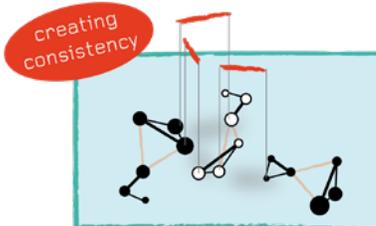
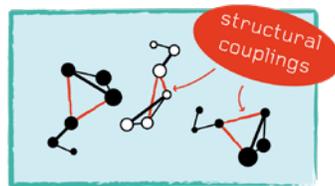
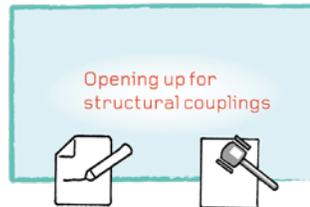


Figure 14 Two tiers approach in planning: forging structural couplings and engaging with condition planning. Source: Van Brussel.

of allies (Callon 1986). Those ideas are also reflected in the transition management approach, where niche innovations aspire to get adopted by the regime actors, and to have an influence on landscape evolutions on the (very) long term (Geels 2002a). Tracing the actor networks reveals emerging alliances and structural couplings at micro-level. On a more aggregated level such structural couplings might imply or provoke structural couplings between the subsystems. The magic happens where the overlap between the subsystems starts (cf. ‘the art of creating consistency’, Boonstra 2015: 362).

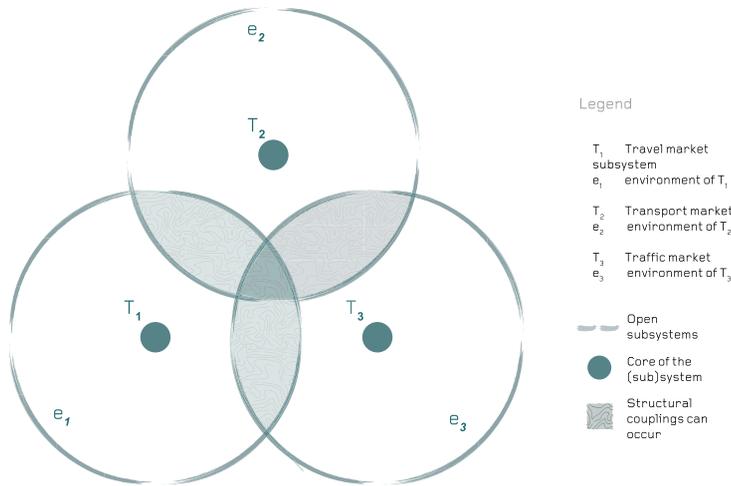


Figure 15 Structural coupling of the subsystems of sustainable mobility. Source: Van Brussel, Boelens, and Lauwers (2016).

2.4.2.2 The art of adaptive condition planning in time and space

Those kinds of structural couplings, that can launch a transition, go hand in hand with an adaptive environment; as those influence the setting themselves. Within complex adaptive systems everything is relational, both the elements (actors) and their institutional context. Consequently everything is “situational”, i.e. specific in space and time. Comprehensive central steering does not work. But that does not eliminate a conditional steering from the outside. As said before, the context determines possible outcomes and is in itself arranged and changed by the actants within the setting, to attain their objectives. Hence we cannot only focus on the structural couplings of actants, while neglecting the broader context of “structural” settings. For Law denotes that actors – thus people, entities, resources – that are connected, only have meaning within and through their network (Law 1986). Hence, we approach the settings as institutions in formal (laws, regulations, policies etc.), informal (norms, codes, cultures etc.), and in differential and heterogeneous sense. Following (Giddens 1984) and (Jessop 2001) the conditions are both constraining and enabling. They refer to the reciprocal relation between agents and institutions (i.e. conditions or structure); institutions are the resources and simultaneously also the means for institutional change. Hence institutional change would not be driven in a one-directional way top-down or bottom-up. Instead, change would be the result of a complex interplay between actors and settings, focusing on an improved embeddedness.

We return to how institutions can change and how such actor-setting embeddedness is shaped. Various levels of embeddedness of social organisation can be distinguished according to institutional theorists (Jessop 2001). First, social embeddedness draws attention to the more symbolic and cognitive dimensions of institutions and attributes institutional change to internal pressures (Olsen and March 1989). The process of institutionalisation can be defined as “a process in which fluid behaviour gradually solidifies into structures, which subsequently structure the behaviour of actors” (Arts and Leroy 2003: 31). Second, functional embeddedness refers to the path dependent perspective on institutions and associates institutional change with path dependent possibilities. In which sequences of (political/economic) change are associated with previous decisions and limited by existing institutions. For in path dependent evolutions a choice made in the past, albeit random or not, has consequences and limits future options. Change is only possible in moments of conjunctures, or “occasional windows of exceptional opportunity” (Wilsford 1994: 252). This view harmonizes with the idea of Burch, Hogwood et al. (2003), and Kingdon (1995) on institutional change. But we should not completely let the past shape the future, nor should we wait for the “right” internal social pressure to stimulate conditions to change. A third more differential embeddedness is required. A kind of embeddedness that addresses the situation and interferes with the setting to open a window of opportunity. Condition planning in this sense not only becomes dynamic and focused in the specific course of transition, but also undefined; this planning tries to induce actions in a certain direction, but can never foresee if the outcome will be as expected.

2.4.3

Let's reconstruct the orgware: towards operationalisation

The two-tiers approach focuses on (1) forging structural couplings and creating consistency amongst the various subsystems, and simultaneously on (2) facilitating these couplings by re-arranging the setting. How do we analyse who is playing the most central role, who is connected to whom, who the intermediaries or mediators were to forge the necessary structural couplings, etc.?

Materialising or visualising the mobility orgware is, in our opinion, important to formulate an orgware agenda. We therefore suggest to reconstruct the translating actor networks regarding mobility transitions. We start from the ANT and the translation phases, but we focus on the key actors and differentiate among business, civil, public, and knowledge actors cf. ARA. As it is shown that mixed strategic partnerships are more robust. When going through the actor network translation phases, each time adding a layer of the actor network, we account for path-dependency, as we the case story continuously develops. From the multilevel perspective in transition management theories, we also differentiated the actors according to niche, regime, or landscape actors. We interpreted those categories based on Geels (2002b) as follows. Niche actors are innovations or novel actors that challenge the present regime actors. They do not possess the means for decision-making, they focus on agenda setting instead, and on influencing the chosen policies. Regime actors are rule-defining, they are setting out the main course of the process and they manage the power and instruments. Landscape actors or factors are external to the project or process we describe, but can still

exert some influence. For instance governmental actors at other levels also do have an indirect influence on the cases and can as such be defined as landscape actors. Representing these levels, e.g. whether or not an actor's initiative or a project is already institutionalized (part of the regime) or not, can be interesting in order to define or estimate the capacity to change and the accessibility to resources as a means for change. Figure 16 illustrates the proposed method and legend for the unravelling the orgware.

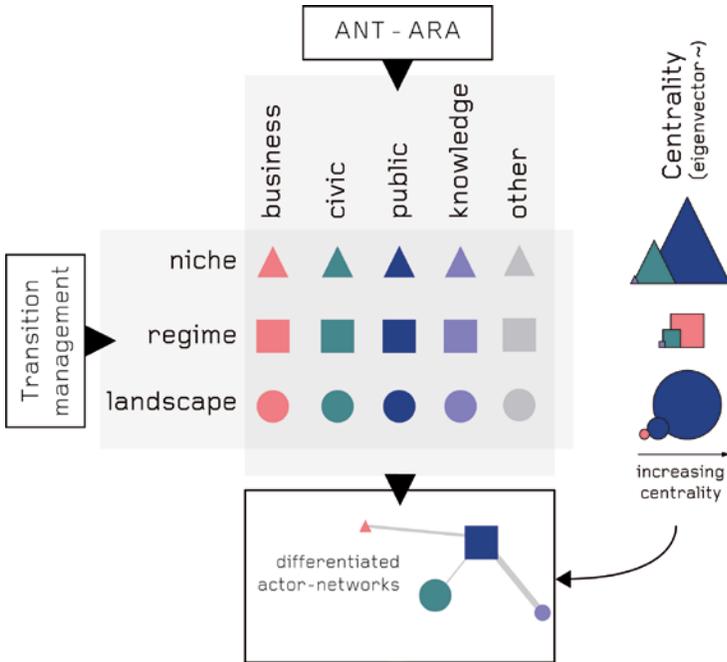


Figure 16 Elements for deconstructing the orgware into differentiated actor networks. Source: Van Brussel.



Methodology



In the previous chapters we provided a systemic conceptualisation of mobility that enabled us to depart from the various subsystems, actor networks, and their interrelations. We found that mobility issues often become wicked problems, that challenge the present governance arrangements. Our hypothesis is that the mobility orgware in those circumstances might benefit from a co-evolutionary governance approach. To answer the research question – *What can an orgware agenda add to hard- and software solutions tackling complex mobility issues?* – we proposed to look at a two-tiers steering framework: (1) forging structural couplings and (2) interfering in the institutional context or the conditions. In this chapter we discuss the specific methods to operationalise that theoretical framework.

3.1

Multiple case study research

A governance approach that suits the encountered complexity is related to a specific situation. There are no one-size-fits-all solutions available. Therefore, and for several other reasons, we adopted a multiple case study method. First, our research question has an exploratory nature, asking about ‘*how*’ to steer etc. In-depth case studies can offer substantial information to answer those questions. Second, as researcher, we have little or no control over the subject of analysis: i.e. the mobility governance. We cannot manipulate and isolate relevant actor behaviours or planning processes to see what is successful in practice and what fails. Hence, we are almost obliged to carry out case study research, as in fact “there appears to exist only context-dependent knowledge” (Flyvbjerg 2006: 221). Although, a gamification or experimental setup with existent actors of the mobility field in a role play, or an actual living lab as experiment, could also have fit this kind of research question. Third, we want to observe the cases in their context, so we arrive at a certain closeness to the real-life situation. Those characteristics are more associated with case study research than to other known qualitative research methods (survey, experiment or history) (Flyvbjerg 2006: 223, Farthing 2016). Lastly, there is little prior research that has attempted to materialise the orgware and unravel the mobility governance, nor in any other governance field that we know of. So we have to explore and gather our own data.

A case study is an empirical enquiry that investigates a contemporary phenomenon (‘the case’) in depth and within its real world context, especially when the boundaries between phenomenon and context may not clearly be evident. (Yin 2014: 16)

In Section 2.4, we have built a theoretical governance framework, based on the literature review on governance and planning in complex environments (cf. Chapter 2). The respective underlying hypothesis of our research suggests that present governance strategies do not proof effective in the complex real world. As they are challenged by new stakeholders or dynamic conditions. We thus propose a matrix of four governance strategies that each address a specific situation of actor field (static versus dynamic) and setting (static versus dynamic) to plan for (Hertogh

and Westerveld 2010, Boelens 2015). A complex situation characterised by a dynamic actor field and a dynamic setting, calls for a co-evolutionary approach. We hypothesize that governance of mobility often fails as it does not address or respond to the encountered complexity. We thus try to derive what kind of governance approach or governance path they follow/followed, and what a co-evolutionary approach could offer/have offered.

By conducting case study research, we derive detailed governance understandings on both the actor field, the institutional setting and the followed governance approach (cf. matrix). Our perspective on governing complexity calls for situational understanding and tailor made solutions, which standard formulas and stable solutions do not exhibit. But that does not mean that this in-depth information cannot be of use elsewhere. We think there will be certain lessons that can be learned, some do's and don'ts that can be applied and tested in other (future) cases.

3.2

Selection of cases

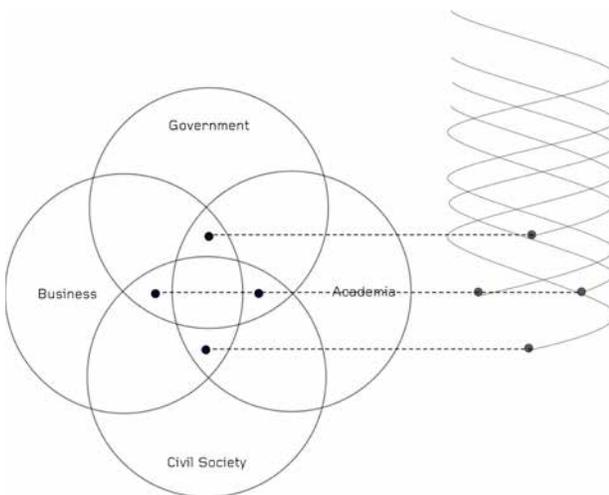


Figure 17 Quadruple helix scheme. Source: based on Carayannis and Campbell (2009).

There are several ways or strategies to select cases for analysis, e.g. by Flyvbjerg (2006: 230). He distinguishes between a random and an information-oriented based sampling. The most suited strategy depends on the main research aim. This research aspires to shed light on different governance processes that are dealing with the mobility transition, by focusing on actor network constellations and their interplay with the setting. A random sampling will thus not help us gather the specific and diverse information we are looking for.

Several questions guide the direction in which to look for case studies. Which cases enable the study of a broad orgware agenda for the governance of mobility? Is every initiating party, whether from business, civil, public or knowledge sector, even

successful in rearranging the governance of mobility? Who were the game changers? What can be the various roles and relations? In the last decade, two major threads emerged regarding governing mobility and rearranging the way to deal with mobility issues. First, in the mid-nineties the planning process of the large and complex infrastructure project Oosterweel Link started (and is currently still ongoing) and has become a story of a diverse range of actors. Second, in 2015, the switch was made from “basic mobility” (supply-side oriented) towards “basic accessibility” (demand-side oriented). To implement this concept or transition, intergovernmental or regional mobility cooperations have been developed (public initiative), called pilot transport regions (*vervoerregios*). We included those two processes in our research. Where the cases gave rise, or referred to, other relevant examples, we selected them as well (snowball sampling). We ended up with three cases per major mobility storyline. Figure 18 illustrates the (chrono)logic of the cases (and sub-cases) and the way they are associated.

In Section 2.3, we stated that governance is increasingly understood as the interplay between all kinds of actors; that it is no longer the sole responsibility of governmental actors. Therefore, it is interesting that all selected cases and subcases can be positioned in the quadruple helix to some extent (cf. Figure 17); a concept that is often presented as one of the ingredients for a “successful” transition; it proposes the combination and engagement in strategic partnerships of business, civil, public, and knowledge sector (cf. quadruple helix scheme by Carayannis and Campbell 2009). As governance is not the sole responsibility of governmental actors any longer, in addition, civil, business, and academic initiatives and developments gain importance. Therefore, we selected a large infrastructure project and several upcoming governance concepts or initiatives from various nature (civic, public, knowledge, and business). We are interested in exploring the differences between their strategies, and interaction with the setting, which results in their governance paths.

Chapter 5 deals with the rise of regional mobility cooperation in Flanders and the more recent establishment of transport regions. The roots for the transport region discussion were already present in the SLUIZO/MOZO story. But the concept only reached maturity years later, with the actual transport regions (*Vervoerregios*). The transport regions were established in a few pilots, of which Mechelen and Antwerp will be discussed in particular. Here and there, the setup of a marketplace for mobility was considered. Such a marketplace for mobility had earlier been materialized and implemented by De Verkeersonderneming (the VO) in Rotterdam. Therefore the VO was incorporated as a third case in chapter 6. Besides, in the case of the regional mobility cooperation, explicit reference was made to the VO. Chapter 7 presents the history of the large infrastructure project of the Oosterweel Link. The governmental side (BAM) and the opposition side of the citizen movements are merged into one wicked story with many sub storylines or translation rounds.

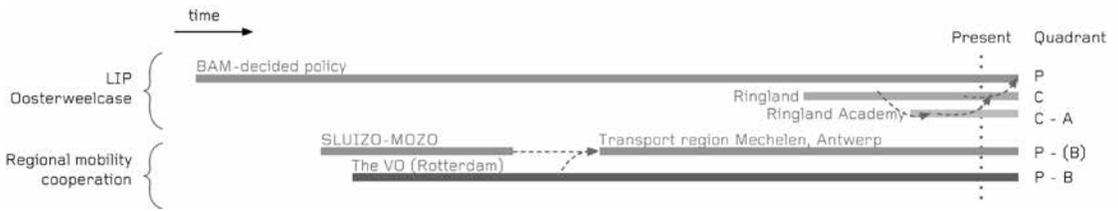


Figure 18 Chronologic of the selected case studies their interrelations and the quadrant of the quadruple helix in which they arose.

3.3

Data collection and analysis

The two-tiers approach proposes to reconstruct the cases, by focusing on the actors and the institutional context. To enable the case stories to become more clear and neutral, different information channels are mixed and mastered; personal perspectives and noise are filtered. In our case, this so-called triangulation requires combining insights from policy documents, the information retrieved from stakeholder interviews, and additional expert interviews for a more external perspective (Yin 2014).

Since the cases belong to different storylines, also the data acquisition methods vary slightly (cf. overview in Table 1). Most data on governance, actor constellations, and priorities were gathered through interviews. Interviewees were selected based on a short screening of reports or other documents and press coverage of the case. During the interviews reference was often made to other relevant actors to interview, so they were interviewed where possible as well (snowball sampling). We preferred unstructured interviews as we wanted to gather as much detail as possible. Besides, such interviews reveal the true priorities and focal points of the various relevant actors. What they consider more important is more prominent in the interview and transcript. However, during the interviews a set of minimum topics (guidelines) was to be covered; the order and length of the answers or story did not matter (cf. Yin 2014). The transcripts of the interviews can be retrieved from the author.

The interviews were conducted to reconstruct the case's history. Questions were introduced to get insights about the origins of the proposed project or governance innovation, about setting the agenda, building alliances, etc. We also asked about the weaknesses and opportunities of the alliances, and the roles of the actors. The questions were adjusted to fit the background of the specific interviewee to deliver as much information as possible. The order of the topics varied dependent on the flow of the conversation and the logical place to introduce them elegantly. The interviews were conceived as open non-structured interviews, so other questions, personal reflections or remarks were added here and there. Where relevant and possible, interviewees were asked about their presumed role or position in any of

Table 1 Cases and Case specific methods for data acquisition and analysis

| Case | Actors | Scope of the case | Year | Type of RQ | Data acquisition | Data analysis |
|---|---|---|-----------|--------------------------|---|---|
| <i>First storyline: towards regional mobility cooperation, developing transport regions</i> | | | | | | |
| 1 SLUIZO/MOZO | DMOW, Lokale besturen, Provincie Antwerpen | SLUIZO study, MOZO platform | 2008-2012 | exploratory, explanatory | In-depth & unstructured interviews (1-2h) | Sources coded with Nvivo software, gathered in an Access DB |
| 2 C-AR/Transport region Mechelen | IGEMO, DMOW, Lokale besturen | Mobility Market Mechelen | 2016-... | exploratory | In-depth & unstructured interviews (1-2h) | Sources coded with Nvivo software, gathered in an Access DB |
| 3 Verkeersonderzeming Rotterdam | HbR, Gemeente Rotterdam, MRDH, IenM, RWS | Mobility Market Rotterdam | 2008-... | exploratory, explanatory | In-depth & unstructured interviews (1-2h) | Sources coded with Nvivo software, gathered in an Access DB |
| <i>Second storyline: planning for a large infrastructure project</i> | | | | | | |
| 4 Oosterweel Link | BAM (starting phases en point of view from the political perspective and the BAM) | LIP Oosterweel Link project process | 1995-... | exploratory | Source analysis (parliamentary documents), in-depth & unstructured interviews, roundtable discussion | Sources coded with Nvivo software, gathered in an Access DB |
| 5 Ringland | Ringland (phase of active citizen movements and their evolution) | Position of Ringland within LIP Oosterweel Link | 2012-2015 | exploratory | Ethnographic research (with respect to formal and informal or daily activities and email correspondence), roundtable discussion | Sources coded with Nvivo software, gathered in an Access DB |
| 6 Ringland Academy | Ringland Academy (VUB, KULeuven, UA, City of Antwerp) | CurieuzNeuzen citizen science project | 2016 | | Citizen science project (air quality data and survey on participants' motives, learning and attitudes) | Quantitative and qualitative |

the other cases that were included in our research. A list of the interviewees or involved persons and the specific questions and topics to be discussed is provided per case in Appendix 1. Those interviews were complemented by source analysis of project reports and minutes and (popular) press coverage. Sometimes, either interviewing was not possible¹³, because there was too little or even no response to individual interview proposals, or, conducting interviews would be too time-consuming. In that case, other ways were pursued: roundtable discussions, source analysis of parliamentary committee minutes. For instance, in the case of Oosterweel, interview proposals addressing the project management company were not responded¹⁴, and interviewing all relevant actors would be too time-consuming. Considering those aspects, the analysis was based on the parliamentary committee minutes of the project and its progress in the parliamentary commission of mobility and public works (Flemish Parliament). The advantages of these sources is the frequency and the level of detail of those reports. They do not only reflect what the discussions were about (focal points). But they also provided insights in the actors that were invited at certain points in history. The reports are transcribed and often detailed annual reports of the project or other annexes are added. These sources can thus be easily screened for actors and themes with specific software packages such as NVivo, to allow an objective data handling afterwards. The parliamentary committee minutes we selected and their distribution over time are listed in Table 15 (see appendix 2). Where it was possible to reveal even more details, which was the case with the Ringland initiative, an ethnographic approach was adopted. The Ringland movement provided me access to formal and informal meetings and meeting minutes, daily activities and (past and present) email correspondence. From the shadows, I could observe the daily Ringland tactics, how they dealt with the encountered challenges, how they answered the fierce “opponents” of their project, who they were planning to have a meeting with, the strategy that applied, and the topic the meeting would be about, and this on a daily basis; the Ringland actor network came to live.

The gathered and transcribed interview and source data were stored and processed in NVivo Qualitative Data Analysis Software; QSR International Pty Ltd. Version 11. This database environment allows a swift querying and data manipulation. While coding the transcript or text, the prevailing themes of discussion and the occurring actors in the case were respected. The themes of discussion focussed on complexity aspects as mentioned in earlier literature sections. *How is the variety of actors dealt with, the opposition, the uncertain future, etc.?* Aspects that relate to the technical, financial, procedural or juridical, social, organisational and time components of complexity.

To examine the institutional context and the interplay with the actors, the translation process (cf. ANT) can be screened for windows of opportunity. In those

13 within the limited time frame of the research

14 Besides, some actors have quit the case's scene or the political scene in general, which makes it difficult to trace the actors in the first place. Sometimes, actors showed interest and tried to arrange an interview, but the actual meeting never took place, despite all the efforts (e.g. Intendant A. D'Hooghe, Governor C. Bex).

moments necessary structural couplings are forged that are visible in the actor networks. Governance paths of actors become clear, and formal and informal changes in the conditions can be at the basis of those windows of opportunity.

3.4

Visualising the results

3.4.1

Related work using social network analysis

Due to a personal predilection for maps and quantitative data, the case study research entails more than storytelling, a more “objective” materialisation was strived. Therefore, a social network analysis (SNA) approach has been settled for, because it allows both processing and mapping the qualitative data as if they were quantitative. Mapping the interactions between actors is a well-known method to study networks, and thus governance patterns (Klijn 2008). The regional differences in SNA research techniques and traditions have been discerned by Marcussen and Olsen (2007). In Europe, studying governance by use of SNA is rather rare. Instead, preference is given to more qualitative research-oriented methods like case studies and discourse analyses. In contrast, in the USA, social network analysis and other more quantitative methods prevail. Marcussen and Olsen (2007) argue that both traditions develop separately, with only few cross-references made to one another. But, that qualitative versus quantitative division misses the point, since more can be unravelled when both techniques are combined.

Social network analysis and the concept of “network governance” is often referred to in the economic fields, in innovation literature, and in public management literature (Jones, Hesterly, and Borgatti 1997). Hence, also the visualisation of those networks remains in the business or management sphere: the governance of (micro)-economies (e.g. in Marin and Berkes 2010, Pryke 2005). Visualisations of business networks typically show the spatial clusters that have emerged. The results demonstrate to what extent the found network structure enables firm innovation and performance (e.g. Bringmann, Verhetsel et al. 2013). In transport or mobility planning, using social network analysis to enhance insights in governance constellations is rather unique to our knowledge. Here and there, network analysis might be performed for analysing the infrastructure network performance or hierarchy (i.a. El-adaway, Abotaleb, and Vechan 2016, Huang, Zhu et al. 2016, Schwanen 2017). But visualising the governance networks of mobility planning remains an extraordinary undertaking. We are convinced that visualising and materialising the networks can add objectivity to the cases. It can reveal interesting patterns for successful governance, regarding actors and conditions.

3.4.2

Social network analysis and mobility governance – visualising the translation process

3.4.2.1 Data acquisition: nodes and connections

For each case the origins and leading actors are traced and the actor network is reconstructed over time (cf. ANT translation phases). Where the case is too complex a time line is provided, to get an overview of the conditions and institutional context. It should come as no surprise that an actor network diagram is the representation or visualisation of an actor in his network – or thus the actor network. The nodes in the network represent the key actors or key factors of the case. These nodes are connected to one another by ties, making it a network, or more precisely an actor network. Those ties cover a diverse range of relations (social, business, financial, etc.) that are specified in the documents or interviews on which our data is based.

Figure 19 illustrates how the gathered data is converted into actor network diagrams. After having conducted the interviews or having selected the relevant documents, the transcripts and/or documents are coded at different actors (nodes), and a list of the actual connections between the relevant actors is composed. The data was transferred from NVivo to a database environment (Access) for a proper data management and for attributing additional parameters to the coded actors and themes specifying the actors.

To maintain a proper overview on the governance constellations, the dataset is restricted to a selection of actors, specified for each case (based on frequency in sources or documents). The selection criteria and selected actors are elaborated in more detail per case in Appendix 2. For the simplicity of the final visualisation we merged the actors that obviously belong to the same “parent” organisation. Suppose there is information coded at the level of individual members of the parliamentary commission of mobility and public works (Flemish parliament). Those individuals will be merged under their common denominator: the commission of mobility and public works.

The presence of network ties or connections between actors is based on the source or interview data, own experience, and common knowledge. E.g. member of the same political party have a presumed connection, people who worked for other people or organisations that are also in the diagram are also connected, etc. Note that the presence of a connection in the actor network diagram is always tied to the end-situation. This is also the case for the size of the displayed nodes (cf. centrality). A more dynamic mapping of the evolution of the actor networks over time would be interesting, but was not possible in this research for several reasons. First, No in-depth information on the specific number and intensity of connections between actors was available, nor was their variation over time; or at least not for the scale of these cases. Secondly, therefore it was also not very opportune to vary the actors over time and see how their position in the network changed and their centrality increased or decreased. Third, if the latter issues could be resolved, then a real dynamic mapping would still be a very time-consuming undertaking, as it would require connection matrixes for each year. Fourth, by reconstructing

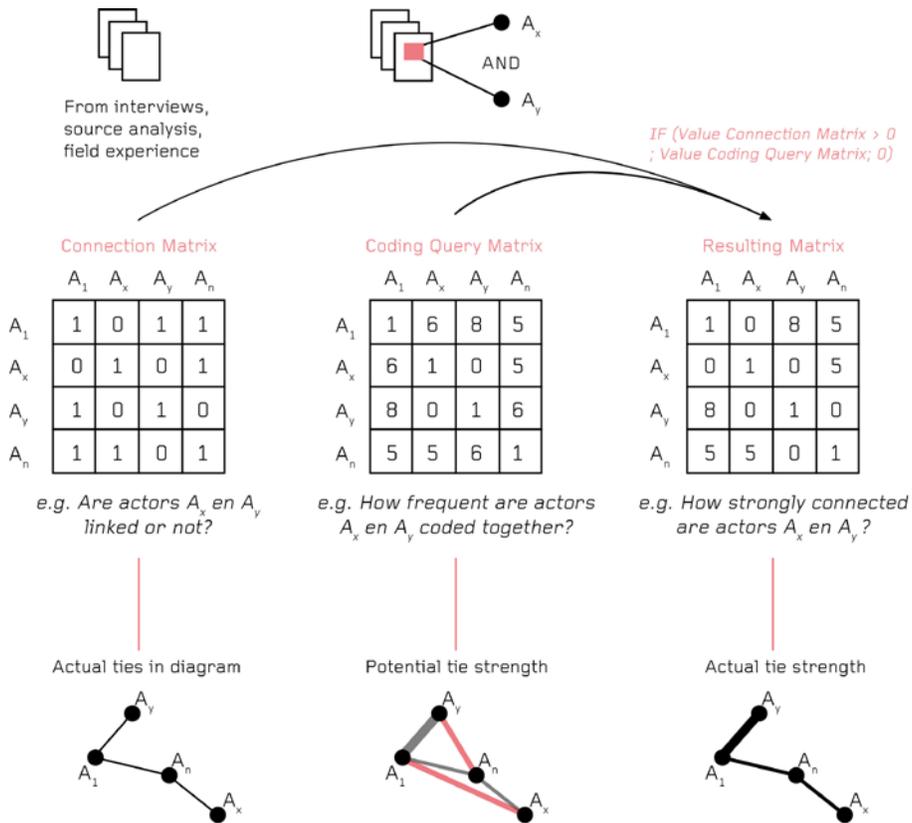


Figure 19 Schematic overview of how the actor network diagram is generated.

– or deconstructing – the final¹⁵ situation, the actor network diagrams allowed a straightforward reading and showed how subnetworks rose and connected towards other subnetworks or actors. Hence, we are convinced that reconstructing the end situation still provides valid information with regard to our orgware agenda.

3.4.2.2 Data handling for visualisation

The actors and their connections (stored in the attribute “connections”) are converted into a connection matrix by a script run in VBA. After composing the connection matrix, and accounting for possible omitted connections by symmetrising the matrix (maxsym principle), a cross check is run in NVivo to estimate the intensity of the connections. For each (f)actor, the matrix coding query reveals the frequency that the (f)actor is coded together with all of the other (f)actors. This illustrates the strength or intensity of the connections. Afterwards, we still have to correct for the actors that have been coded together by coincidence,¹⁶ but do not have a relevant

¹⁵ or most recent situations, in cases that are still developing

¹⁶ Because of time-efficiency, we coded the documents per paragraph, or even per section in case of large documents. This allowed us to cover more details in less time; the Oosterweel Link case documents, for instance, comprised more than 2000 pages in total.

connection. Both matrices, i.e. the connection matrix and the coding query matrix, are combined in a resulting matrix, cf. Figure 19. This matrix lies at the basis of the actor network diagrams that were generated with the Ucinet-Netdraw social network analysis software package. Besides the straightforward user interface and swift visualisation, this software enables calculating centrality measures for each of the actors in the diagram (Borgatti, Everett, and Johnson 2013).

3.4.2.3 Fine-tuning the visualisations using attributes reflecting our theoretical insights

The visualisations allow a diverse use of parameters for the shape, size, and colour of the actors (nodes), and for the intensity of the connection between the actors. A detailed overview of all actors per case and their corresponding attributes is listed in Appendix 2. The parameter legend is displayed in Figure 20, and exists of following components:

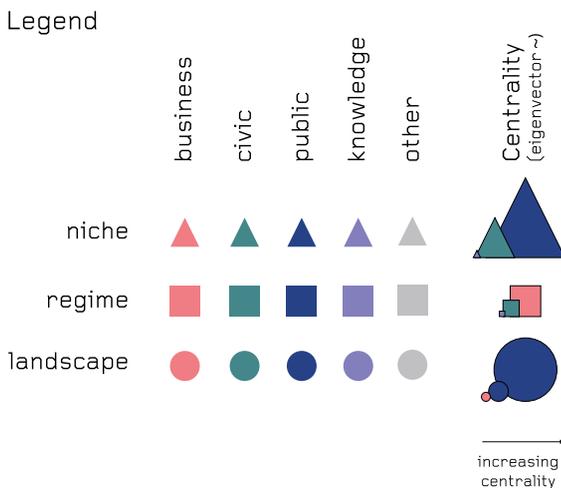


Figure 20 Legend visualisation.

- **Node size:** the size of the actors varies according to their centrality value (eigenvector¹⁷ centrality as calculated by Ucinet SNA software package).
- **Node shape:** the shape of the node reflects its type: niche, regime or landscape actor. Based on transition management theories we interpreted the definitions as follows, so that they become relevant for mapping the actors in our case studies.
 - **Niche** actors are innovations or novel actors that challenge the present regime actors. They do not possess the means for decision-making, they focus on agenda setting, and the influencing of policies.

¹⁷ The eigenvector centrality shows the popularity or well-connectedness of actors, in the sense that actors with a high eigenvector centrality are typically connected to other well-connected actors. It does not just focus on the amount of connections an actor has (i.e. degree centrality), but it also accounts for the amount of its neighbouring actors.

- **Regime** actors are rule-defining, they are setting out the main course of the process and they manage the power and instruments.
- **Landscape** actors or factors are external to the project or process we describe, but still can exert some influence. For instance governmental actors at other levels also do have an indirect influence on the cases and can as such be defined as landscape actors.
- **Node colour:** the colour of the node mirrors its sector: business, civil, public, knowledge actor.



4

The Flemish
mobility and its
relation to
spatial planning
in retrospect



4.1

Transport planning versus spatial development: a brief retrospective

For most part in the past mobility planning, from the 1940's until the 1990's, the planning process was in the hands of engineers, calculating and providing for the necessary (predicted) capacity. After the Second World War, the free movement of persons and goods was installed within Europe, after which an era of new large-scale infrastructure construction works started. Economic welfare was – and often is still – the leitmotif for constructing new infrastructures.

the highway or infrastructure construction in general, serves as a vector of urbanization. (Ryckewaert 2012: 60)

While there was neither an overarching spatial planning vision, nor a legal framework¹⁸, this vacuum was filled by infrastructure planning in Belgium. Road, rail, and water infrastructures mainly served “as an instrument of economic urbanization” (Ryckewaert 2012). At that time, transport planning dominated in relation to spatial planning. Spatial development patterns and “in-between cities” emerged as a result of the infrastructure planning (Ryckewaert 2012, Peleman 2010). Before, the construction of a fine-meshed railway network (*Buurtspoorwegen*) incentivised large-scale suburbanisation, as it allowed people to keep living in the countryside while working in the city agglomerations (De Decker 2011).

The trans-European networks projects and funds, that responded to the European welfare crisis in the mid-nineties, form a more recent example of this “vector for urbanization”. They had to facilitate the increasing flows of goods, people, energy, etc. The potential that these flows would bring dominated the value of the place itself; and thus how it was used and appropriated by locals. It was criticised that the spatial translation was no longer “the space of places” but instead “the space of flows”. In many projects this resulted in different planning scale-levels (global versus local) opposing one another (Albrechts and Coppens 2003).

Since the first law on planning in 1962, the fundamentals had been laid for the spatial planning discipline of today (Albrechts and Meuris 2000). Based on this law, the whole Belgian territory became covered by zoning plans, they destined the land to a specific land use function and associated development. Spatial planning was limited to the elaboration of binding sub-regional, local, and detailed zoning plans (*i.e. Gewestplan*, 1972). But the zoning plans did not reduce the housing sprawl that had already started before, as successive earlier infrastructure works, policy

¹⁸ Except for the rather architectural urbanism tradition, that is often omitted in setting out the planning tradition. That tradition also has developed interesting concepts for urban development even on the scale of cities. However, the impact of those interventions on urban and spatial development was less than the large infrastructure works carried out by civil engineers (Boussauw and Boelens 2015). Unfortunately, that is why not that many words are spent to the urbanist tradition and evolutions in this dissertation either.

decisions and legal acts had been favouring suburban, and later, car-oriented development (De Meulder, Schreurs et al. 1999).

Major spatial planning aims of the RSV include protecting the remaining open countryside, limiting the development of new infrastructure, optimizing the existing infrastructure and densifying urban areas and residential nuclei in the regional outskirts. These principles are nothing new in themselves, but they are a novelty when applied to Flanders. The desired spatial structure is totally contrary to the existing one. (De Meulder, Schreurs et al. 1999: 80).

In 1997, planning adopted a more strategic way of thinking in the Spatial Structure Plan for Flanders (Ruimtelijk Structuurplan Vlaanderen, RSV), formulating a pro-active long-term vision to counteract urban sprawl and the fragmentation of the open space (cf. quote above). The planning concept of “deconcentrated clustering” was put forward, implying that the already spread out urban developments (deconcentrated) were preserved but resisted any further sprawl (clustering). In addition, building on the more communicative planning discourses at that time, it addressed the importance of involving a broad field of actors in the planning process (Albrechts, Healey, & Kunzmann, 2003).

The Spatial Structure Plan for Flanders was soon to be followed by lower-level structure plans for the provinces and municipalities. The plan was considered ambitious and future-oriented, as it strived for a more sustainable spatial development. But after only a few years, the weak points of the plan became apparent. Several policy objectives “proved incompatible with the institutional context” that had been settled in previous decades (Boussauw and Boelens 2015: 6). In addition, the collaborative planning process turned out to be very time-consuming. This was often counteracted by rushing through the procedures to get the plan approved. The RSV became a shadow of what it once had envisioned, cast by a rigid formal structure. Furthermore, from 1999, the disconnect between spatial planning processes and large-scale infrastructure projects (public works) became official, when in contrast to previous political legislations, the two policy fields now had their own minister (Boussauw and Boelens 2015).

Another important evolution that came along with the structure planning was the decentralisation tendency going on in Flanders – as elsewhere (De Decker 2011, Lauwers and Gillis 2010). This led to the shift of the actual power from the regional administrative departments to the provincial branches. Regarding the portfolio of mobility, the decentralisation became apparent with the road categorisation (Lauwers and Gillis 2010). It is important however to distinguish between ownership and control or management over the infrastructure on the one hand, and the functional road categorisation on the other hand. The road infrastructure used to be in the hands of three authorities: the Flemish government, the provinces and the local municipalities. But after the debate on the core tasks between regional, provincial and municipal government levels (*Kerntakendebat*, between 2001 and 2003) in accordance with the administrative agreement of 2003, the province have been transferring that responsibility to the other two government levels¹⁹. The

19 By 2009 all major provincial roads were transferred to the Flemish government.

corresponding management and exploitation associated with those authorities are, respectively, the Flemish Agency for Roads and Traffic (AWV), and the local municipalities themselves.

The preparations for the first Mobility plan for Flanders started in 2001. Two years later, in 2003, the plan was approved²⁰. It concentrated on accessibility with a particular focus on the economic competitive position of Flanders in Europe. Additionally, also the social and ecological pillar of mobility were considered. Sustainability was already adopted in the plan, but would receive much more attention in later plans.

The right to basic mobility²¹ had been initiated in 2003, guaranteeing a minimum public transport supply in even the most sprawled urban areas. At the same time, the prevailing spatial structure plan for Flanders proposed the concept of “deconcentrated clustering”, to resist further sprawl. Moreover the domain of spatial planning was dominated by lawyers and geographic planners, while the domain of mobility was dominated by the civil engineers in Flanders. Both disciplines followed their own path dependencies and acted apart from each other. They often even opposed each other, ignoring their interconnectedness. However, mobility policy itself did not follow a clear path either. On the one hand, the basic mobility decree and the concerning expenses expressed the focus on a qualitative public transport supply. But, on the other hand, tax benefits for company cars were about equally large²², and were even amongst the highest in the world (De Smet 2014). Hence we could speak of a fragmented mobility policy, spanning different arena’s (or scale levels), that lacks a clear discourse and misses consistency.

Furthermore a number of mandatory impact assessments and strategic advisory councils have been established around 2005, also as a consequence of the European Directives²³ and standards that were established from the early 2000’s. But as these institutions and assessments have prolonged the planning processes to improve quality and to minimize externalities, more recently the tendency has been to bundle them again.

20 <http://www.mobielvlaanderen.be/pdf/mobiliteitsplan/beleidsvoornemens.pdf>

21 The Basic Mobility decree, established in 2002 by the Flemish Government, guarantees a minimum mandatory public transport supply in residential areas. This minimum supply depends on or is proportional to the kind (and often size) of the involved residential area, distinguishing metropolitan areas, urban areas, suburban areas, smaller urban areas and rural areas. Each of these categories of urban development have clear set operational objectives for public transport regarding the distance to a transit hub, the frequency of the public services, etc. The implementation of this right on basis mobility started in 2002 and was expected to be finished in 2007. The public transport company (De Lijn) was appointed to carry out the project (<http://www.mobielvlaanderen.be>).

22 Data on public transport expenses for the regions retrieved from (Belgisch Staatsblad 2014, Service Public de Wallonie 2014, Vlaams Parlement 2013) data on company cars tax advantages retrieved from (De Smet 2014)

23 For instance the Strategic Environmental Assessment Directive (Directive 2001/42/EC), the Environmental Impact Assessment Directive (Directive 2011/92/EU) and several air quality directives (e.g. 2008/50/EC Directive on Ambient Air Quality and Cleaner Air for Europe).

In 2004 for instance the Minaraad was founded; the advising council for the Flemish government concerning environmental and nature associated issues. This council was soon followed by the mandatory Environmental Impact Assessment reports (EIA, *MER, milieu effecten rapportage*) for large projects with potentially major externalities for the environment. In 2006, a mobility council for the Flemish government was established. Followed by the set out of an assessment specifically for mobility impacts, in 2009: the Mobility Impact Assessment (MIA, *MOBER, mobiliteits effecten rapportage*). Also the mobility test (*mobilitoets*) became compulsory, a rather brief report that screens the potential mobility impact for the smaller mobility projects (<http://www.mobielvlaanderen.be/>). Nevertheless, all these new institutions and assessments have further formalised and extended the complexity of up-to-date and innovative space-mobile interventions.

Since the millennium break, the sustainability concept became adopted in prevailing policy documents. At the European level that switch was made as well. Since the negative EC report on urban transport regarding the share in congestion costs (80%) and carbon emissions (14%), and because “urban areas accounted for 60% of Europe’s population, but over 85% of its economic output” (May 2015: 3), the EU wanted to hold a stronger grip on the management of this urban transport in the transition towards a. Seeds for the Sustainable Urban Mobility Plans (SUMPs) were planted. It started with the EC 2009 Action Plan for Urban Transport, after which the SUMPs were further conceptualised, elaborated, and finally communicated in a guidance document in 2013. The guideline clearly stated that it was not the purpose of the SUMP concept to act as a one-size-fits-all solution to urban mobility planning. Instead, the approach strongly encouraged adaptations to the particular conditions of the member state and specific urban area (Wefering, Rupprecht et al. 2013). The guidelines stressed the differences of the SUMPs with the traditional approach to urban more sustainable mobility, whereas the EU used to proclaim the subsidiarity principle in this matter (May 2015) transport planning (see Table 2). Most importantly, it is argued that SUMPs have “a greater emphasis on developing a long term vision, involving citizens and stakeholders throughout the process, specifying objectives, and setting targets related to all aspects of sustainability, and developing effective packages of measures, without undue emphasis on supply-side solutions” (May 2015: 4). However, it seems that when the SUMPs are translated into practice, the supply side is still much more (explicitly) elaborated than the demand side or traffic demand-curbing measures in many cases.

| Traditional Transport Plans | | Sustainable Urban Mobility Plan |
|---|-----------------------------|--|
| Often short-term perspective without a strategic vision | Strategic level / vision | Including a long-term / strategic vision with a time horizon of 20-30 years |
| Usually focus on particular city | Geographic scope | Functional city; cooperation of city with neighbouring authorities essential |
| Limited input from operators and other local partners, not a mandatory characteristic | Level of public involvement | High, citizen and stakeholder involvement an essential characteristic |
| Not a mandatory consideration | Sustainability | Balancing social equity, environmental quality and economic development |
| Low, transport and infrastructure focus | Sector integration | Integration of practices and policies between policy sectors (environment, land-use, social inclusion, etc.) |
| Usually not mandatory to cooperate between authority levels | Institutional cooperation | Integration between authority levels (e.g. district, municipality, agglomeration, region) |
| Often missing or focussing on broad objectives | Monitoring and evaluation | Focus on the achievement of measurable targets and outcomes (=impacts) |
| Historic emphasis on road schemes and infrastructure development | Thematic focus | Decisive shift in favour of measures to encourage public transport, walking and cycling and beyond (quality of public space, land-use, etc.) |
| Not considered | Cost internalisation | Review of transport costs and benefits also across policy sectors |

Table 2 Differences between traditional transport plans and SUMPs.

Source: Rupprecht Consult (2012)

The switch to a sustainability adopting approach was also translated to the regional level, to Flanders (Belgium). In 2009, the decree on mobility policy (*Mobiliteits-decreet*) was established to set the mission, principles, and objectives of mobility plans at all governmental levels: from regional to local, and inter-municipal. The two most important principles in developing such plans were respecting the STOP-principle (*stappers, trappers, openbaar vervoer, particuliere wagen*; pedestrians, cyclists, public transport, private cars), and adopting a participatory approach (Vlaamse Overheid 2009). The five strategic objectives that were incorporated covered the sustainability triple P (People, Planet, Profit): the accessibility of the economic nodes and gateways, selective accessibility for everyone (social concern), traffic safety, liveability, and the environmental quality and nature. The decree also demanded alignment with other associated policy plans and documents (at least with the spatial, environmental and water plans). But in absence of a substantial accordance with the spatial structure plan for Flanders, both the mobility policy council (MORA), and the strategic advice council for spatial planning and heritage (SARO), issued a negative opinion on the draft version of the new Regional Mobility Plan. As such the draft mobility plan from 2014 was not approved by the Flemish government, but was translated into the mobility policy.

In Flanders, a lot of municipal or local mobility plans (LMPs) have been developed since 1998 and have undergone a streamlining as well. The earlier mentioned decree on mobility policy represented an administrative simplification in the relationship between the municipality and the governments. Whereas in the previous covenant policy, separate start and project notes were required with each of the governmental partners, this is now simplified to one agreement in order to increase efficiency in the transition towards a more sustainable mobility. The decree also established several intergovernmental platforms, such as the municipal guidance

committee (GBC, *Gemeengelijke Begeleidingscommissie*)²⁴, and the regional mobility commission²⁵ (RMC, *Regionale Mobiliteitscommissie*). The latter. for coordination between all parties and scale levels and for quality control and monitoring.

These LMPs typically hold sustainability objectives, public involvement, and agreements with all the higher transport and traffic authorities. The mobility plan has to be approved by the higher transport authorities, i.e. the public transport provider (vervoersmaatschappij De Lijn) and the Agency for Roads and Traffic (*Agentschap Wegen en Verkeer, AWW*). Consequently the local mobility plan complies with the higher-level mobility plans. Besides, municipalities can only obtain funding from higher authorities for mobility projects if the broader vision on mobility is explicated in a local mobility plan. Following a study carried out for the state-of-the-art sustainable urban mobility plans, in 2012, 90% of the Flemish municipalities had an approved LMP. That is quite a high percentage compared to other European countries (Rupprecht Consult, 2012). Figure 21 shows that, in 2010, most of the municipalities had either an approved LMP (green colours), were preparing an actualisation of the former one (which still formed the legal basis), or were drawing up a new one (pale colour in the figure). Only a few municipalities did not have an approved LMP (shown in red). This number has further been reduced to seven percent of the municipalities (<http://www.mobielvlaanderen.be/mobiliteitsbeleid>).

Sustainability principles were translated at different governmental levels. Many urban regions and municipalities adopted the SUMP approach in their urban transport planning frameworks, when providing their regional or local mobility plans. In Flanders, there was a strong link between the establishment of such local mobility plans and financial support (from higher authorities for mobility projects), most Flemish municipalities had an approved mobility plan. Because of that, Flanders' mobility governance was considered to be amongst the most well-organised in Europe (May 2015, Rupprecht Consult 2012).

However, this kind of mobility planning has its limiting aspects. First, the SUMPs should not be considered as fixed procedures, nor as standard plans. But the framework becomes highly formalised after being translated to the regional and local level. Although the planning approach left some room for new actors or initiatives, this was not translated into practice. Altering interest and innovative ideas have not found their way into the mobility debate. Most often, the usual suspects, mostly traditional civil society or intermediary organisations, are involved in the planning procedures that feed mobility policy. The mobility planning therefore is threatened by a lock-in regarding the planning procedures and involved actors. While much can be expected from new actors in a context of budget cuts and phasing out the welfare state. Second, local mobility plans can only deal with

24 GBC: a multidisciplinary and cross-policy platform in which the involved partners identify the main challenges and seek solutions for those. They are responsible for the setup, the evaluation and monitoring of the mobility plans and they support the municipalities in their search for a more sustainable mobility. Representatives of the municipality, DMOW, De Lijn, the road authority and the initiating party take part in the GBC.

25 RMC replaced the previous provincial audit committee (PAC, *Provinciale Auditcommissie*)

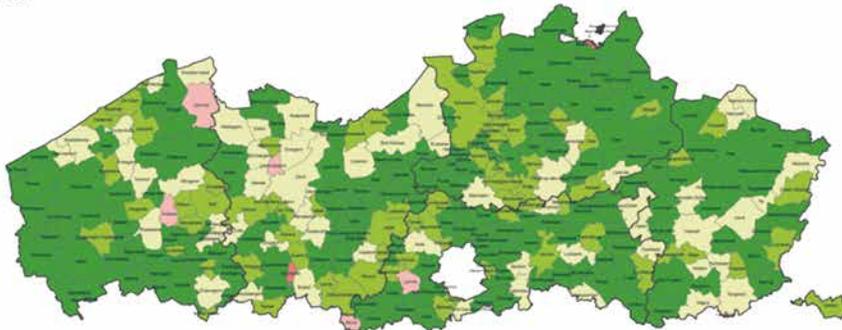
2009



2010



2013



LEGEND

-  Municipalities without a mobility Covenant or LMP
-  Municipalities with an outdated LMP, that needs to be updated (quick scan)
-  Municipalities without a valid local mobility plan, that are preparing a first or second LMP
-  Municipalities with a valid LMP
-  Municipalities with a second generation LMP

Figure 21 Status of Local Mobility Plans in 2010. Source: DMOW, 2013.

mobility problems on the municipal territory. Some municipalities, predominantly in the direct vicinity of cities, often encounter cross-border mobility issues, such as transit traffic problems and the debates on P+R locations. For these issues an inter-municipal or inter-governmental cooperation is more appropriate; the limited workforces cannot only be clustered, but also cross-border mobility issues can be tackled. Those intermediary levels are supported by the mobility policy decree, but, with a few exceptions, have not found their way into practice. Moreover, municipalities together can sometimes create enough critical mass to enforce new public transport services from the public transport provider. But not many of such cooperation or governance partnerships have been successfully and sustainably established hitherto. Third, even within the most well-established transport planning frameworks according to the SUMP principles, “most countries fail to meet all the requirements” (cf. Table 2). Amongst the barriers are: a strong procar and proinfrastructure lobby, the lack of mutual engagement between transport or mobility planning and land use planning, and of an intensive citizen and stakeholder involvement, an inadequate coordination between governmental departments and tiers, and conservative politics (May 2015, Rupprecht Consult 2012).

4.2

More recent efforts in spatial and transport planning

Returning to the evolutions in spatial planning, in 2011, a new initiative was started to update and rethink the current spatial structure plan (RSV). The update would eventually result in the Spatial Policy Plan for Flanders (*Beleidsplan Ruimte Vlaanderen*, BRV). It was the start of a laborious planning trajectory that roughly followed the European administrative course of green papers and white papers. Nevertheless it missed the opportunity to reconnect with the current real world spatial developments. According to some, the co-production of this process happened among the vested (often paid) actors and experts and mainly addressed self-fulfilling themes. Often those papers were accompanied by vague concepts, which do not ease quantitative research support. Accordingly, salvation was sought in qualitative techniques. Hence, monitoring the implementation progress became increasingly difficult.

Even before the BRV has come into being, some already argue that the “BRV process seems to have evolved into a highly introspective endeavour working on a reality that is constructed by a select group of involved actors, and that bypasses spatial and infrastructural developments in daily practice altogether” (Boussauw and Boelens 2015: 1389).

On the first of March 2015, the decree on complex projects²⁶ came into effect. The Flemish government wanted to bring about a new and more dynamic way of planning. To respond to the complex reality that planning processes encounter

²⁶ Complex projects are often large infrastructure projects, but not always; they can also include urban renewal projects.

these days, the decree aimed to streamline the LIP planning processes and focused on building support. The new complex projects approach integrated the former two separate procedures: (1) for changes made to the legal land use (function) as defined by the zonation, reflected in drawing up a spatial implementation plan (RUP, *ruimtelijke uitvoeringsplan*), and (2) to get the necessary permits, namely the building and the environmental permit, that have recently been integrated in one environmental permit or “*omgevingsvergunning*”. By giving more weight to interaction, between a diverse range of stakeholders and interest groups in the planning process, a smoother and more broadly supported implementation of the projects is strived for. In the new complex projects approach, the participatory trajectory is much more elaborated in both formal and informal way, and continues throughout the whole planning process. The rough outline of the complex project process according to the new approach is illustrated in Figure 22. The complex planning approach is characterised by the following phases:

- (0) Exploratory phase (start decision)
- (1) Study phase (decision on preference)
- (2) Development phase (project decision)
- (3) Implementation phase

In the introductory phase, project managers of complex projects explore the most beneficial approach to get their plans implemented; this phase is the prelude to the complex approach, as project managers can still choose to follow the old procedure; The new “complex” procedure is optional. But, because by some, the legal certainty is disputed by the start of the project, or because the additional costs of the new approach are considered too high, many of the current strategic or complex projects still opt for the old (regular) procedure²⁷. The new complex projects procedure is estimated to take minimum 4.5 years in total, which is often longer than the old approach, and thus an additional reason to opt for the old approach.

When complex projects do proceed according to this new complex approach, they follow the rough outline that is sketched in Figure 22. The actual first phase is the study phase, in which the problem definition is elaborated and the impacts and alternatives are compiled into an inventory. The first phase concludes by explicating the project agenda and final problem definition in a start decision note (*Startbesluit*). In the second phase, various options to respond to the formulated problems are evaluated based on multiple criteria elaborated as a study of alternatives (*Alternatieven onderzoeksnota, AON*). This report can be compared to an environmental impact assessment (plan-MER) and is typically associated with a formal consultation and feedback round. After that, a preferred option is decided (*Voorkeursbesluit*). The project increasingly takes shape, now that the preferential option can be elaborated and further designed in the development phase. In that phase, a project assessment (*Project onderzoeksnota, PON*) is carried out analysing the specific impact and effects of the implementation. It can be compared with the project environmental assessment of the old approach (*projectMER*), but it includes more than just the environmental impact (socio-economic, mobility, etc.). On the

²⁷ The preliminary process, often takes 9 months, after which in almost half of the cases the regular procedure is still chosen

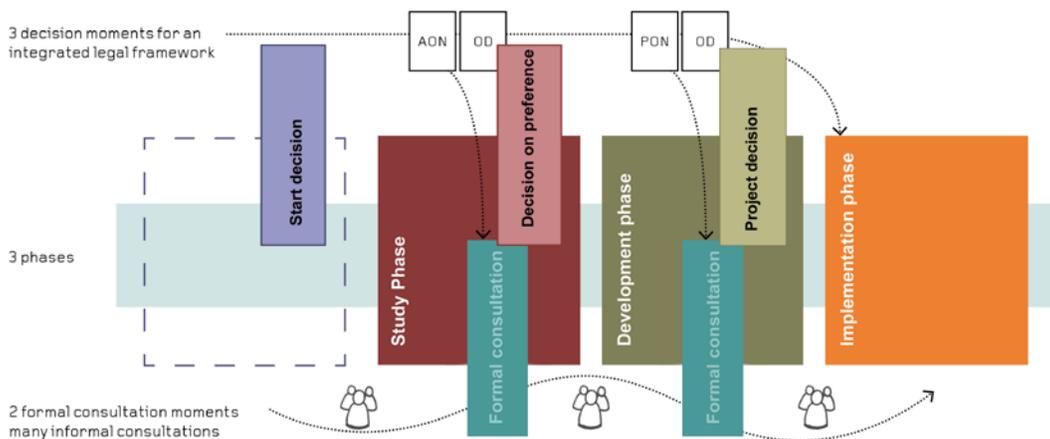


Figure 22 Generic phases of the complex projects planning approach in Flanders.
 Source: based on <https://rsv.ruimtevlaanderen.be>.

one hand, this assessment describes the project and the accompanying measures included in the decision on preference. On the other hand, this note determines what still needs to be investigated: which alternatives should reasonably be examined at the implementation level and how the effects of the project, accompanying measures and reasonable alternatives will be examined and assessed in the light of the project decision to be taken. After a formal consultation and feedback from several advisory councils or public authorities, the project decision is approved and the implementation of the project can start conform that formal decision. At the end of the development phase, the integrated legal framework is set and the environmental permit (*Omgevingsvergunning*) is granted. Since the Decree came into force, 10 projects have been launched, including not only infrastructural, but also urban development projects. Most of these projects are still in the exploratory phase, or have just entered the study phase²⁸.

Although the interactive and informal side of the new complex project procedure is emphasised, many experts remain somewhat sceptical about the complex

28 D. Stevens (Departement Omgeving), personal communication, 16/02/2017 and 26/02/2018.

projects approach, especially at the regional level. The new procedure shows good intentions and is certainly an improvement compared to the previous instruments, especially regarding the organisation of participation (i.e. on a more continuous basis in the new approach). Though, some consider it as a new template, in which complexity is reduced to a delineated process with a clear phasing from a still rather rational-technical perspective. The large complex projects on the regional level often involve political navigation, in which the fragmentation of Flemish projects becomes clear, and party politics exert pressure as well. As such, the criticism is that there is hardly room for the process to run its own course²⁹. However, to be able to evaluate this new strategy, we have to wait until the first complex projects reach a project decision.

Another important switch can be situated at the end of 2015, when the Flemish government decided to replace Basic Mobility by the concept of “Basic Accessibility”, to enhance a more integrated mobility planning approach. This was impeded by the right to basic mobility before; because of the rigid conditions that had to be fulfilled, public transport providers developed independently (rail versus buses and trams, regardless of bicycle or other collective or shared mobility initiatives). But Basic Mobility has not led to a multimodal integration, as the separate modes are not adjusted to one another at all.

The former basic mobility paradigm ensured a minimum level of public transport service supply. It stemmed from a supply-side oriented approach. But the cost-effectiveness of Basic Mobility was poor. Particularly because it did not address the (much more) specific travel demand. Hence, many smaller-scale initiatives arose, to respond to this demand.

- In 2006, the ‘Commuter Fund’ (*Pendelfonds*) was established to make commuting more sustainable. It subsidised specific (collective) commuting initiatives between employer and employees.
- Several municipalities launched a system of taxi cheques to fill in the missing individual transport needs.
- Additional efforts were undertaken to adapt the services to the needs of disabled persons and persons with reduced mobility. Not only the national railway NMBS, but also the provincial mobility centres are targeted for adapted transport services (i. e. *Mobiliteitscentrale Aangepast Vervoer, MAV*).

Those additional initiatives show that the focus on supply-side measures was not sufficient and the already costly Basic Mobility still required extra investments to cover the travel needs. In the past, inter-municipal mobility issues had already raised the need for inter-municipal and intergovernmental cooperation: Regionet Leuven, C-AR by IGEMO; not to mention the earlier MOZO pilot. In addition, De Lijn commissioned several studies to analyse its future operational network, and elaborate several scenarios (study by Deloitte and TML). As such, De Lijn aspired to concentrate their resources on and optimise their services in the core network.

29 F. De Rynck, personal communication, 10/02/2017; T. Wassenberg, personal communication, 24/03/2017.

The Basic Accessibility concept was to be implemented in transport regions (*Vervoerregio's*). Those transport regions would be the new governance constellation or model to integrate all transport modes and allow the top-down decisions to be complemented by decision from the bottom-up (Weyts 2016). Combi-mobility became a keyword in the new approach (i.e. often used in policy circles and papers). It referred to the diverse and situational interventions to respond more adequately to the region-specific travel demand and that aligns different modes (for first and last miles). The shift was initiated towards smart (soft) measures that would optimise the present infrastructural capacity and stimulate a mobility behavioural change. As such, governing mobility could evolve cautiously beyond the plan, as the first attempts had been made towards more adaptive governance (or mobility orgware).

The new paradigm raised hopes to scale back the fragmented urban development, by reducing the benefits for suburban lifestyles as we know them today. Furthermore, the transport regions would monitor and evaluate the cooperation process and progress, and were considered as a permanent body for governing mobility. To experiment with these new forms of cooperation, an “exemption decree” (*decreet regelluw kader, 8 July 2016*) was necessarily established in these pilot zones, since public transport services are officially still the monopoly of De Lijn.

Within the transport regions, a mode-independent, local, mobility management is organised. The transport region is responsible for bottom-up monitoring, control and evaluation of Basic Accessibility. The transport region enjoys a great deal of freedom to fill in the Basic Accessibility for their region from the bottom-up, as a compliment to the top-down defined core network. (translated from Dutch, Weyts 2017: 2)

The first demarcations of the transport regions were stipulated in the passenger transport decree (Ministerie van de Vlaamse gemeenschap 2001). Thirteen transport regions (*vervoersgebieden*) were identified to effectively organise the public transport system. Those zones corresponded with the 13 major cities and their hinterland. However, in the context of Basic Accessibility, those first demarcations were thoroughly revised and adapted so that they could account for existing relevant intergovernmental cooperation and specific regional challenges. Correspondingly, a new zonation was proposed. During the two years, however, some municipalities still changed from one transport region to another. Eventually, the governors of the provinces were addressed to discuss and decide the final constellation in close consultation with the municipalities. The resulting transport region division is represented in .

Initially, three pilots³⁰ for basic accessibility were established as intergovernmental cooperations, called transport regions (*Vervoerregio's*). These transport regions were based on more or less the same organisational structure and shared the same main targets. The organisational structure is centred around the (political) **transport**

30 Later, as a result from the Future Covenant in March 2017, a fourth pilot transport region was established in Antwerp. This will be described in more detail in Chapter 7.

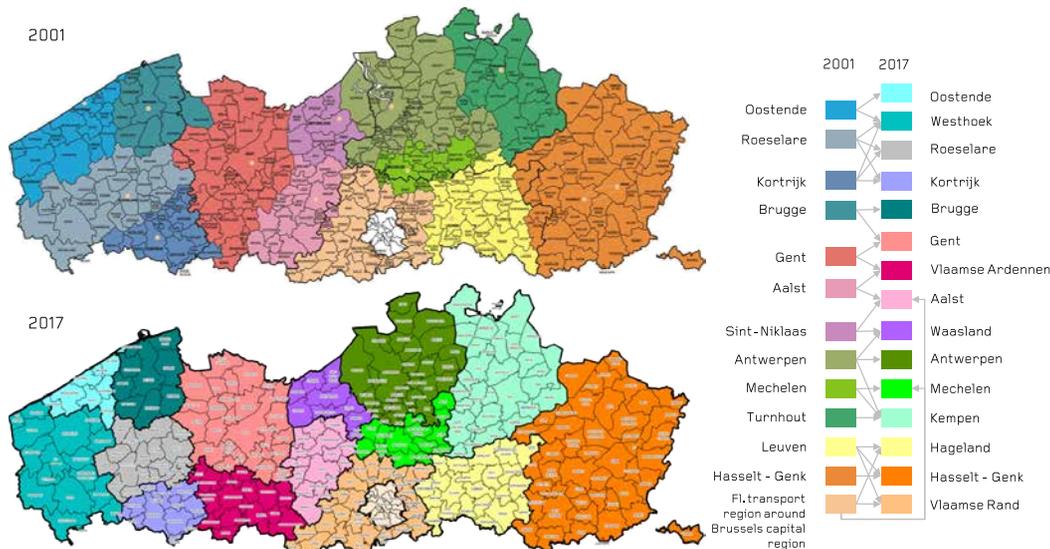


Figure 23 (top) Initial division in transport regions 2001; (Bottom) demarcation of transport regions at the end of 2017. Source: DMOW

region council (*vervoerregioraad*) that takes the final (and political) decisions.

A **work group or administrative transport region council** comprising officials from all municipalities and from the Flemish and provincial administrations discusses, analyses, and elaborates the travel demands in the region. They work towards a content-specific implementation of Basic Accessibility in the region. Based on their work, the transport region council can decide. Furthermore, a **sounding board** is consulted to acquire feedback from civil society actors and citizen movements. Because the above mentioned organisational structure is minimal, it can thus be adjusted and extended with other meetings, panels, etc., if necessary or useful.

After a two-year pilot period (December 2017)³¹, transport regions should have developed a **regional transport plan** (*regionaal vervoersplan*) that is approved by all participating local and regional governments. The ambition was expressed to extend this transport plan to a mobility plan (including all transport modes) (Weyts 2017). This is necessary to further enhance ‘combi-mobility’, which takes into account the first and last miles as well. But apart from the transport region of Antwerp, the elaboration of a fully-fledged regional mobility plan will be for the coming years, as discussing and elaborating a regional transport plan is very time consuming. Recently, the duration of the pilot transport regions has been extended till 31 March 2018. The exemption decree for public transport experiments in the pilots has been stretched till the end of March 2019. In 2018, the preparations were started for the kick-off of the other transport regions in the whole Flemish region, and for the definitive legal framework replacing the decree on passenger transport (*Decreet personenvervoer, 2001*) and the temporarily exemption decree. By 2020, the new transport networks and demand specific services should be operational everywhere.

31 This timing will be prolonged till the end of March 2019

This is consistent with the Flemish government's mission (to conform with EU-Directive) to have a free public transport service market by 2020, even for the core network services. In several pilots, the progress of the transport plans is also affected by the forthcoming elections; the approval of some of the final transport plans are postponed till after the elections of 2018.

The current methodology used to draw up the transport plan differs slightly between the various pilot projects, but is based on the following principles:

- Identifying the supply side (existing public transport lines, services adapted to transport, etc.)
- Mapping the missing links and 'white spots'
- Making an inventory of the attraction poles, transport magnets and transport hubs.
- Developing a core, a supplementary, and a customised transport network
- Looking for overlap between attraction poles, transport magnets and transport nodes to decide and draw the core network.
- Analysing and aligning the core network, the complementary network, and customised transport.
- Awaiting the advice from the transport regional council and adjusting the plan accordingly.
- Approval of the regional transport plan by the transport region council.

Though the focus is not solely on public transport services, change will still be most noticeable in public transport. Where De Lijn had the monopoly on providing public transport in Flanders, this changes in the pilot transport regions. The basic accessibility concept divides the public transport services in 4 main levels, or operational networks: (0) the train network (*treinnet*), (1) the core network (*kernnet*), (2) the supplementary network (*aanvullend net*), and (3) the customised transport (*vervoer op maat*). All of those networks were previously managed on the national (railway NMBS) or regional (Flemish) scale (public transport De Lijn). What changes for the pilot transport regions then? The transport regions will be able to manage the 2nd and 3rd network themselves. But for developing and aligning their scheme with the higher networks, they still depend on the public transport company (De Lijn) and the national railway service (NMBS).

Where does the money come from? Before, the municipalities in the transport region paid De Lijn to operate in those specific service networks (supplementary network and customised transport, like dial-a-bus services and specific shuttles, see and). In case of the transport region pilots, they do not spend that money on De Lijn anymore, but the transport region council decides what and how to organise those networks; how to merge them to each other, and to the higher transport networks. This is consistent with the Flemish government's mission (to conform with EU-Directive) to have a free public transport service market by 2020, even for the core network services.

| Customised transport De Lijn | k€ |
|------------------------------|----------------|
| VAV Operators | 70,242 |
| Coordination VAV | 8,649 |
| VAV Operators | 21,290 |
| Taxi Operators | 868 |
| Total | 101,049 |

Table 3 Exploitation costs of De Lijn for the customised transport. Source: Weyts (2017)

| k€ | Core Network | Supplementary network | Customised transport* | Total |
|---------------------------|---------------|-----------------------|-----------------------|---------------|
| Mechelen | 11,632 | 15,543 | 1,076 | 27,175 |
| Aalst | 11,804 | 5,797 | 1,325 | 17,601 |
| Westhoek | 5,336 | 3,437 | 4,710 | 8,773 |
| Total exploitation | 28,772 | 24,777 | 7,111 | 53,549 |

- Available budget: parameters as is 2015, except for customised transport

- Excluding depreciation costs of rolling stock and PPP maintenance component

- Excluding overhead costs

* Customised transport: including demand - dependent transport (Vraagafhankelijk vervoer, VAV) and taxi transport (organised or commissioned by De Lijn), not including student transport; parameters from 2016.

Table 4 Exploitation costs of De Lijn for the core and supplementary network. Source: Weyts (2017)

Only looking at the total exploitation costs illustrates that De Lijn invested most in the core network, closely followed by the investments in the supplementary network, but leaving those in the customised transport far behind. In contrast, in Mechelen the investment in the supplementary network (2nd layer) is 4 million euros higher than the budget for the core network (1st layer) according to Table 4. In the pilot Westhoek, De Lijn not only invests by far the least, but also the customised transport (4th layer) costs more than the supplementary network (3th layer). This table is proof of the very different existing regional public transport infrastructure and the diverse regional-specific transport demands. The budget that can be used for alternative travel projects³² can be derived from the sum spent in the supplementary network and the customised transport: 16.610 million euros. Nevertheless, these budgets are only of indicative value and do not cover all costs. For instance, many municipalities or organisations coordinate some kind of arranged specific transport themselves and cover the costs for these specific demands. Those costs should thus also be integrated in the transport regions.

32 other than interventions from De Lijn

4.3

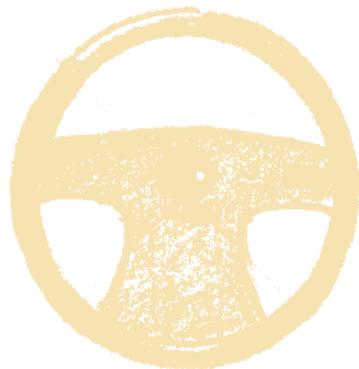
Conclusions

The overview illustrates that the disconnect between spatial planning and mobility or infrastructure planning is deep-rooted, and that actually addressing the mobility orgware, or thus the organisational matter, lags behind. Policy domains and associated plans did not connect to each other. The collaborative process of updating the RSV started in 2011 and has – at the moment of writing this dissertation – only resulted in a Green Paper (2011) and a white paper (end of 2016). An actually approved Spatial Policy Plan for Flanders has not yet seen the light. The same can be said for the regional mobility plan. The updating process had been started around 2010. By the end of 2013, the draft of the regional mobility plan had provisionally been approved by the Flemish government. But for the final version, more integration with the Spatial Policy Plan and the Flemish Climate Policy Plan (*Vlaams Klimaatbeleid*) was necessary according to several participation rounds and advisory councils (*i.a.* MORA and Flemish Parliament).

We could say that an orgware attempt is in its infancy with the Basic Accessibility concept implemented by the transport regions and transport region councils. How do those innovations contribute to the mobility transition and which challenges remain? To answer that question, we dig deeper into the mobility orgware in the next chapters. By conducting case studies we try to gather evidence to answer our central research question: ***What can an orgware agenda add to hard- and software solutions tackling complex mobility issues?***



Regional mobility cooperation



In the previous chapter, we reviewed the mobility planning tradition, and its relation to spatial planning, and we discussed the recent evolutions of the mobility planning tradition in Flanders. We focused on the major developments that are relevant for our orgware agenda. As such, we detected the early roots for the disconnect between spatial planning and mobility in Flanders. But we also saw the governance approaches develop over time, accompanied by their changing planning instruments and decrees. We selected two major threads to shine our light on in this dissertation: the roots for regional mobility cooperation (cf. transport regions) and the implementation and streamlining of large infrastructure processes. We try to unravel how they influenced the case-specific orgware, and where the opportunities lie for improvement.

In this chapter we begin our case study approach with two cases that engaged with setting up a regional cooperation for mobility: the SLUIZO/MOZO case, and the regional cooperation in Mechelen. We deconstruct the actor networks. Following sub questions are answered. How was the actor network of the inter-municipal mobility platform developed or ‘translated’ over time? Where there decisive moments in which the conditions changed the course of the translation process? Which governance strategies were applied?

5.1

Unravelling the SLUIZO/MOZO orgware

In the aftermath of implementing the Masterplan 2020 for Antwerp, discontentment arose concerning the (non-) governance of mobility in the southeast of the Antwerp region. The local mayors urged for specific actions in their region as well, in contrast to the projects and support that city of Antwerp got. A more integrated mobility vision for the region was necessary to counteract the present mobility malaise. Their joint efforts resulted in a mobility study of the region (SLUIZO study), and finally the launch of an inter-governmental mobility platform for the region, i.e. the later MOZO platform. Accordingly, a permanent further consultation, evaluation, and monitoring of the more integrated mobility problems across these municipalities would be guaranteed. That is the SLUIZO/MOZO story in a nutshell. But how did this story, and respective actor networks actually associate? To answer this, we visualise and deconstruct the case-specific actor network.

5.1.1

Problematisation

Figure 24 reveals the actual problematisation phase of the MOZO project. In the southeast of Antwerp, discontentment arose as tangible infrastructure measures in the region lacked, especially compared to the city of Antwerp, that got all the attention. But the actual straw that broke the camel’s back was the increasing transit traffic. It was the trigger to join efforts, or thus the obligatory passage point. Some municipalities in the region indicated the transit traffic as problematic or even dramatic for the accessibility, safety, and liveability in the region. Such inter-municipal issues could not be met within local mobility plans as those were

tied to the municipal territory. As some municipalities took measures that were not approved by neighbouring municipalities, politics were never far away. Mortsel, for instance, governed by a green mayor, took a controversial initiative. The municipality reduced the car capacity in the centre in favour of public transport, and liveability and safety interventions. Therefore, Mortsel was regarded as the black sheep, passing on the transit traffic problems to neighbouring municipalities (e.g. Borsbeek and Edegem). Furthermore, the municipal administrations reported a lack of time and budget to carry out inter-municipal strategic planning studies and processes. Those municipalities were rather small and since they had little primary roads on their territory, the Flemish Agency for Roads and Traffic (AWV) could not intervene; the agency focuses on its own management responsibilities that includes the primary road network. To get the necessary attention for the urgent mobility malaise in the region some municipalities joined forces and addressed their issues to the Flemish government (Arckus 2007). As a result, a study was carried out to analyse the needs of the region and the impact of transit traffic on the local transport network (SLUIZO³³-study).

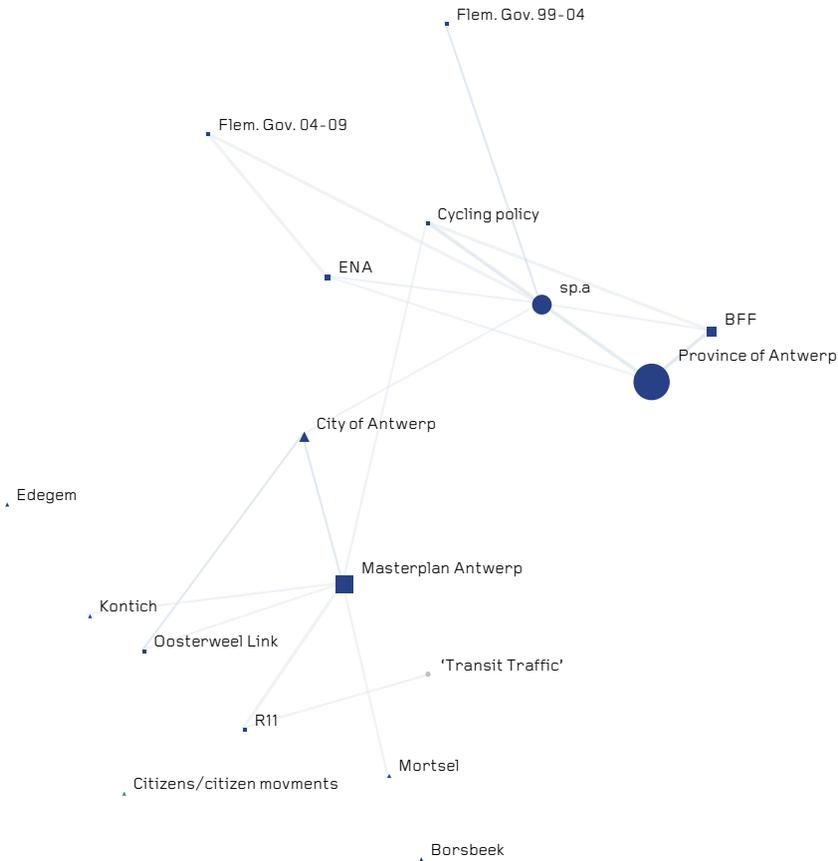


Figure 24 Reconstruction of the SLUIZO actor network diagram before 2007.

33 SLUIZO (SLUIjverkeer ZuidOost Antwerpen): study analysing the transit traffic issues in the south-eastern fringe of Antwerp

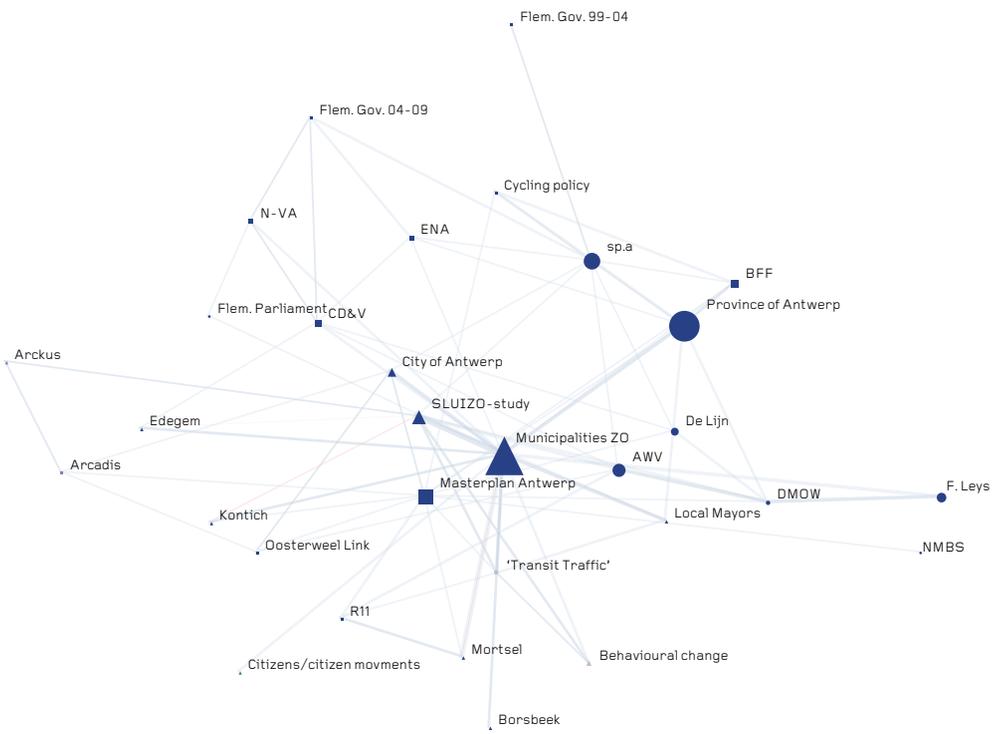


Figure 25 Actor network diagram SLUIZO in 2007, the municipalities' joint efforts.

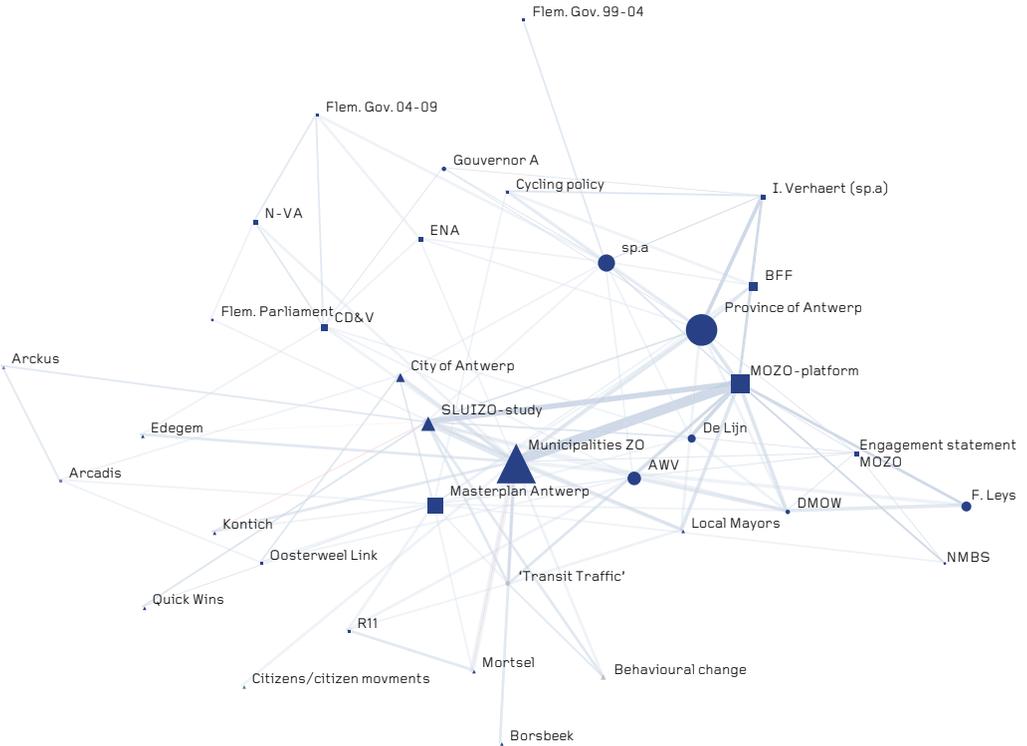


Figure 26 Reconstruction of the SLUIZO/MOZO actor network diagram, the hesitant start of the mobility platform at the end of 2008.

5.1.2

Interessement – discovering the actual problem

The initial incentive for further action arose from the bottom-up. A few dissatisfied mayors in the southern fringe of Antwerp addressed the Flemish government for a solution. They convinced other municipalities to join forces. The actor network around the theme of transit traffic in the southeast of Antwerp grew (see Figure 25). Eventually, the following municipalities engaged in the study process: Aartselaar, Boechout, Borsbeek, Edegem, Hove, Kontich, Mortsel, Ranst, Wijnegem and Wommelgem. Later on also the municipality of Zandhoven got involved in the project.

At first it was unclear whether the solution should be a kind of platform or whether some further research was needed. The minister decided that a study, mapping and analysing the mobility issues in the Antwerp region, would be beneficial to objectify the political mobility debate. Also, the transit traffic was not specified. So, in order to adequately address the problem, a proper analysis of these traffic flows and a clear problem definition was required. Consequently, a study process was launched making an inventory of the issues in the region together with the municipalities and Flemish administrations; the SLUIZO study.

Figure 27 and Figure 28 illustrate the road infrastructure network of the study area. Surprisingly, there is no tangential network connecting or crossing the study case area. Hence, the municipalities were convinced that congestion on the primary road infrastructure (from Antwerp to Brussels and to the East, and vice versa) caused a transit traffic flow through the region and its municipal cores. The perceived problem to solve appeared to be that of transit traffic.



Figure 27 Situation and road infrastructure within the SLUIZO study area. Source: Google Earth, 2015, <https://www.google.be/maps/>.

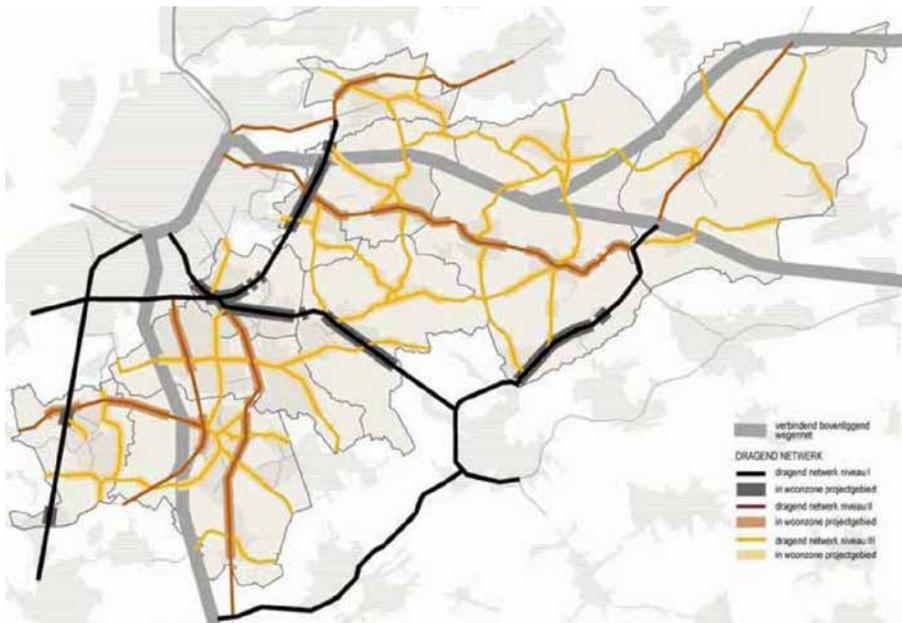


Figure 28 Tangential road network in the SLUIZO region according to level (from primary: I; to local: III) and location with respect to residential area (hatch). Source: Arckus (2007: 105, figure 22).

When the municipalities first came together for the SLUIZO study, they stated that the project could not just result in a new study. They proposed a roundup of the already ‘extensive’ existing literature and research material on mobility for the area³⁴. That perceived body of existing mobility literature appeared to be limited for the specific SLUIZO region and issue of “transit traffic”. As the study budget did not allow much new analysis, the SLUIZO study therefore focused on traffic flows within the area and on the public transport supply. The interactions or travel patterns within the SLUIZO area perceived as transit traffic are shown in Figure 29.

In defining the problem it became apparent that the participating municipalities had different perceptions of transit traffic. Some municipalities took the traffic from neighbouring municipalities into account as transit traffic of their own territory. Putting together all these perceptions, the actual issue to tackle appeared to be the lack of a carrying (tangential) road network for in- and outgoing traffic in the study case area. The congestion on highways and primary roads, and the lack of transit flow on this primary road network was in fact the real cause of the problems in this area. The initial SLUIZO study on transit traffic became the MOZO project, thus incorporating the broader mobility picture of the area, and resulting in the MOZO platform (Arckus 2007).

 34 Note that such studies are in fact secondary sources. They are not conducted for the same purpose, they may carry a lot of information, however this is not direct applicable to the SLUIZO study area. So mainly secondary sources are useful, but they are often not sufficient.

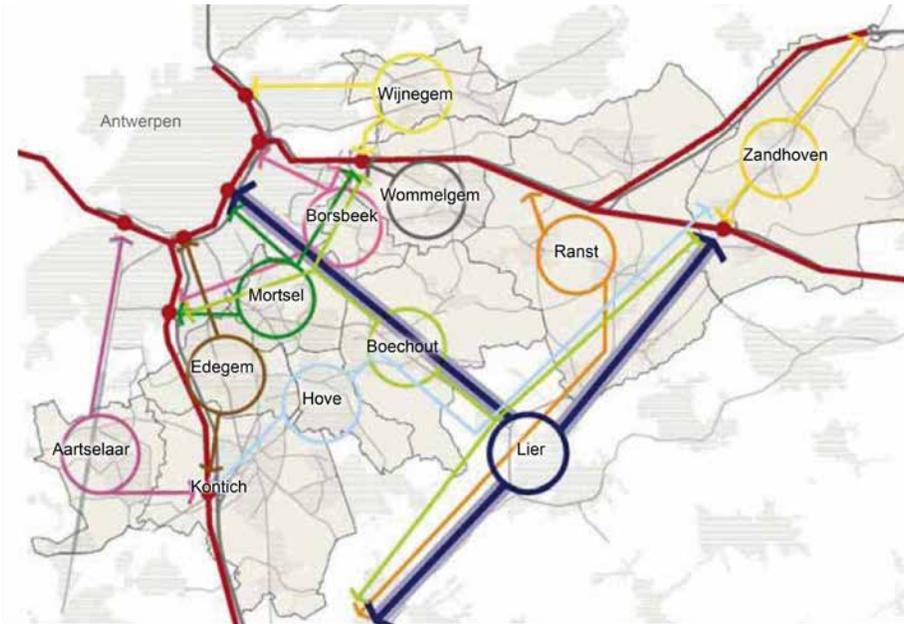


Figure 29 Internal travel patterns from municipalities within the SLUIZO area, often perceived as transit traffic. Source: Arckus (2007: 51, figure 14).

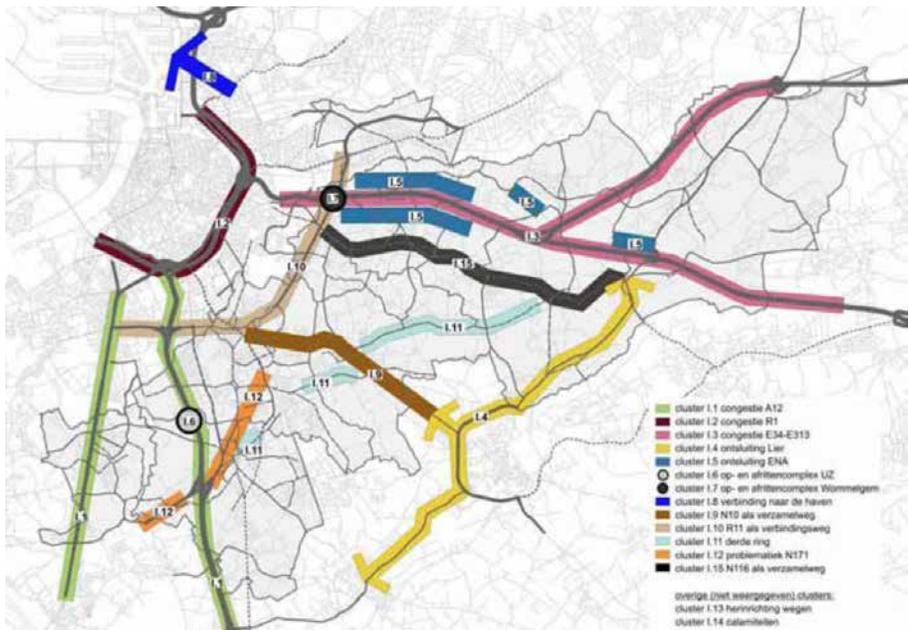


Figure 30 Overview of infrastructural clusters that need adaptation. Source: Arckus (2007: 59, figure 16)

The Arckus consultancy group conducted the SLUIZO study. They followed a consultation structure at three levels. The first level, or the research track, existed of the consultancy leading the project (Arckus). The second comprised the policy preparation and the more technical assistance, and was named the project group (in which people from local and supra-local administrations took part). The third track included the steering group, which was rather political. This level carried out the final choices for implementation. Between the three planning tracks a lot of interaction was organised in the form of workshops and consultations. Moreover it was crucial that the tracks would co-evolve towards a solution or a consensus (Arckus 2007: 17-19).

In the first phase, the mobility literature on the concerned area was analysed by the research group to gain an overview of the available research in the southeast of Antwerp. For the concrete problem definition in the area, the SLUIZO study took into account both bottom-up and top-down approaches. The municipalities listed the local traffic difficulties, while the Flemish administration indicated the bottlenecks on the primary and secondary roads. This resulted in a problem tree, illustrated for the infrastructural part in Figure 31 (Arckus 2007). Merging both perspectives revealed that transit traffic was not the actual cause of the mobility issues. Instead, the congested traffic on the principal road network and the lack of a tangential secondary road network caused the real mobility problems.

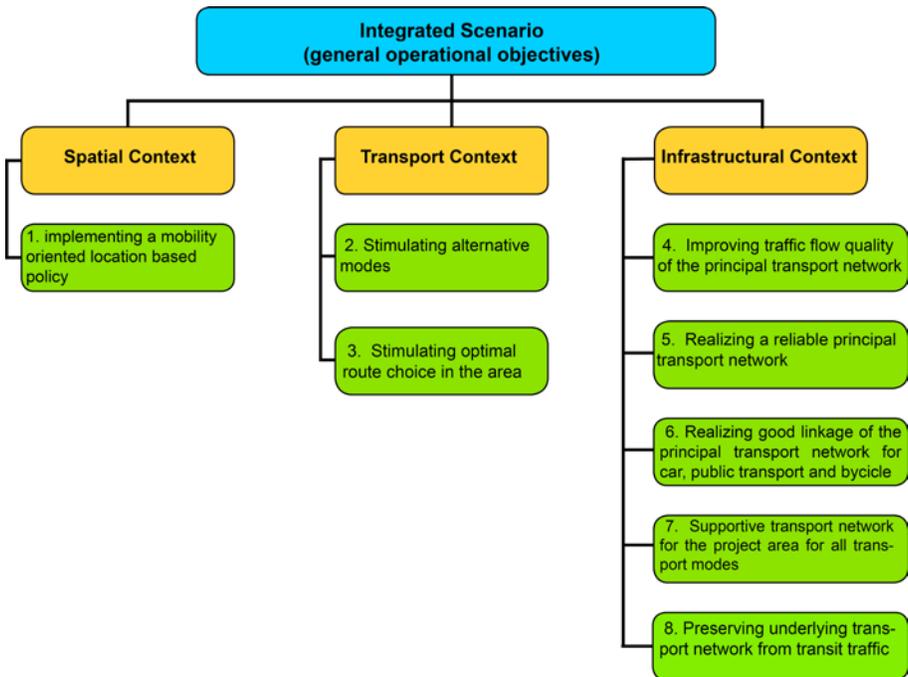


Figure 31 SLUIZO study outcomes of an integrated scenario, suggesting measures per theme and context. Source: translated from Arckus, 2007, p. 7.

In a second phase, the project group came up with a solution tree considering four different future scenarios. They focused on how and where to implement the tangential road network (e.g. where freight traffic would be allowed). Those scenarios held a long-term vision and included operational objectives that were rapidly achievable. Eventually, an integrated scheme was composed, including all the strengths of the basic four scenarios. Afterwards, the operational objectives were translated into tables of measures, clustered according to the relevant policy field. Some of the suggested measures were selected as quick wins, feasible in the short term and at relatively little expense (Arckus 2007: 21-23,94,98,161). Figure 31 shows the three involved policy domains or arenas taken into account for the interventions: the spatial structure (travel market), the transport market, and the infrastructural policy (traffic market). The latter, however, was much more elaborated than the first two, demonstrating a stronger focus on the infrastructural layer and the still dominant engineering approach in mobility planning. In October 2007, the final study was published and the resulting action plans and infrastructural measure catalogues were offered to the municipalities.

5.1.3

Enrolment

After publishing the study results, considerable time elapsed before the actions were implemented and an inter-municipal and intergovernmental platform was established. Actually, the idea of installing a cooperation platform was originated from the top down, from the consultation rounds for the Masterplan 2020³⁵. The Masterplan calculations revealed severe mobility issues on the southern ring road and in the southeast of Antwerp. As such, the set-up of a mobility platform met the needs expressed by the SLUIZO study (by the bottom-up). However, the mobility platform and budget was frequently questioned in the Flemish Parliament. To respond to the growing critiques in parliament, the minister of mobility (K. Van Brempt) asked the provincial mobility deputy (I. Verhaert) to take the lead in the further process. The provincial government was in direct contact with the mayors and they had already collaborated frequently. From this ‘in-between’ position, the province had to neutralise the highly political matter and make linkages to other ongoing mobility or infrastructure projects. The enrolment phase is illustrated in Figure 25.

The platform was operational at the end of 2008. It had its own administration, was financed by the Flemish government, and was initially even mentioned to serve as a pilot for other inter-municipal mobility challenges (Vlaams Parlement 2008). The platform enabled a smooth quality check, follow-up, and monitoring of the interventions suggested by the municipalities. Strategic and bilateral consultations and collaborations between two or more municipalities were facilitated by the platform. The coordination was assigned to civil servants from the Department of Mobility and Public Works (DMOW), namely to F. Leys. Other regions with cross-border mobility issues such as the region around Mechelen and the Noorderkempen showed

35 The “Poort Oost” consultation and support platform guided by the governor of the province of Antwerp, will be mentioned also in the case of the LIP Oosterweel link in Chapter 7.

interest in such an intermediate planning level platform as well. This demonstrated the broader need for such in-between governance.

Unfortunately, major changes were not yet directly visible; due to the quick-win focus adopted in the SLUIZO study. At that moment, and in the context of the new political legislature (2004–2009), the domain of Mobility and Public Works was divided between two ministers, respectively K. Van Brempt and K. Peeters³⁶. Due to a new political balance, cooperation among the two ministers was not going without a hitch. Indeed, the study launched by the minister for mobility (and public transport services) recommended the implementation of infrastructural measures for which she was not in charge. Some municipalities and politicians lost not only their faith in the MOZO platform, but also in the need for this in-between level of collaboration. The operational budget was questioned: “Why would a platform with little or no feasible outcomes receive money, while there is less and less money for the municipalities’ infrastructure?” (translated from: Vlaams Parlement 2008).

Although, the MOZO platform was frequently questioned in Parliament, from its start till around 2010, the minister of Mobility and Public Works³⁷, H. Crevits kept on financing the platform, as she believed in its importance and potential (W.A.M. 2010). An evaluation of the study and cooperation process itself was commissioned by the minister. The assignment was carried out by the consortium Omgeving-Stramien-Vectris in 2010. This consortium also supported the MOZO platform for the more technical analyses necessary to guarantee the progress and quality of interventions (Vlaams Parlement 2010). However, the process and formation of a mobility platform was not supported by the majority of the politicians in the region and died a quiet death.

5.1.4

Demobilisation of allies

Although initially the municipalities themselves were enthusiastic about the cooperation during the first roundtables, in the further course of the process the party politics and election fever took their toll. Expectations of the final study report were high and municipalities were focusing on their own municipal interests (new infrastructures, bus services, etc.). Especially when further (financial) engagements had to be explicated. As a result, so did the engagement from the public actors decrease (the Flemish Agency for Roads and Traffic (AWV), the public transport company De Lijn). A lack of commitment and trust between the various partners (ministries, municipalities, infrastructure agency, public transport company) tore away the platform before it could even show its full potential. As such, the institutionalisation phase of the MOZO project was short-lived. Yet the quest for an inter-municipal or intergovernmental cooperation platform had only just started.

36 When K. Peeters became Prime Minister of the Flemish Government (*minister-president*), his colleague H. Crevits replaced him as Minister of Infrastructure and Public Works.

37 After the elections of 2009, H. Crevits became minister of Mobility and Public Works. As such, the previous split between the two domains (Mobility versus Public Works) was reversed.

5.1.5 BOX

Noorderkempen

What did not happen in the SLUIZO/MOZO case, took place later in the Noorderkempen, a region situated east of Antwerp (see Figure 32). Under supervision of deputy Verhaert, a study process for an inter-municipal mobility vision and intergovernmental cooperation started in the Noorderkempen. The study process was based on the same principles as the MOZO process. Therefore, it can be seen as a successful direct outcome of the MOZO platform.

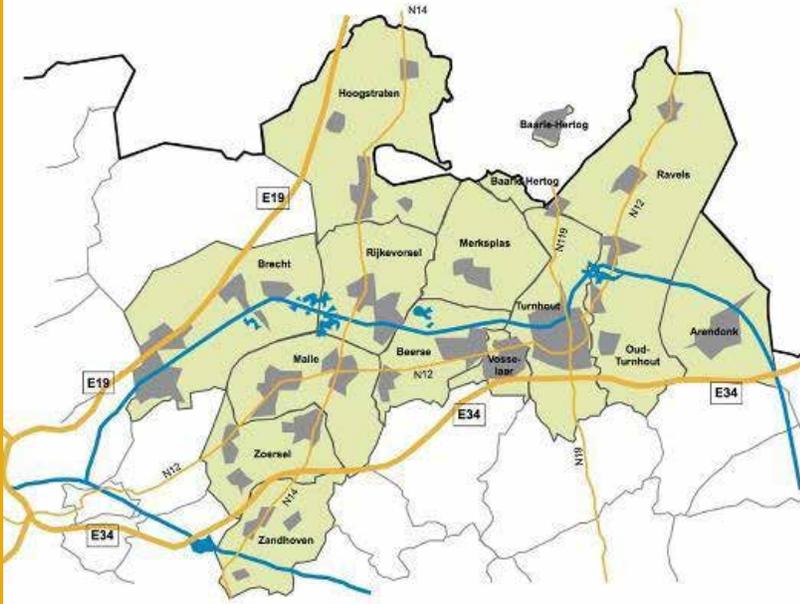


Figure 32 Study area Noorderkempen. Source: Vercruysse, Van den Broeck et al. (2012: 2)

On their own initiative, the 15 municipalities of the Noorderkempen³⁸ gathered together with representatives of the Flemish administrations and ministerial offices: the Agency for Roads and Traffic (AWV), Spatial Development Department (*Departement Ruimte Vlaanderen*³⁹), public transport company (*De Lijn*), national railway (NMBS). Sometimes, in specific workshops also other relevant municipalities or administrations were invited (e.g. the department for Immoveable Heritage, *Onroerend Erfgoed*).

One aim was to develop a shared view on the future mobility for the region in a participatory study process. In 2010, an engagement statement was signed and the process took off. The study was commissioned by the province of Antwerp and carried out by a consortium of consultants: Stramien, Vectris and Tri-visor. In July 2012, the final report was published and the implementation could start.

38 Arendonk, Baarle-Hertog, Beerse, Brecht, Hoogstraten, Lille, Malle, Merksplas, Oud-Turnhout, Ravels, Rijkvorsel, Turnhout, Vosselaar, Zandhoven, Zoersel

39 Nowadays known as Departement Omgeving.

from limited financial resources, also an in-depth knowledge on the nature of the perceived transit traffic problem was lacking. Therefore, the municipalities engaged in a study process (SLUIZO). Later, financial means were enrolled from the top-down, by the establishment of a MOZO mobility platform, that would implement and monitor the actions proposed by the SLUIZO study.

When reflecting on the used governance strategy, we can say that an adaptive governance strategy prevailed: the issue was rather considered complicated; an in-depth knowledge on the nature of the problem lacked, and the actor field was rather stable (mostly vested public actors).

The solution tree and the action programme showed that the planning object, or the conditions, were mainly infrastructure oriented interventions. Furthermore, as the domain of mobility and public works was divided amongst two ministers, this did not enhance the implementation of the action programme. In addition to the action programme, another important SLUIZO objective was establishing an inter-municipal mobility platform. That platform had to obtain a support base among the municipalities for the broader mobility issues. It was a new in-between institution for carrying out research and for making strategic and integrated plans for the area. The MOZO platform could supervise the quality and alignment of the local policy mobility proposals and interventions. The platform was led by a civil servant from MOW. The platform never really took off, as the outcomes and functioning were repeatedly questioned in parliament and the political interference was never far away.

Setting up the MOZO platform finally failed. In fact, the actors, the municipalities in this case, got *interested* with the project because of the wrong reasons. They wanted infrastructural interventions and therefore raised the transit traffic issue as the origin of all traffic misery in the region. The expectations of the final study report were high; the municipalities focused on their own municipal interests (new infrastructures, bus services, etc.), especially afterwards when financial engagements had to be explicated. As soon as the study results concluded that the actual problem was not the transit traffic, but an oversaturated road network and a lack of alternatives, the interest of several municipalities to install a mobility platform dropped. The obligatory passage point, i.e. cooperating to counteract the transit traffic, became irrelevant and teared down the developing MOZO actor network. The deputy was given the lead in setting up the MOZO platform, while the province did not play a central role in the story. So, since the deputy could never enforce a real breakthrough in the MOZO case, the platform gradually evaporated.

Adapting the conditions – Opening up for change?

When looking at the subsystems, in Figure 34, the translation of MOZO did not result in covering the whole CAS of mobility but focused on the transport and traffic market. Subsequently, interventions (or the conditions to change) mainly addressed the traffic market. With regard to the opportunities of a two-tiers framework, we can be short. The initiative was taken by the municipalities that self-organised to get their issues on the policy agenda. But those actors stopped engaging, and the new-born association fell apart. The conditions that were the object of planning (i.e. SLUIZO results proposing a quick-win programme to overcome the oversaturated

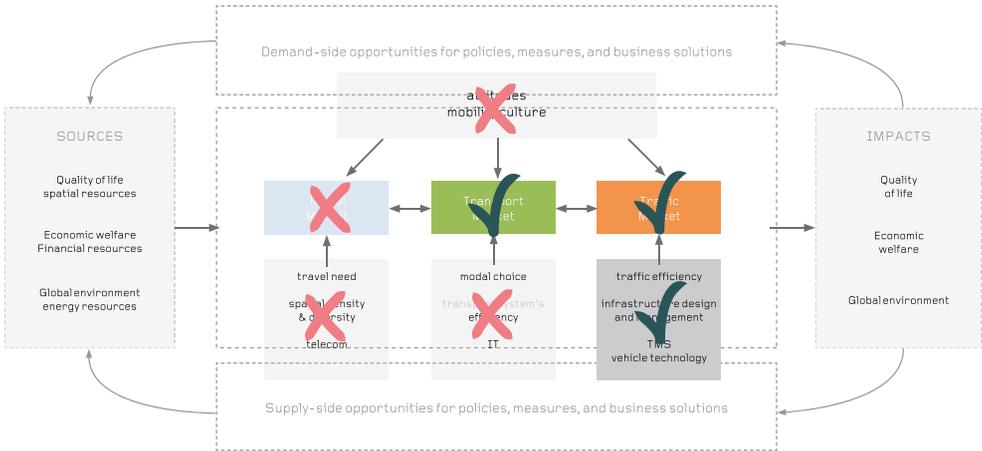


Figure 34 Overview of MOZO mobility system.

road network) did not appeal to the actors. As a result, no windows of opportunity were opened and no structural couplings could be solidified between the subsystems.

5.2

Case regional cooperation Mechelen

5.2.1

Situation

The area around Mechelen, a medium-sized city situated on the axis between Antwerp and Brussels, has a long history of mobility issues. Traffic is frequently congested on the primary and secondary roads. While the major traffic flows are oriented north-south (A12, E19, railway and canal), the local traffic flows in the region are mainly directed east-west, in particular to the N16, the primary road crossing and fragmenting the region. Within the region there is a lack of alternatives for cars. A sufficient tangential transport network that connects the smaller residential areas with each other is absent (Figure 35).

As Figure 35 illustrates, the case study area is divided by major north-south oriented infrastructures. The E19 slices the area of Mechelen in two parts, western and eastern. In the western part, the N16 is the major road connecting the villages of Bornem, Puurs and Sint-Amands, and gives access to the A12. Furthermore the N16 connects those municipalities with the city of Mechelen and the more eastern situated municipalities. In the east, the N15 connects Heist-op-den-Berg with Putte, Bonheiden and Mechelen. But on this road in the direction of Mechelen, structural traffic congestion already starts at Putte. Mechelen itself forms a bottleneck on the axis for a smooth east-west flow. The major traffic problems

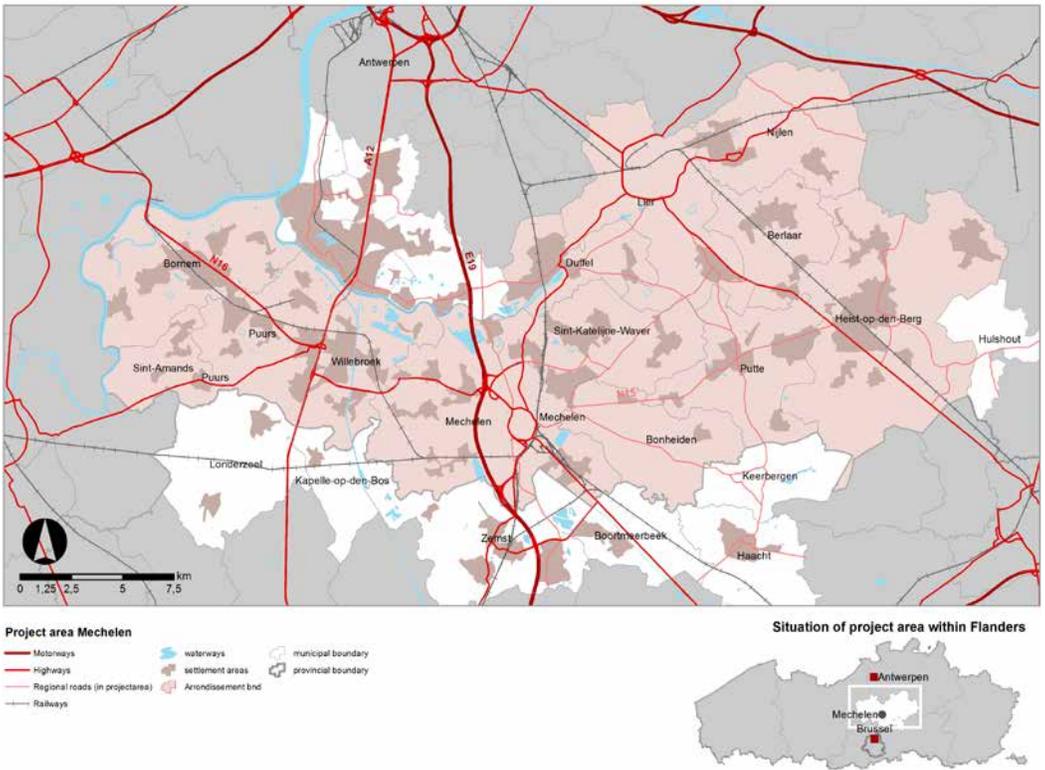


Figure 35 Major infrastructures in the region of Mechelen.

in the area do not (necessarily) stem from the primary road network alone. The structural daily congestion on the Antwerp-Brussels axis sometimes extends to the region of Mechelen, which then becomes manifest on the secondary roads.

To respond adequately to mobility challenges in the region, the local municipalities called for a mobility cooperation across both spatial borders and levels, and policy domains. Although, examples of regional governance have existed for a long time⁴⁰, an integrated mobility cooperation is still in its cradle. In Mechelen, the need to extend this kind of regional approach to other policy fields (e.g. spatial planning, education, housing) is undeniable.

5.2.2

The cooperation 'Accessible Region' (C-AR)

5.2.2.1 Problematisation

As mentioned earlier, during the MOZO pilot, the region surrounding Mechelen showed interest in such inter-municipal and intergovernmental platforms for mobility. Despite the fact that the MOZO case did not live up to expectations,

40 i.a. waste collection and processing cooperations, fire departments and police areas, intercommunal associations, etc.

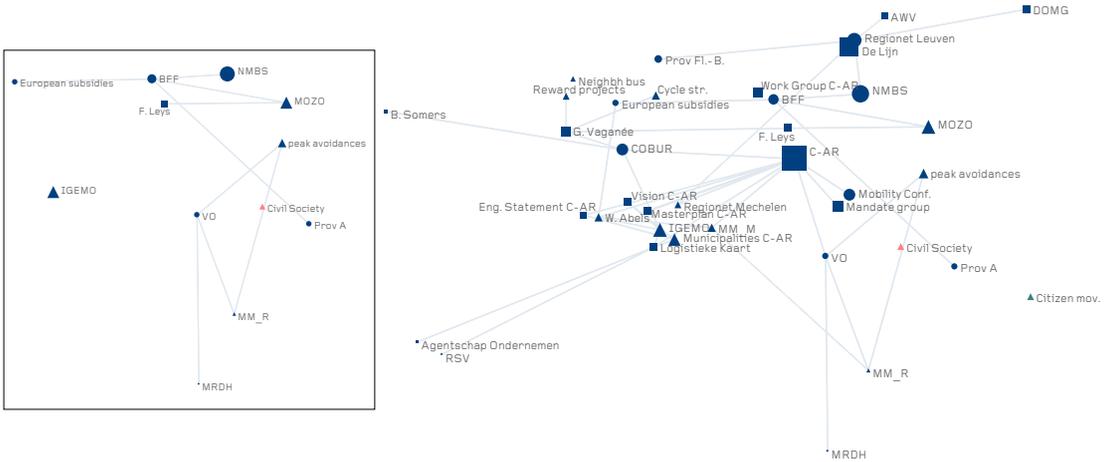


Figure 36 The first actor network developments of the C-AR (left: very beginning).
Source: Van Brussel.

the wish to set up a cooperation for cross-border mobility issues and knowledge exchange only grew stronger in Mechelen. The actual start of the actor networking process, or the problematisation phase, took place at the Conference of Mayors in the arrondissement of Mechelen (*Conferentie van Burgemeesters, COBUR*) at the end of 2014. The need for a more integrated view on mobility was there stressed once more. The intercommunal association IGEMO⁴¹, that chairs and facilitates these COBURs, considered that it was the right time to think of mobility as a lever for setting up an intergovernmental cooperation; the cooperation also entailed other policy domains (education, housing, etc.). The setup of a regional intergovernmental mobility cooperation would enable the region to respond to present and future mobility challenges. To continue the project and round up the problematisation phase, IGEMO had to persuade the actors of the relevance of a mobility cooperation (i.e. the obligatory passage point).

At the COBUR of March 2015, IGEMO presented its first ideas on such cooperation to a broad audience, ranging from local municipalities to higher governments, as well as administrations. To send a stronger message, the director of *De Verkeers-onderneming* (VO, Rotterdam) was invited to the conference as keynote speaker and exponent of a best practice in mobility governance⁴². In March 2016, after negotiations on several later COBURs, the 13 municipalities of the arrondissement of Mechelen, the province of Antwerp, the Flemish administrations (DMOW, AWW, W&Z), and the public transport providers (De Lijn and NMBS) signed an engagement statement for strategic actions in the following 3 years (till the end of 2018). The Cooperation 'Accessible Region' was established and coordinated by IGEMO (C-AR, *Samenwerkingsverband Bereikbare Regio*).

41 IGEMO: Intercommunal association for the development of the region of Mechelen and its surroundings (*Intergemeentelijke vereniging voor de ontwikkeling van het gewest Mechelen en omgeving*).

42 We will not discuss the story of the Verkeersonderneming here in detail, as it is included as a case study in Chapter 6.

5.2.2.2 Interessement

IGEMO elaborated an operational structure (cf. Figure 37) that would enable a straightforward interaction between various policy domains and projects in the region. Various current or future projects in the region were screened to enhance the C-AR. Projects that fitted in the bigger regional mobility cooperation picture were integrated into C-AR framework and activities (see Figure 36). The resulting organisational structure and included projects or basic pillars of the cooperation are detailed in the rest of this section.

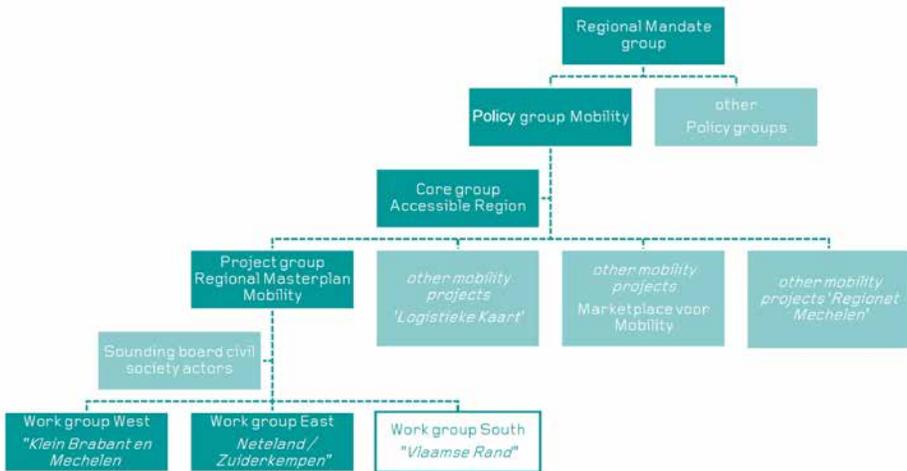


Figure 37 Overview of the organisational structure of the inter-municipal cooperation in the region of Mechelen, coordinated by IGEMO. Source: (based on IGEMO 2016: 6).

Figure 37 represents the organisation structure, that entails the following components:

- **Regional mandate group (*Regionale Mandaatgroep*)**

The mandate group comprises all mayors in the C-AR and takes the administrative decisions. Several parliamentarians inhabiting the region (both in Flemish and Federal Parliament) are invited to attend. With their broader scope they transcend the local interests. Also the deputy for mobility is represented in this group. In addition to public actors, both civil society actors and citizen movements each have one collective vote in the mandate group.

- **Policy groups – mobility policy group (*Beleidsgroepen, Beleidsgroep Mobiliteit*), project and work groups**

These groups focus on the elaboration of the more theme-specific projects, e.g. developing the masterplan in the case of the mobility policy group. They are the forum for consultation, knowledge accumulation and exchange. For the mobility policy group and work groups, people active in mobility can take part. In addition, the administrations (local, provincial and regional) are present, and when desired, external experts or civil society actors can join the group for other insights.

To communicate the project's intentions and to gain support base, the C-AR organises a 'States Regional'. This is similar to a States General, but on a regional scale and for mobility. It is a kind of mobility conference in which decision makers from all governmental levels take part. Civil society actors and citizen movements are also welcome. The main purpose of this forum is to inform the broader audience about the proposed interventions or future vision, as well as to gain feedback from that audience on building a sustainable support base.

Developing an integrated masterplan for the region was the core business of the C-AR. The masterplan would take into account all transport modes. Once established, the C-AR cooperation seemed like the appropriate place to incorporate other governance-related mobility projects that had already been launched earlier. Accordingly, the inter-municipal cooperation was characterised by four pillars:

- **The map for logistics** (*Logistieke kaart*) dealing with the guidance and routes of freight traffic in the region. The project received European funding and was cofinanced by the Enterprise Flanders (*Agentschap Ondernemen*).
- **The marketplace for mobility Mechelen** (*Marktplaats voor mobiliteit Mechelen*) stimulates private partners to invent mobility services to reduce peak hour traffic (peak avoidances, *spitsmijden*).
- **The masterplan for mobility 'Accessible Region'** (*Masterplan Bereikbare Regio*⁴³) elaborates a sustainable mobility masterplan for the whole region.
- **The regional network Mechelen** follows the example of the Regional Network Leuven project (*Regionet Leuven*). The equivalent for Mechelen has been initiated by the city of Mechelen.

5.2.2.3 Enrolment

When the roles and organisational structure were approved, the C-AR became "operational" and the associated projects ran their own course; they were coordinated by IGEMO.

The Masterplan was developed in four phases: (1) the inventory, (2) the analysis, (3) the definition of measures, and (4) the programme of the measures. Phases 1 and 2 resulted in an analysis report, based on which the further two phases would be elaborated and bundled in an implementation programme. The content generation on bottlenecks and priorities took place in the project group and work group discussion events. The process coordination and the actual composition of the masterplan was assigned to IGEMO, under the supervision of an external expert. To save time, each feedback meeting at the end of a phase was considered as the start of the next phase. For phases 3 and 4, two extra work group meetings⁴⁴ were organised with experts, mobility officials and aldermen to generate and discuss the

⁴³ The official title of the report is Regional Masterplan Sustainable Mobility (*Regionaal Masterplan Duurzame Mobiliteit*), but in the interviews more often the name 'Masterplan Accessible Region' (*Masterplan Bereikbare Regio*) was used, to stress the link with the cooperation 'Accessible Region' (*Samenwerkingsverband Bereikbare Regio*) and to avoid confusion with other mobility governance initiatives later on.

⁴⁴ one for the west part of the study area and one for the east.

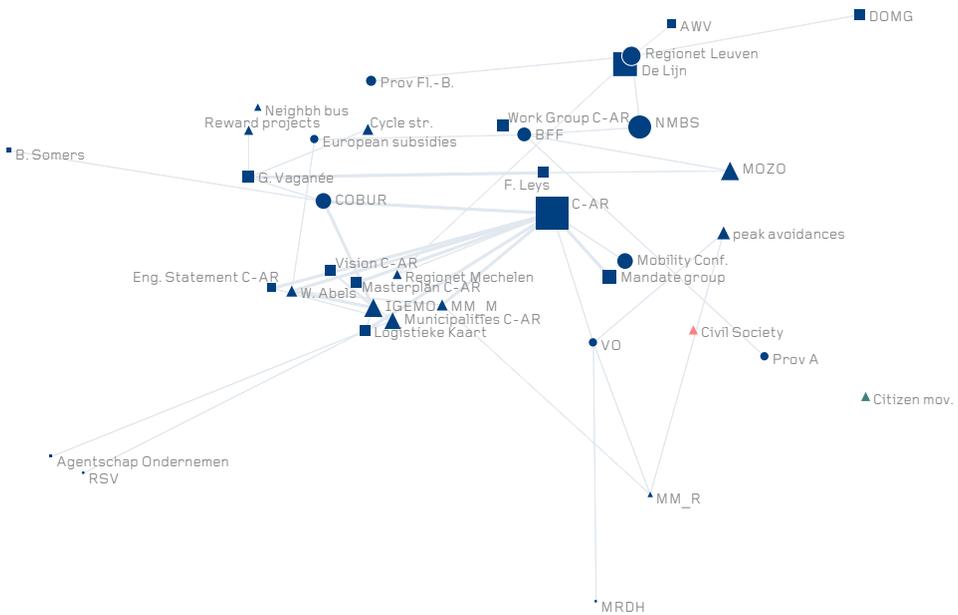


Figure 38 C-AR actor network developments in enrolling their structure (dashed line represents the strived equivalence with other projects).

area’s specific content and solutions. At the end of 2016, the final report mapped the major bottlenecks to target for each sub-region and listed the corresponding financial engagements necessary for the quick-wins. However, this report was never published; thus never officially presenting the priorities and concrete interventions in the region. Since the start of the pilot transport region Mechelen, the C-AR master planning process was put on hold⁴⁵.

In March 2016, thanks to a high attendance, the kick-off meeting of the cooperation Accessible Region (C-AR) resulted in a successful exchange and acquisition of all available information on mobility in the region around Mechelen. In the two following months, the diverse data (often from studies commissioned by local municipalities) were analysed and cross-checked by an external contracted mobility expert, W. Abels (IGEMO).

Although the kick-off provided extensive mobility material, several challenges for the regional analysis occurred. Only the most generic data on traffic flows could be obtained. There was no specific data on transit or local traffic available, nor could the travel motives or travelled kilometres per trip be pinpointed. Questions concerning the ‘where’ and ‘why’ of the traffic had to be left open. However, those questions are of major importance when car travel peak avoidances are among future mobility objectives (i.e. *spitsmijden*).⁴⁶

Not surprisingly, the setup of a systematic traffic monitoring system was brought forward as an important first step; not only for the registration of the vehicles and

45 Pieter Dresselaers (IGEMO), personal communication, 06/03/2018

46 Peak avoidances (i.e. *spitsmijdingen*): reducing the number of vehicles during peak hour by seducing people to engage in tele-work, taking alternative travel modes or avoid peak hours for traveling.

the displacement patterns, but also as a reference base, to monitor and compare the effects of future interventions. Moreover, a lot of freight traffic passes through the region, not necessarily being local traffic. Regarding public transport there is also room for improvement. Intraregional bus connections are poor, and the connections bus-train are almost inexistent. Whereas the north-south axis, passing Mechelen, has a frequent service, the east-west axis lacks frequent connections. The present public transport service is fragmented and does not correspond to the travel demand in the region. When defining interventions to address specific mobility gaps (phase III and IV), the region was divided into 2 subareas, one west of Mechelen and one east. They were spatially separated by the E19 and characterised by their own specific needs. The interventions or main pillars in each of the subareas could be as follows.

In the eastern part of the C-AR area, the focal points were: mobility management and an increasing use of the bicycle (IGEMO 2016: 20):

- a 80% of the area is situated at less than 5 km from a railway station (combi mobility bike/car train)
- b urbanisation is increasing on the Lier-Mechelen axis with both residential areas and industrial sites.
- c successful and relatively fast bus connection Heist-on-den-Berg – Mechelen offers a scope for more comparable services
- d Lier-Leuven corridor (shortest route: 35 km) is multimodal: train (line 16), car (N10) and bicycle and mopeds.

In the western part of the C-AR area the central task was the introduction of combi mobility (IGEMO 2016: 19):

- a Stimulating combimobility of bicycle or car and public transport (train, bus)
- b Accelerated construction of bicycle network
- c Reinforcement of train network and core network of bus (concept of basic accessibility)
- d Water bus connections for the Scheldt, Dijle and Nete
- e Launching a mobility monitor
- f Regional budget for a traffic monitor

At the time of conducting the interviews in November 2016, the concept vision for the regional masterplan was being finalised and the findings from the third and fourth phase were being bundled in an implementation programme. Before the ultimate approval, all stakeholders would get the chance to give feedback on this report.

5.2.2.4 Mobilisation of allies

Although the actors enthusiastically engaged in the C-AR project, interest gradually faded away and was captured by another actor-network process that will be elaborated in the next section. For the financial part, IGEMO expected support from local municipalities combined with a co-financing from the province of Antwerp and the Flemish government. But eventually, only the participating municipalities made a financial engagement. Possibly because the internal development of the

transport region around Mechelen was simultaneously taking shape. Though those financial engagements already had become clear during the first phases, personal engagement and interest from the higher authorities was still present. The C-AR initiative could still take off, and proceed its actor networking. Since the funding was less than expected, some projects in the C-AR were postponed. For instance, setting up a marketplace for mobility was temporarily suspended as were the associated participation and communication. We run through the four project pillars of the C-AR cooperation and we sketch what has come of them, in what they have resulted (so far).

The **Logistics Map** originated separately and earlier than the partnership, but its follow-up and framing fitted within the Cooperation Accessible Region. It was co-financed by the Enterprise Agency and was launched within the framework of the call 'entrepreneurial friendly municipality' (*ondernemingsvriendelijke gemeente*). The project aimed to improve the accessibility of the companies, partners in this project were Febetra, Mobiel 21, Voka, Unizo, and the municipalities in the arrondissement of Mechelen. It had two finalities: (1) optimising accessibility for companies and suppliers, and (2) defining preferred routes so that the quality of life in the neighbourhood and the safety of road users can be guaranteed.

The **Marketplace for Mobility** has not started yet. The regional master plan had been prioritized, because of the impact of the problem definition, mobility vision and programme of measures on opportunities for such a market place. Recently, the project was submitted to several project subsidy calls. The most recent proposal was submitted as an Interreg North Sea region project in the beginning of March 2018 (at the time of writing this dissertation) together with Dutch, German, British, and Danish partners. According to IGEMO, the latter represented a major challenge and a major difference with the mobility market as elaborated by De Verkeersonder-neming in Rotterdam (see section 6.4.1).

The proposal for the **Regional Network Mechelen** (*Regionet*) was rejected by the Spatial Development Department and the project got marginalised somewhat in anticipation of subsidies.

As already mentioned, the final version of the report on the last phases of the **Masterplan Accessible Region** was never published. In this report, the implementation programme, consisting of a list of measures, could have been defined. The proposed interventions would have begun before the end of 2018. Those measures ranged from infrastructural to policy measures that require additional, more in-depth study work.

The Regional Masterplan assessed the present mobility situation and the existing knowledge from the municipal to the Flemish level. Accordingly, an integrated future perspective and shared vision for the C-AR area could be developed. This resulted in presenting readymade handles for mobility policy in the form of a list of interventions and priorities. A concrete coordination between the mobility plans and municipal, provincial and regional bottlenecks became top priority. The masterplan thus provided an integrated picture; it summarised the bottlenecks to draw up a programme of measures, ready to implement on the short term

(2016-2018). By signing the engagement statement, all partners committed themselves for three years of intergovernmental cooperation.

The regional mandate group assumed that the master planning process would be continued by the planning processes within the pilot transport region Mechelen. But that has not been the case so far. Nevertheless, the draft memorandum on basic accessibility of October 2017 mentioned to broaden the scope from drawing up a transport plan (concentrating on public transport) to elaborating of a fully-fledged mobility plan (regarding all modes). But in most transport region pilots (except for Antwerp) developing such a mobility plan is will only start after having approved the transport plan, and thus after the two-years pilot⁴⁷.

The C-AR focuses on an integrated cycle network to form the backbone of the public transport's core network. Not only because the core and supplementary networks do not cover the complete area. But also because the planning and construction of cycle streets is relatively easy (less governmental parties involved, less costly) compared to planning for car or public transport services. Several initiatives had already started. Although the master plan was put on hold, the C-AR got redefined in relation to the transport region and five quick wins were launched under the C-AR umbrella by the end of May 2017:

- Eight municipalities organised a collective purchase of e-bikes 2.0 (e-bikes, Hooverboards, e-steps, etc.).
- “Smart cycling” was listed as a second quick win. Information and best practices in the region regarding cycling, safety, and theft prevention would be gathered in a kind of cycling vade-mecum. This guide would contain, for instance, the type of cycling reward projects in Bonheiden registering the cycling patterns of individuals with bike tracking systems. The municipality of Bonheiden even won the Agoria Smart City Award with its cycle scanning project to stimulate children and employees to go to school or work by bike. To reach behavioural change, opting for the alternatives is linked to game aspects. Competition (i.e. comparison of scores between schools) plays a role up to a certain level, such as indicated in Figure 40 (Agoria 2017). In this light, the municipality of Bonheiden also suggested to transform several local roads and passages (*trage wegen*) into bicycle streets so as to enhance the supra-local functional bicycle route network (*BFF, bovenlokaal functioneel fietsroutenetwerk*). Sint-Katelijne-Waver, Putte, and Mechelen joined the initiative so the conversion could result in a cycling street network. One of these cycling streets even turned out to be the longest in Europe: the 6.6 km long part of the Oude Baan between Putte and Mechelen (HLN. be). Some neighbouring municipalities in the province of Flemish Brabant, Keerbergen, Haacht, Boortmeerbeek and Hever also were enthusiastic about the interventions. They submitted a subsidy application and a request for a public bicycle system (rental services) in the surrounding area and nearby stations. In anticipation of the transport plan and (reduced) future public transport services, the combination bicycle or (shared) e-bike and public transport would provide the region around Mechelen with a complete mobility service.

47 Filip Boelaert (DMOW), personal communication, 07/03/2018; Pieter Dresselaers (IGEMO), personal communication, 06/03/2018

The exact details and partners in the project are yet still to be established. Existing organisations such as Bluebike were considered, but there was not yet enough critical mass to get those actors on board.

- The third quick win was labelled “Traffic data acquisition from traffic monitoring (ANPR)”. The project idea was registered and selected for the call “City of things” of FIT and Imec, but there is still a lot of deliberation about the specific approach to take.
- The establishment of a Yammer-platform around mobility in the region was considered as fourth quick win, but the enthusiasm for this measure was low.
- A fifth quick win overlaps with the transport region pilot (discussed in detail later in this chapter). It elaborates a business case for a new form of public transport, namely “the flexbus”. Though IGEMO elaborates the Flexbus possibilities, there is no systematic communication or project group in direct contact with the transport region. “It all depends on personal network contacts of individuals that engage in both C-AR and the transport region”⁴⁸.



Figure 39 Left: the longest cycle track of Europe between the municipality of Putte and the city of Mechelen, Source: Antoon Verbeek, HLN, 27/05/2016; right: cycling street network. Source: Gemeente Bonheiden.

Cycle scanning project: first figures

- Start date municipal officials 1/10/2016
- Start date school children 17/11/2016



- Total: 556 registered cyclists/pedestrians

Schools:

| | |
|---------------|-----|
| • GEKDO | 56 |
| • GEBO | 201 |
| • SINTEMARIA | 68 |
| • KLIM OP | 105 |
| • DE KNIP OOG | |
| • DCRP | 70 |
| • MART | 21 |

| |
|--|
| ✓ 2.885 trips (this year, on December 6) |
| ✓ 13.236 km |
| ✓ 1.112 liter saved fuel |
| ✓ 2.585 kg CO2 bespaard |
| ✓ 14 km congestion avoided |
| ✓ 254.952 kcal |

Figure 40 Cycling scanning project in Bonheiden first results. Source: Gemeente Bonheiden.

48 Pieter Dresselaers (IGEMO), personal communication, 06/03/2018

5.2.3

Towards a transport region Mechelen

5.2.3.1 Same problematisation, different interessement

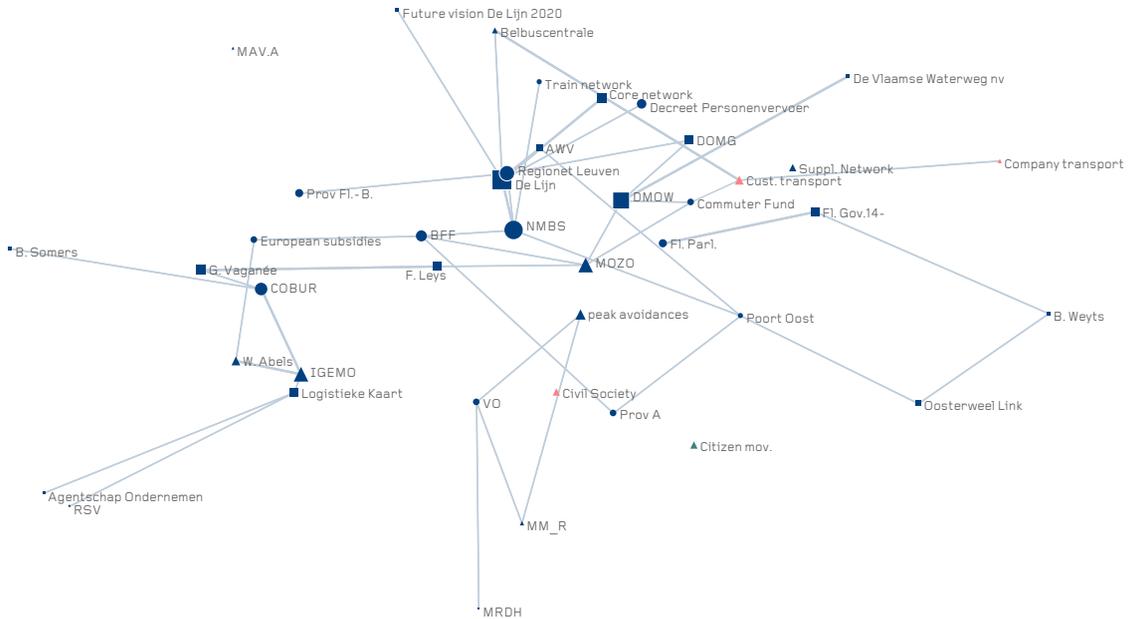


Figure 41 Reconstruction of the problematisation and interessement of the Transport Region Mechelen.

While the Cooperation Accessible Region (C-AR) was taking its first steps (see section 8.2.2), the Ministry of Mobility and Public Works developed the setup of transport regions. Both initiatives developed separately. They were launched by different actors so the arguments were formulated differently. Yet, both initiatives interfere with the same problematisation and obligatory passage point: the need for a regional intergovernmental mobility cooperation to tackle present and future mobility challenges. The C-AR cooperation started earlier, from the bottom-up, while the transport region Mechelen was initiated from the Flemish administrations (top-down). The developing C-AR in Mechelen showed that there was interest and engagement to govern mobility on an intergovernmental level. The cooperation was one reason why Mechelen became selected as a pilot region Basic Accessibility.

The developing C-AR actor network served the transport region well. It formed the basis for the transport region. The C-AR problematisation phase had just been rounded up successfully: an alliance was created and an engagement statement signed, thus officially making the region around Mechelen a pilot. Meanwhile, and based on the same problematisation, the transport region was busy shaping another actor network. By selecting other objectives and interesting projects, actors from the C-AR network (e.g. the municipalities) were seduced to join the transport region

actor network. As the transport regions were top-down led, they benefited from more guaranteed financial means than the C-AR. Actors involved in both initiatives sought to ensure the mobility cooperation and favoured the certainty of the top-down initiative. Though it remains difficult to say exactly where the transport region initiatives start⁴⁹ and those of C-AR end, what is certain is that substantial interest to cooperate was present in the C-AR and many actors got engaged in both initiatives' actor networks.

Which municipalities are engaged in the transport region? Figure 35 displays the arrondissement's border and Figure 23, displays the initial transport areas from 2001 (De Lijn), and the most recent demarcations of the transport region. Because the Cooperation Accessible region had just started, the 13 municipalities of the arrondissement were initially considered for participation in the transport region Mechelen too (at least in the very beginning in 2016). In contrast with the earlier zoning, dating back to 2001, the municipalities north of the river Rupel⁵⁰ are no longer part of the transport region Mechelen. At the end of 2017, a few municipalities switched to other neighbouring regions. In summary, the transport region Mechelen covers 14 municipalities and crosses the provincial boundary between Antwerp and the eastern part of Flemish-Brabant.

In December 2016, a call for tenders was launched to supervise the process and to support the transport regions technically and administratively. In Mechelen, four consortia submitted a tender. One of them was the intercommunal IGEMO, in partnership with BUUR (architects and urbanists), and Mint (mobility and infrastructure planners). IGEMO wanted to develop the mobility cooperation in the region, but their bid was not selected. Another consortium got the assignment for the region: The New Drive (project manager for cleaner mobility solutions), in partnership with Goudappel Coffeng (expert in mobility and (IT)-services for mobility), IMOB (Hasselt University Transportation Research Institute), and APPM (Management consultants)⁵¹. IGEMO regretted and even contested this decision⁵², but reconsidered later under pressure of the local mayors. After all, the region around Mechelen had finally been rising on the policy agenda, and had made it to pilot transport region. Nevertheless, the relation between the intercommunal and the commissioning Flemish administration for Mobility and Public Works (DMOW) remained difficult for a while.

What happened to the C-AR initiative and what was the role of IGEMO in relation to the transport region Mechelen pilot then? While the transport regions were still

49 From the interviews we conducted with IGEMO, the Flemish administration, and a mayor, the outlines of both cooperation initiatives did not become very clear. The interviewees were involved in both cooperations to some extent (whether official or unofficial), and did not make a clear distinction between the two initiatives when talking about governance structure, proposed interventions or examples in the field. Although the interviews were specifically addressed (and titled) to explore the one initiative or the other in detail, and to look for their differences and interrelations afterwards.

50 Aartselaar, Boom, Hemiksem, Niel, Rumst en Schelle switched in the most recent transport region zoning, to the Antwerp transport region.

51 This consortium also got the Aalst transport region project

52 its own autonomous initiative, this time not supported by the mayors and municipalities which it represents

‘under construction’, the cooperation Accessible Region was elaborating the final phases of its regional masterplan. But after a while, the once so engaged municipalities were withdrawing from the C-AR platform and concentrated on the transport region. Yet, the Regional Mandate Group still gathered a few times and its decisions also influenced the transport region Mechelen. Because mostly the same mayors sat around the table. To avoid an unnecessary duplication of effort, both initiatives were urged to align. Indeed, guided by IGEMO, the C-AR had already developed a regional masterplan and implementation programme for most part of the region. The master planning process was put on hold so it could be aligned the decisions of the transport region council. Later, IGEMO negotiated to be included in the transport region council and in the working group to enhance the knowledge exchange with the study team of the transport region Mechelen. In this way, despite their minor role, they are still engaged in regional mobility issues. The C-AR was redefined so that it sustained the work and planning process of the municipalities in the transport region. As the transport region council did not yet decide concrete actions or projects, the role of IGEMO in the story remained small⁵³.

5.2.3.2 Enrolment

Although the transport region Mechelen somewhat absorbed the C-AR cooperation, some organisational characteristics are inherited from the C-AR (see Figure 42 and Figure 43). Section 4.2 already listed the organisation structure of the transport regions in general. But some structures are added to that generic layout.

A politically well-balanced preparatory board of 5 prominent mayors prepares the agenda of the transport region council and prioritises the mobility issues. A Sounding Board, equal to the existing States General, narrows the gap with the municipal councils and gathers support for the proposed interventions. Citizen movements and civil society actors are invited to join this conference as well as to give their feedback on the proposed measures and the agenda of the transport region. Finally, IGEMO became involved in the transport region as well. They have a seat in the council, though as member without a vote, and in the work group that elaborates the mobility plan and interventions. Figure 42 also shows the Flemish administrations (on the right), they are represented in the transport region council by one person. The administrations and higher authorities should speak with one voice, so they do not outnumber the municipalities in the board. To get on the same page, the higher authorities organise a meeting to align their perspectives and objectives for the transport region.

The work conducted in the light of the masterplan Accessible Region has been useful for drawing up the transport region mobility plan. However, the actual policy decisions deviate from the intentions mentioned in the masterplan, especially regarding the implementation and priorities of the public transport in the region. According to F. Leys (DMOW) this will be the major challenge. In municipalities where the public transport network will be reduced, defining priorities for the whole region will be difficult. Often local interests are favoured at the expense of the regional programme.

⁵³ Pieter Dresselaers (IGEMO), personal communication, 06/03/2018; Frank Leys (DMOW), personal communication, 02/03/2018

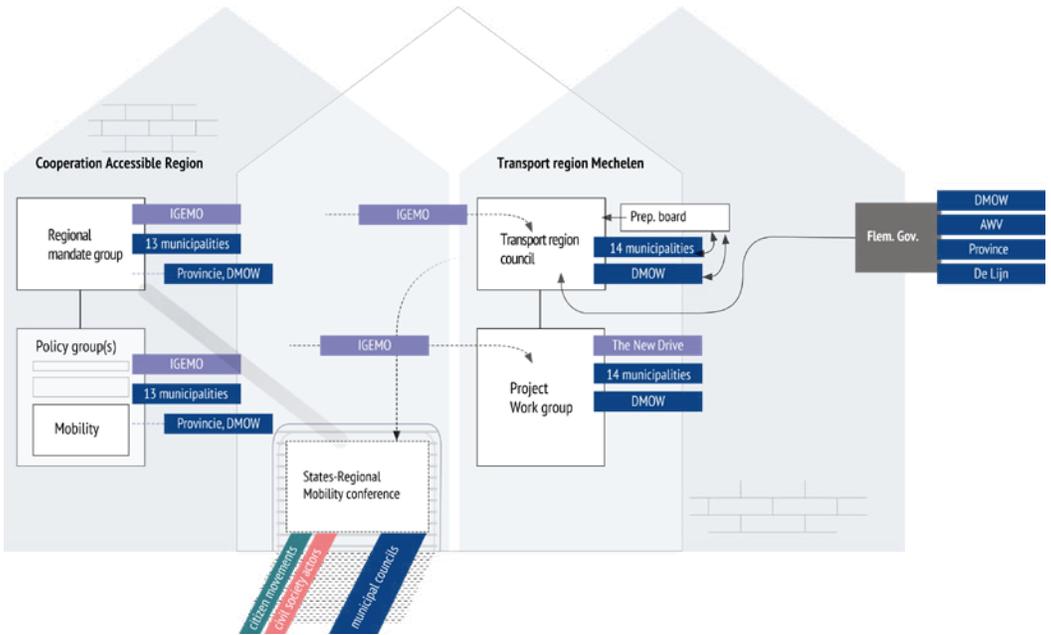


Figure 42 Organisational structures of the C-AR and the transport region and their intertwining illustrated as if it were two households, ending up as one.

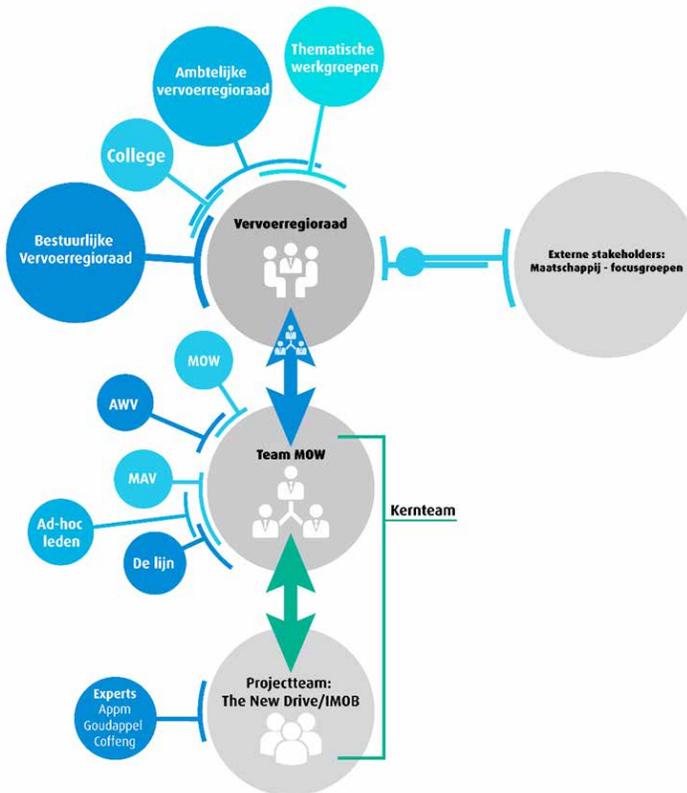


Figure 43 The official organogram of the transport region Mechelen. Source: Weyts (2017, bijlage 2, Figuur 2).

5.2.3.3 Mobilisation of allies

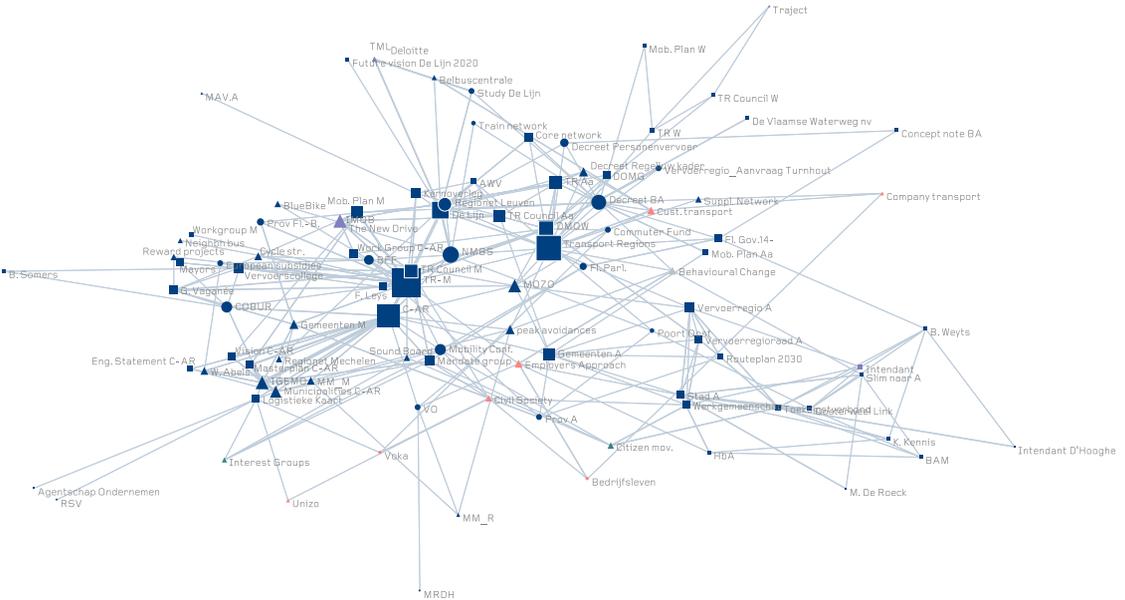


Figure 44 Enrolment and mobilisation of allies of the transport region Mechelen.

The Transport Region Mechelen could already count on a collaborative atmosphere established by the C-AR cooperation and on the knowledge bundled in a regional masterplan. That masterplan could then serve as a starting point for the regional mobility plan. Although there is a large overlap between the two documents, with respect to the view on public transport, there are some important differences in focus between both cooperation processes.

The municipalities indicated the willingness to work towards strengthening and improving cycling-related aspects in the region. These intentions were formulated as quick wins within the C-AR framework (cf. previous section), the cooperation was therewith redefined in relation to the focus of the transport region Mechelen (public transport). Those mostly cycling related quick wins not only include providing cycle infrastructure, i.a. e-bike sharing infrastructure, safe and comfortable shelter, or cycle tracks, but also setting up reward projects for cyclists and raising awareness of the available alternatives for the car. As a second important item on the to-do list, the municipalities stated to counteract the decreasing public transport services of De Lijn in the region. Discussing the future public transport services and possibilities is the core business of the transport region and council. “But counteracting the reduction is wishful thinking within the time frame and budget of the transport region”⁵⁴. It is argued that “the focus of Basic Accessibility seems to be on cutting the budget at this moment.”⁵⁵

54 Frank Leys (DMOW), personal communication, 19/12/2016

55 Pieter Dresselaers (IGEMO), personal communication, 06/03/2018

Regarding the public transport services on the supplementary network and the customised transport, most recent developments at the time of writing this dissertation are the following. De Lijn is still developing its final transport plans for the core and supplementary network. Regarding the customised transport layer, some further steps have been prepared. As the present core and supplementary network do not cover the whole transport region area, refining the fourth layer (customised transport) is necessary, especially outside peak hours and during the weekends. Considered future options integrate the existing and rising initiatives (bus, adapted transport, school transport, shared bikes, shared cars, etc.) and the setup of a coordination centre (to be established) to coordinate everything.

Proposed pilot projects in this respect that are currently being further developed are:

- Neighbourhood buses (*Flexbus*) in Boortmeerbeek and Bonheiden, and one in Bornem
- Shared bicycle systems in Lier and Mechelen

The above-mentioned neighbourhood buses would drive and serve a fixed route in two (Bonheiden and Boortmeerbeek) or three municipalities (Sint-Amands; Bornem and Puurs), and provide a connection to public transport stops (core and supplementary network). The project will be further developed by IGEMO within the C-AR framework. Bonheiden and Boortmeerbeek also explore ways to optimise the capacity of vehicles used for school transport throughout the rest of the day, for other users and transport demands. For the first two proposals, a business plan is being prepared. The explicit intention is to start both projects in 2018 (Weyts 2017).

BOX

Transport region of Rotterdam

In Flanders we recently have been developing transport regions, while transport regions have been established in The Netherlands for two decades now. Therefore, it is interesting to dwell on the origins and the political and administrative context of the Dutch transport regions. In The Netherlands, a substantial amount of national money was traditionally invested in large infrastructure projects. While the provinces also held a major responsibility regarding the mobility or transport planning and implementation. But in the 1990s, the debate rose on setting up transport regions to specifically address the regional needs of cities and their hinterlands. The cities in the Randstad argued that the centralised policy did not address the regional demands in the best way. They aspired to a greater say in mobility policy and interventions. Other cities and regions did not want to lag behind, so 8 transport regions arose: Amsterdam, Rotterdam, Den Haag, Utrecht, Arnhem-Nijmegen, Twente, Limburg and Eindhoven, see Figure 45. Those regions dealt with more than transport issues alone, therefore they were officially called 'city regions' or 'WGR-regions'.⁵⁶



Figure 45 The city regions for region specific intergovernmental cooperation in The Netherlands. Source: Castenmiller, Keur, and Woudenberg (2010: 22, Figure 1).

56 These regions of inter-municipal cooperation were first called city-regions (stadsregio's) or WGR-regions (Wet Gemeenschappelijke Regelingen, law on shared arrangement regions)

These city regions became again the central point of discussion as there were too many governmental layers to pass before decisions were taken. Unlike the provinces, the transport regions did not have a hierarchical character, they were not ruled by a higher central government. Instead, all municipalities in the transport region had an equal say in the transport region council (*regioraad*), and thus, in the decision-making process. The local administrations guaranteed the quality and standards for their municipalities in developing a regional programme.

However, the cooperation did not function well for most transport regions; they could not act decisively. From 2013, the transport regions were abolished again, except for the transport regions in the Randstad: Amsterdam, Rotterdam, and Den Haag. The latter regions served the Randstad well regarding the challenges of economic competitiveness. Later, Rotterdam and Den Haag were aggregated in the metropole region Rotterdam – Den Haag (*metropoolregio Rotterdam Den Haag, MRDH*). The MRDH partnership focused on cooperation in several policy fields: transport, regional economics, education, labour market, housing, green, culture, and sports. In the abolished city regions, the provinces reclaimed the authority over transport policy (Tweede Kamer der Staten-Generaal 2011, 2012). The city regions, thus the compulsory cooperation in the regions, had partly overtaken the central role and authority of the provinces regarding regional policy and dynamics. Therefore, the provinces always denied the usefulness of those city regions. They respected the cooperation, but considered it a competitor, and the mandatory statute of it was deemed unnecessary (Castenmiller, Keur, and Woudenberg 2010).

In contrast, some argue that those city or transport regions functioned better than the provincial authorities. Because they precisely adopted an interactive and cooperative decision-making process, and were not as static and hierarchical as the provinces. Since 2013, the province has engaged more with the still existing regions in order to bundle the forces.

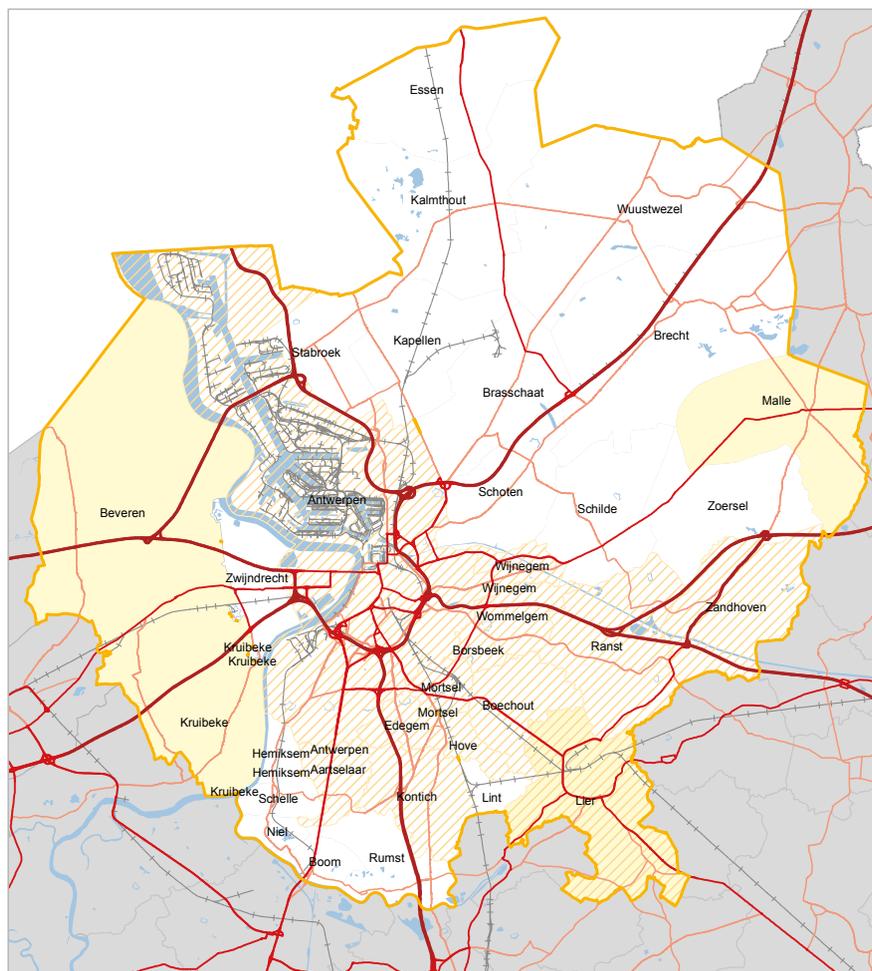
The projects and organisation of the transport regions were financed by national money, as stipulated by the *Brede Doeluitkering Verkeer en Vervoer (BDU VV⁵⁷)*. This annually granted government money was earmarked for the regional infrastructure, traffic safety, and, for example, public transport is paid as a sum to the decentralised governing bodies. Besides those, other financial national contributions are the Beter Benutten programmes, and the Action programme regional public transport (Metropoolregio Rotterdam Den Haag 2014: 13).

In 2015, the MRDH estimated the costs of its traffic programme at 175.1 million euros, the public transport programme at 418.4 million euros, and the programme economic competition position at 5.6 million euros. This adds up to about 600 million euros in total (Metropoolregio Rotterdam Den Haag 2014). The BB-I funds accounted for approximately 150 million in the Rotterdam region.

57 The Ministry of Infrastructure and the Environment distributes the BDU (size: approximately € 1.6 billion per year) to the provinces and remaining city regions for the implementation of local and regional mobility policy. Municipalities do not receive any BDU money themselves, but can apply to their province or city region for a contribution from the BDU pot. However, the BDU is not cost-effective, so local authorities are also expected to partly finance the realisation of mobility projects.

BOX

Transport region Antwerp



Legend

- Motorways
- Highways
- secondary roads (3)
- Railways
- Transport region Antwerp (at the end of 2017)
- Added later
- Mozo_platform
- waterways

0 2.5 5 10 km



Situation of the transport region Antwerp in Flanders



Figure 46 Transport region Antwerp, in relation to former mobility cooperation initiatives or zonations.

We added this box on the transport region of Antwerp, because this transport region emerged in respect to evolutions in another case that we will elaborate later (Case LIP Oosterweel Link). As it is part of the transport region orgware innovation, we wanted to elaborate it here.

Thirty-three municipalities take part in the transport region Antwerp: Aartselaar, Antwerpen, Boechout, Boom, Borsbeek, Brasschaat, Brecht, Edegem, Essen, Hemiksem, Hove, Kalmthout, Kapellen, Kontich, Lint, Mortsel, , Niel, Ranst, Rumst, Schelle, Schilde, Schoten, Stabroek, Wijnegem, Wommelgem, Wuustwezel, Zandhoven, Zoersel, Lier, Malle, Kruibeke and Beveren. The latter four were included later, at the end of 2017 (Vlaams Parlement 2017b). Figure 46 displays the transport region Antwerp and the participation in the MOZO platform. A substantial part of the municipalities (especially in the southeast) had already engaged in MOZO project. Compared to the zonation of 2001 (see Figure 46) some municipalities north, northeast and south of Antwerp were added in the most recent transport region Antwerp. But note that this zonation is not yet the definitive transport region necessarily; the governors got the task to bring together all the municipalities of their province and eventual other relevant municipalities, to evaluate and discuss the preliminary zoning with regard to the region-wide implementation of the transport regions.

The transport region Antwerp officially started when the Flemish government, the city of Antwerp and some prominent citizen movements signed the promising Future Covenant⁵⁸, in June 2017. Because of its priors and long history, governing mobility in the region around Antwerp had its own dynamics⁵⁹. Hence, the pilot transport region Antwerp requires a more case-specific organisation structure to deal with the complex mobility situation, ongoing projects, impact management, and future perspectives (Figure 49). Just like in the other transport regions, the transport region Antwerp has a transport region council, a work group or administrative transport region council (*ambtelijke vervoerregioraad*) in which the elaboration and following up of the work by officials is done, a 'core group' representing the Flemish administrations, and an expert team facilitating and guiding the decision-making and cooperation process. There are however slight differences between the organisational structures from the transport region Mechelen and that of Antwerp. Sometimes only the name is different, e.g. the regional mobility plan for Antwerp is called the Routeplan 2030. More often however, the entities in the organisational structure are more elaborated – equipped to answer more complex issues. Exploring the differences or similarities among the transport regions, might give the impression that there is a standard or 'regular' transport region, which is not the case. The basic building blocks are each time manipulated differently and organised to prepare for region-specific mobility issues.

First, the core group is much more embedded in the political sphere and

58 The Future Covenant is signed by the city of Antwerp, the Flemish government and the citizen movements, and lists the ambitions and terms on which a further collaboration is based regarding mobility in Antwerp.

59 Not only the LIP Oosterweel link, but also the MOZO-platform has left its marks and is now finally picked up in a more integrated governance structure

comprises two interlinked entities. The **work platform** that involves representatives from the Flemish administration’s executive agencies (BAM, AWV, De Lijn, MOW), the national railways (NMBS and Infrabel) and local governments, that should guarantee a smooth implementation. The other entity is the **administrative taskforce**, in which the leading officials of the Flemish administrations engage to monitor the progress made regarding the Future Covenant and the *Routeplan 2030*. The work platform reports to the taskforce (Vlaams Parlement 2017a: 65-84).

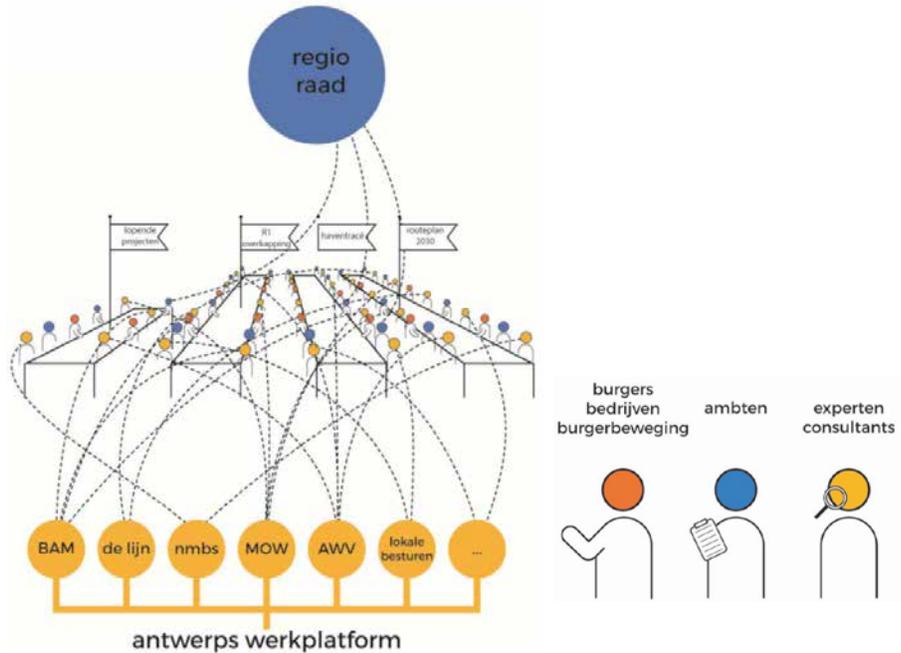


Figure 47 Work Platform (Werkplatform). Source Vlaams Parlement (2017a: 68,77).

Second, instead of a work group in which the administrations and the study team are present, the content is generated by a much broader team, ‘a working community’. As the mobility issues in Antwerp are complex, there is the constant need to get feedback from other ongoing and future projects, from citizen movements and interest groups, from experts, etc. There is the need to exchange knowledge and enable a flexible process and planning. As the ‘super workshops’ of intendant A. D’Hooghe were successful in breaking the deadlock and looking for compromises⁶⁰, this way of working has been continued in the transport region. Under the umbrella of what is called a ‘Working Community’, led by an intendant, the super workshops (cf. LIP Oosterweel Link) are now named working tables (*werkbanken*). These tables engage: experts, people from the core team (administrations), from the citizen movements and from the business sector. Those people gather to discuss, work and communicate on the major themes that

60 For more details about the process lead by the intendant we refer to figure 46.

keep the transport region busy: the capping of the ring road, the ongoing projects (impact management), the Radical Port Route and the Routeplan 2030. Although the first communication and reports on the organogram of the transport region referred to the working community as a team headed by an intendant that guides the processes and communicates to the other tables and with the transport region council, in practice, this role was taken up by the Secretary-General of the Flemish Mobility Department (MOW). Compare for instance Figure 47 and Figure 48, in the first one the intendant is still mentioned, in the second one he disappeared. His role is to lead the working table that deals with the capping of the ring road.

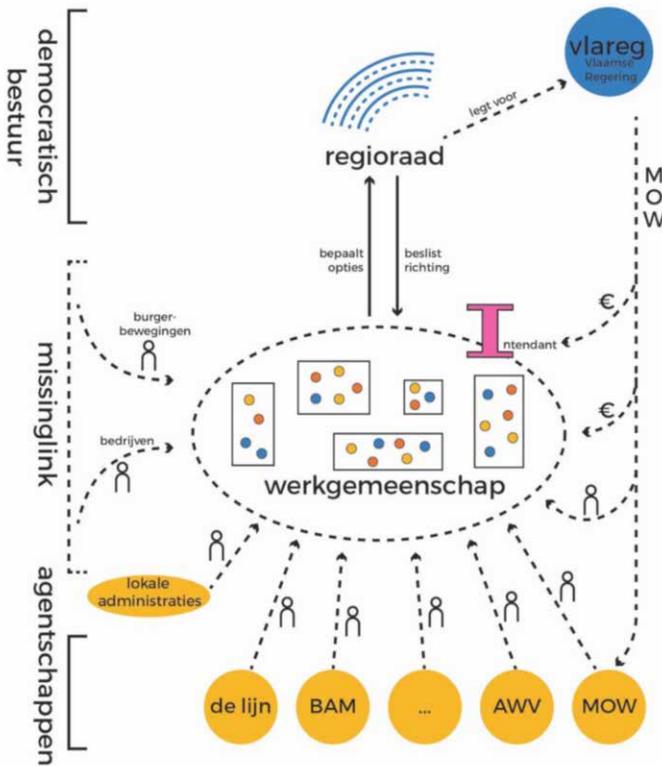


Figure 48 Composition Working Community (Werkgemeenschap) and relations to the Transport Region Council. Source: Vlaams Parlement (2017a: 67).

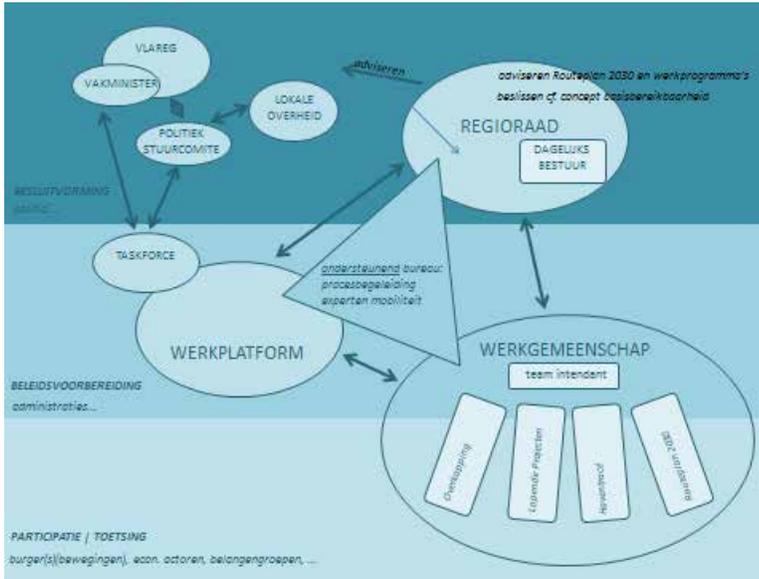


Figure 49 Initial organisation chart of the Transport Region Antwerp. Source: Weyts (2017, annex 2).

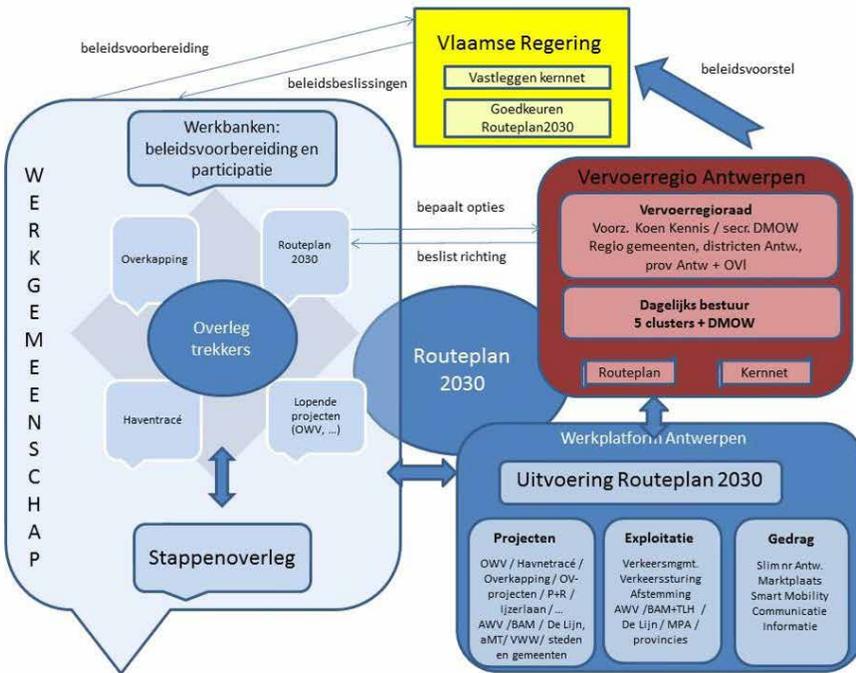


Figure 50 Organisation chart of the transport region Antwerp in 2018. Source: DMOV, 2018.

5.2.4

Results and discussion regional mobility cooperation – towards transport regions

Mobility orgware - solidifying structural couplings

The initiative to start cooperating is an example of a bottom-up collaboration; it was launched by the municipalities in the region around Mechelen. The intercommunal organisation IGEMO took the role of the mediator and started building the actor network for a 'Cooperation Accessible Region' (C-AR). All (public) actors were convinced that a joint effort was necessary to get the accessibility issues of their region on the policy agenda; the obligatory passage point (OPP) was settled. Soon structural couplings arose with other relevant projects and partners, and international best practices (cf. the VO). The C-AR became a mobility umbrella to target mobility issues in the region. Apart from the vested public actors, also business partners and civil society actors were addressed; although only in the initial phases, and to a lesser extent. IGEMO fulfilled a central role in further expanding the actor network. Lessons from the ended MOZO story were learned; financial engagements were explicated. The C-AR association positioned itself in relation to other interesting mobility initiatives (*Regionet Leuven*, the VO Rotterdam). One of the objectives was to launch a marketplace for mobility in Mechelen, to enrol new business partners. But finally those ideas were postponed due to a lack of money. With their masterplan for mobility they tried to shape the conditions for future mobility interventions, though the final document never made it to publication. More or less simultaneously, the basic accessibility concept was launched by the Flemish government. The shift was made from supply side towards demand side oriented policy-making. To implement this demand side oriented approach, governing mobility would be in the hands of newly established transport regions. At the time that IGEMO had just launched its C-AR, the transport region pilots had to be selected. Mechelen became a pilot transport region, because there was this cooperation 'esprit' and the same OPP was settled. The transport region Mechelen did not have to start from scratch, as for the most part, the masterplan accessible region had already been elaborated. Thanks to a sounding board, the civil society and business actors become involved as well, although rather marginal. Also the organisational structures of both initiatives strongly resembled one another. When looking at the actor network diagrams we see that the transport region Mechelen has eventually absorbed the C-AR actor network. The protagonists are the vested public mobility actors.

Adapting the conditions

The C-AR cooperation would not only cover mobility, but also spatial planning, housing and education. The travel, transport and traffic market, were thus part of the C-AR plan. But, at the moment of writing this dissertation, only the mobility part has been elaborated. The initiative also proposed to set up a communication and sensitization approach, and a marketplace for mobility, to curb the travel demand, but by lack of financial means these ideas were postponed. As such, mostly modal choice options were elaborated, and a few infrastructural interventions were considered in the Masterplan Accessible Region. The focus was on smarter alternatives, as the budget for new infrastructural measures was limited.

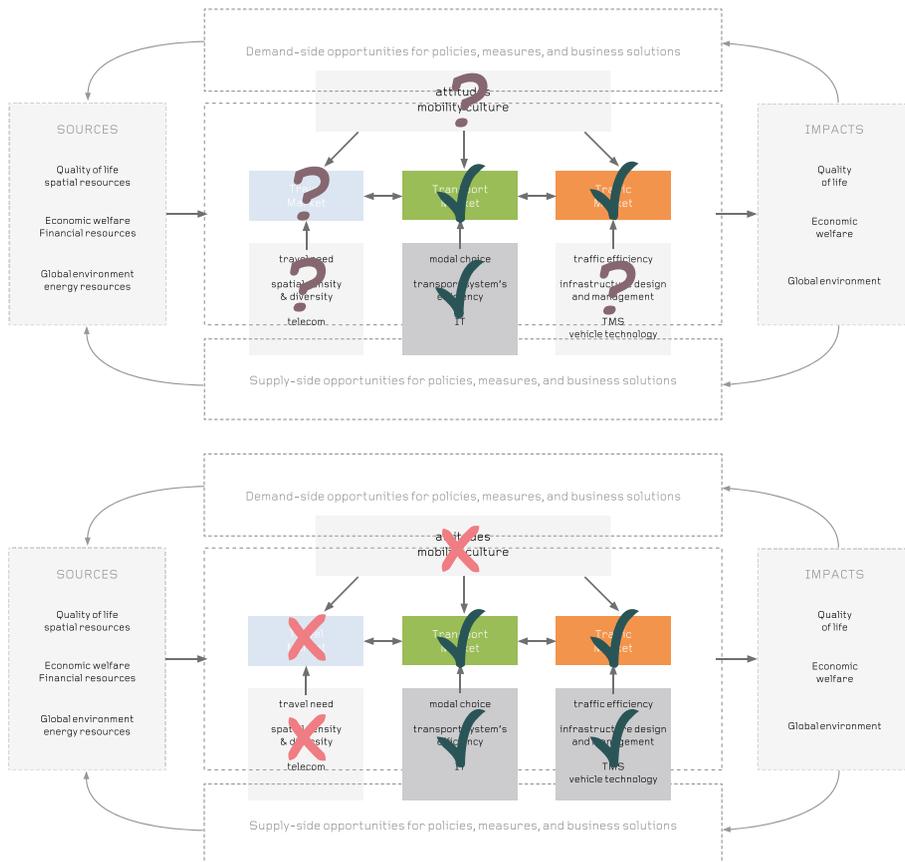


Figure 51 Overview of the orgware of C-AR (top) and the transport region of Mechelen (bottom).

The transport region adopted parts of the Masterplan Accessible Region, and aligned all the transport modes and networks (from core network to customised transport), creating structural couplings. A regional mobility plan screened the specific travel alternatives in the region, for which the necessary financial means were reserved, and the legal framework has been set to try out new kinds of mobility. The first structural couplings had been made during the C-AR process. Consistency was created by dividing the transport market in four different networks, that all have become structurally coupled.

Both regional intergovernmental mobility cooperation agreements in Mechelen did not adopt a fundamentally different orgware approach, as illustrated in Figure 51. In both cases, a rather traditional **adaptive governance approach** is followed, to counter future mobility challenges, resulting in a mobility plan for the region. Different is however, that new transport initiatives will be given more room, as the public transport in the region is reconsidered. The question is whether the transport regions will really enhance the sustainable mobility transition. Only vested actors are brought together, no self-organising initiatives are considered in the process, and associations do not develop much 'beyond the plan'. The link with the travel

market actors is also non-existent yet, as business and civil actors are not included in the transport region council that decides on the mobility programme. In some municipalities, interventions or projects started to enhance a more sustainable mobility behaviour (e.g. cycle reward project for children in Bonheiden). But targeting the mobility behaviour and attitudes is not particularly focused on in the framework of the transport regions.

5.3

Conclusions regional mobility cooperation

Both the SLUIZO/MOZO case and the case for regional mobility cooperation in Mechelen show a rather adaptive governance strategy, that tries to account for a dynamic context, from a stable actor setting.

The actor networks display a lot of blue, meaning that mainly public actors became involved. The need for cooperation was raised from the bottom up in both cases, namely from the municipalities, acting more or less as niches in these cases. The lead in the process was however taken by the department for mobility (Flemish government).

While in the case of SLUIZO/MOZO, the role of the municipalities seemed to be played at the end of the SLUIZO study, this was not the case in the initiatives in the region around Mechelen. There, the municipalities were given a seat in the further decision-making process (cf. regional mandate group and the transport region council). Though the MOZO platform was established to continue the intercommunal and intergovernmental cooperation between the participating municipalities, it did not have much political power and the interest in the platform gradually dropped. Furthermore, the municipalities had not explicated further engagements. The platform did not become anchored in the mobility policy institutions, consequently the SLUIZO/MOZO actor network fell apart.

In the case of Mechelen, some actors stated to have learned from the MOZO experience, for instance by politically anchoring the actor network in the mobility decision-making process, and by expressing engagements and by specifying financial contributions.

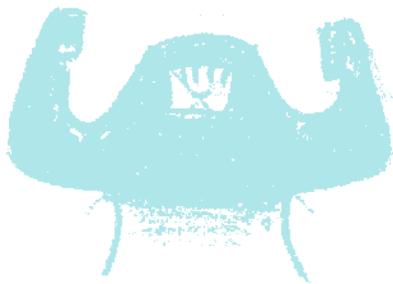
In both cases the proximity of elections interfered with the translation of the actor networks and their institutionalisation process. The MOZO initiative was criticised for not being effective, and party politics were never far away. In the case of Mechelen, the transport region council postpones its decisions (cf. interregional mobility plan) till after the elections. As such, cooperations lose vigour, though at the other hand, that political support or backup proves to be important.

The transport region approach in Antwerp shows some major differences in orgware compared to the other pilot transport regions. This proves that a tailor-made implementation of the “transport region” is possible, but is not always translated into practice (cf. other pilot transport regions). The transport region Antwerp emerged from a combination of a top-down and a bottom-up story resulting in an actual mix of involved actors, which does not apply for any other pilot. The regional cooperation for mobility, is thus crystallising, but whether this approach will pay

off, will depend on the tailor made translations and actor networks. Because, when they do not, they might end up as in the Dutch case, where many of the earlier established transport regions have been abolished later, because they did not have enough added value, except for the transport regions of Amsterdam, Rotterdam and The Hague.



De Verkeers- onderneming Rotterdam



This chapter elaborates on an entrepreneurial public initiative that introduces the market principle in mobility: De Verkeersonderneming (VO) Rotterdam and its real world MaaS application. This case indirectly relates to the former chapter as the VO also deals with regional mobility cooperation, but from a different – out of the box – angle. Their creative character makes the difference; the VO is not just another new intergovernmental cooperation but entails more. This is proved by the many references to the VO and its projects as best practices by interviewees from the former case studies. Therefore, we will shed light on the origins, context and organisation of the VO. The marketplace for mobility is discussed in particular, because that approach has been translated to the Flemish mobility practice as well, for instance, in the city of Antwerp, where the initiatives are clustered under the umbrella of ‘Slim Naar Antwerpen’. That the approach is translated and institutionalised in other mobility policy contexts proves its success. To find some clues for that success, we deconstruct the actor network of the VO and try to find the windows of opportunity that were necessary to establish the new governance approach, and we identify the applied governance strategies. The marketplace for mobility in Antwerp will also be discussed briefly at the end of the chapter.

6.1 Problematisation

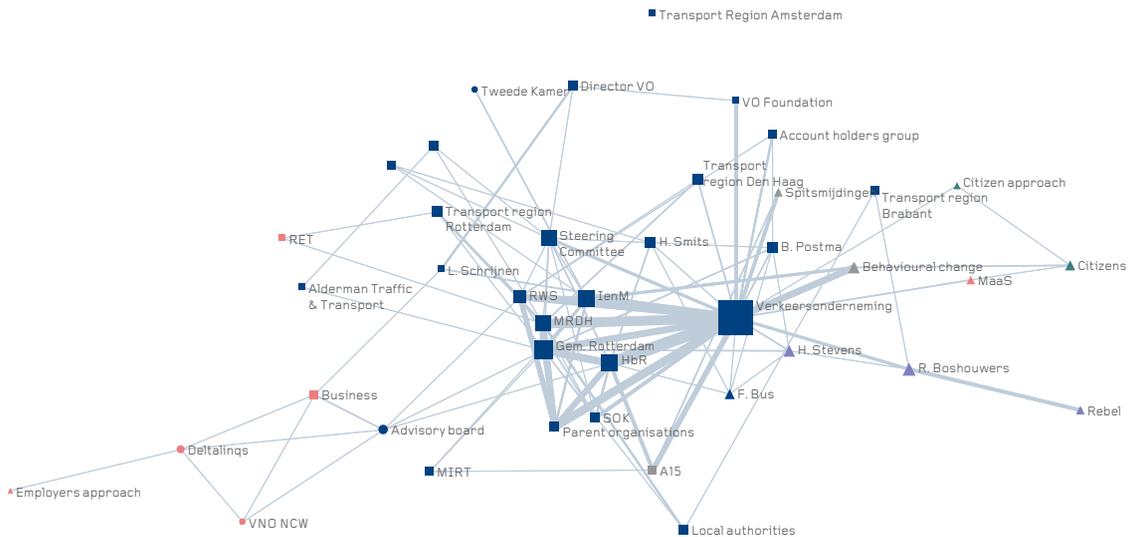


Figure 52 Problematisation – accessibility of City and port of Rotterdam requires cooperation

In 2008, the road authorities wanted to anticipate and counteract the traffic misery that was expected during the planned major road works at the A15 in Rotterdam. The accessibility of the city and the port of Rotterdam had to be guaranteed. During

the five-year works, the capacity shortage on the A15 was expected to be 20%⁶¹. By lack of a decent transport alternative in the area, the present road network would become quite susceptible to congestion during peak hours and in case of calamities, see Figure 53. Even after having upgraded the A15, the (lack of) river crossings would remain the major bottleneck⁶², but would be addressed later (see Figure 54).



Figure 53 Road network and access to the port. Source: PlanMER NWO, <https://www.cob.nl>.



Figure 54 Options for extra river crossing west of the city of Rotterdam, the Blankenburg option (route Krabbeplass West – in yellow) was retained. Source: <http://vervoersplanoloog.blogspot.com>.

61 It was stipulated that the contractor should guarantee a capacity of 90% of the original capacity of the A15. At the same time, the traffic prognosis expected an increase of 10%. Consequently, the total capacity shortage for the coming five years of road works was estimated at 20%.

62 In the meantime, the planning process and intensive participation trajectory (together with 100 stakeholders and citizens) of the LIP *Blankenburgverbinding*, as a most wanted extra western river crossing, started somewhere in 2008. In the beginning of 2016 the *Tracébesluit* (cf. *planMER* or EIA) was finalised. The construction of the project is planned for the second half of 2018.

Within the existing structure of authorities, adequately responding to this substantial capacity shortage appeared impossible. This forced the authorities from all governmental levels to think about cooperating in a new way (i.e. the obligatory passage point). As such, the actor network translation started: enter the problematisation phase (cf. Figure 52). The specific purpose of the cooperation was addressing and compensating the road capacity shortage, by elaborating a programme for sustainable, long-term peak avoidances (*spitsmijdingen*). But where and how to start? The Port of Rotterdam had already strived for such a cooperation, or even an autonomous transport and traffic authority in the region, for a long time. With the upcoming road works, they thought the time right to finally create such transport and traffic authority.

Even Rijkswaterstaat (RWS)⁶³, always keen to solve the road problems alone, reconsidered. Before, Rijkswaterstaat had made efforts in transport management and travel demand reduction. Unfortunately, connecting to the employers to obtain a behaviour change seemed more difficult than expected. The eagerness to solve the things on their own also applied to the other stakeholders, especially for the municipality of Rotterdam. The strong willingness of the port authority had not sufficed to establish such kind of cooperation in the past. However, at that time, there was an important political momentum as well. The director of the Port of Rotterdam, Hans Smits, was a prominent member of the same political party as the former Minister of Infrastructure and Public works, Camiel Eurlings. The very start of the cooperation began at one of their political encounters; the breakthrough had been forced in the political backrooms.

6.2

Interessement

De Verkeersonderneming started with 4 parent organisations (*moederorganisaties*) that joined in a partnership: Rijkswaterstaat, the MRDH, the municipality of Rotterdam and the Port of Rotterdam. Those four public actors remain central in the actor network diagram, but are complemented in the centre by their new cooperation: the VO (cf. Figure 52). Why did those four public organisations become *interested* in the actor network? The influence areas of those authorities largely overlap. So, when addressing accessibility in the region of Rotterdam, those four authorities become naturally involved. After all, Rijkswaterstaat is the road and water authority. The Port of Rotterdam guards the claims of the port and its logistics in the region and on the port territory. The municipality of Rotterdam and the city region of Rotterdam largely overlap and are responsible for the local roads and quality of life issues. Accordingly, they all enter the accessibility issue for Rotterdam. Consequently in 2008, Rijkswaterstaat, the former city region of Rotterdam (later “transport region” of Rotterdam), the municipality of Rotterdam,

63 Rijkswaterstaat is part of the Dutch Ministry of Infrastructure and the Environment and responsible for the design, construction, management and maintenance of the main infrastructure facilities in The Netherlands.

and the Port of Rotterdam joined as partners in De Verkeersonderneming (VO, which literally translates as ‘traffic company’ or ‘traffic enterprise’). Interestingly, in 2008 when the works started, one of the initiators of the VO organised an excursion to Antwerp; the VO was inspired by the impact management of the BAM⁶⁴ regarding the large infrastructure works of the Masterplan Antwerp and the Oosterweel Link infrastructure project (see Chapter 7). Especially the efforts regarding the temporary viaducts in the city during the major works at the Leien had not gone unnoticed. As such, the BAM and the Oosterweel Link story became, albeit marginally, enclosed in the actor network of De Verkeersonderneming. Almost ten years later, it would be the other way around: people from the city of Antwerp and the BAM would visit De Verkeersonderneming, to see how they successfully established a marketplace for mobility and how they implemented the associated smart measures to keep their region accessible.

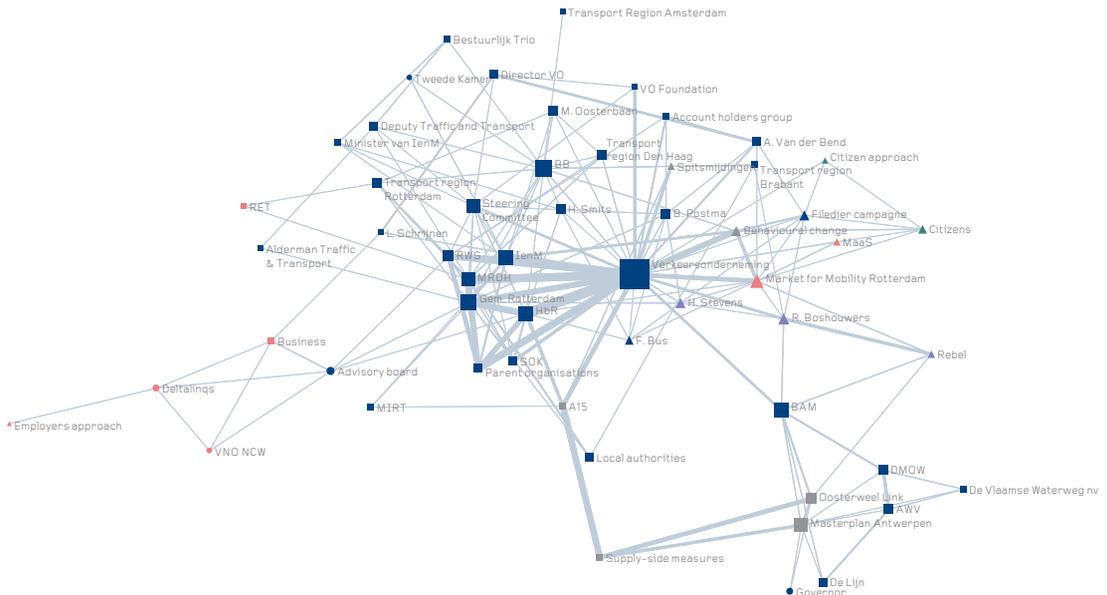


Figure 55 Interessement – De Verkeersonderneming becomes encapsulated in a dense network

6.3

Enrolment: actors and organisation

Initially, the cooperation was considered a public-private partnership, with a strong business link, thus including business partners and employers’ organisations like VNO-NCW⁶⁵ and Deltalinqs. But that relation gradually disappeared and the VO became a public actor on paper. However, if you would ask different people what

64 BAM: *Beheermaatschappij Antwerpen Mobiel*, project management company of the Oosterweel Link project

65 VNO-NCW: *Verbond van Nederlandse Ondernemingen (VNO) en het Nederlands Christelijk Werkgeversverbond (NCW)*

kind of organisation the VO is, the answer would be more ambiguous. Business actors consider the VO as a fellow business partner, whereas public actors look at it as an extra public party. In fact, the VO belongs somewhere in between the public and the private sphere. The principle was that the paying partners had a say in the programme. Accordingly, the link with business actors eventually disappeared and they were not included in the Steering Committee anymore, even not without vote. At the time that the foundation came into existence, it was stated quite clearly that it is the party who pays, who determines. (R. Boshouwers)

In the cooperation agreement, first signed in 2008, the purpose of the partnership was clarified, the parent organisations and their roles were specified, and the financial engagement and exchange of personnel was set out. The cooperation agreement was updated a few times to accommodate to the changing needs and function of De Verkeersonderneming. In the agreement the governance structure was defined, see Figure 56 and Table 5 for an overview. This structure included a steering committee, an account holders group, a director managing the VO Foundation, and the VO programme organisation itself, including programme managers hired by the VO. When the more creative tasks that accompanied some of the projects were carried out by the VO programme organisation, the projects were delegated back to the parent organisations for implementation, where they were coordinated by project leaders from the parent organisations.

After a few years of partnership, it became apparent that a separate management entity was necessary. The VO established a foundation to enhance the pace and the effectiveness of the partnership. The foundation served one specific public purpose: reducing the travel need and realising peak avoidances to guarantee the accessibility of the Rotterdam region. In the first phase of the VO, the accessibility

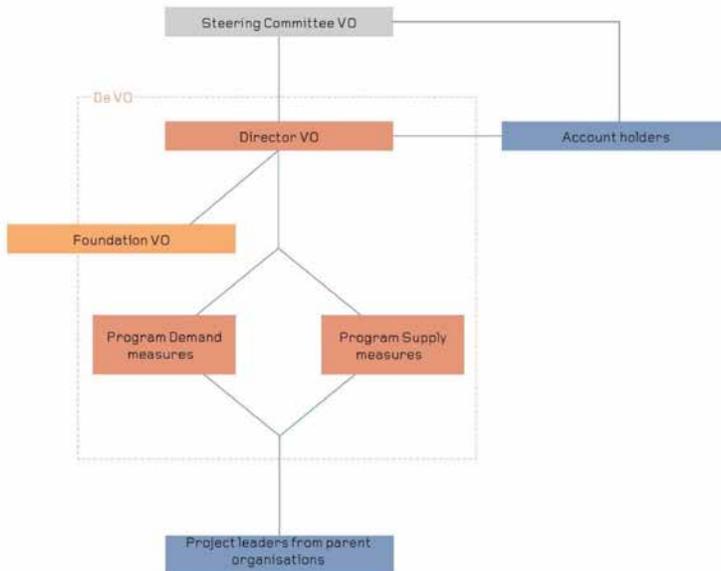


Figure 56 Organogram of the structure of De Verkeersonderneming (based on SOK)

of the port region was addressed, as the road works on the A15 would cause severe congestion. Consequently, the port authority contributed considerably, as their stakes were high in the first phase of the partnership, but their contribution did not decrease afterwards, as the port authority saw the merits of the approach.

Although it does not do justice to its creative character, the VO is often called a programme organisation, a kind of extra organ to implement the negotiated accessibility interventions. The main objective of the VO is to keep the Rotterdam region accessible. How does the cooperation work? First, the programme and priorities should be discussed and politically approved by all parent organisations. If so, then the VO foundation can do whatever they have to do to make sure, they obtain the objectives of that programme and ultimately to keep the city and region accessible. How they achieve the goals is not disturbed, nor questioned by politics. Thus, the steering committee gives directions to the director of the VO and decides the agenda and content of the programme. The vehicle of the foundation allows for a more flexible and vigorous performance. The director is the only member of the foundation, but he can easily hire experts and people from the parent organisation to develop a strategy and implement the programme. Therefore, VO is a very flexible organisation that can act vigorously. The specific purpose of peak avoidances is always kept in mind. The director of the VO, A. Van der Bend formulated it as follows.

We have two basic principles. First, we have to aim for the result. If we do not achieve the result, we simply have to stop. Second, we can never achieve those results in a way that is already familiar to the way the parent organisations work. Because in that case we as organisation should leave as well.
(translated from Dutch, A. Van der Bend)

The VO foundation vehicle thus enabled and ensured creative solutions in fields that had not been explored before, such as marketing strategies. Take, for instance, the congestion-loving animal (*filedier*) campaign, alluding to herds of people taking the car during rush hour. However, the parent organisations were not always fond of, or were initially even sceptical of, the VO treading those new grounds. But that might have had to do with the organisational culture differences between the VO and its parents as well. The Port of Rotterdam had always been more strict; they focussed on the agreed points and wanted to know how things would happen. This often clashed with the innovative, creative, and flexible way of doing things in the VO. Although some people from the port authority worked part-time in the VO, the distance between the VO and the Port of Rotterdam remained large. This was less the case with, for instance, the Municipality of Rotterdam. The transport region Rotterdam (or city region) was still searching its specific role and rather stood on the side lines. The role of the province was marginalised and limited to membership of the advisory committee. In the region of Rotterdam, the province was not a major accessibility player (Ministerie van Verkeer en Waterstaat 2008). Years later, when the VO was acknowledged by foreign organisations as a best practice for mobility governance, the parent organisations gradually became less sceptical and even positive about their partnership.

Formally, the VO and the Foundation only elaborate and carry out the programme. It is an executive body, that acts upon the decisions made in the Steering Committee. The formal responsibilities or powers remain with the parent organisations. For instance, if the solution that has been decided by the VO programme demands new road infrastructures, this task is delegated to the parent organisation responsible for the infrastructure, i.e. Rijkswaterstaat. As such, the solution space of the partners is utilised and maximised. The VO limits its activities to engaging in activities that the parents cannot. In fact, you can consider the construction like this; each governmental layer, from the local to the national level, has its own independence, although in line with the higher level decisions. But those governmental levels now directly collaborate in the VO. When the objectives are shared or parallel, the VO now realises them in an innovative way. The cooperation agreement also stipulates that the managing director of the VO should be assigned to an official from the Ministry of Infrastructure and the Environment or Rijkswaterstaat because they could not be partner in the Foundation (determined by the Second Chamber). Appointing someone from their department ensured not only their connection with the VO, but also enabled them to keep an eye on the ministries' expenses (especially during the national mobility management programmes after 2012).

The VO was initially conceived to be a small organisation of around ten people that would engage in the coordination and streamlining of all accessibility projects and interventions. But over the years, when specific knowledge, other than that of the parent organisations, was required to realise the needed behavioural change, the organisation had to attract external people and the VO grew (60 people on the payroll at a certain point in time). The people working for the VO partly came from the parent organisations or were external experts. Knowledge was exchanged between the parent organisations and the VO. Only involving external people in implementing the VO programme was deemed risky; due to a lack of exchange, no lessons would be learned or specific knowledge or 'memory' would be built within the parent organisations. Likewise, a model of staff exchange and cross fertilisation was strived for.

“If at some point there is ordinary work again, then it just has to leave the VO and has to be returned to the existing parent organisations. (translated from Dutch, F. Bus)

| | |
|---------------------------------------|---|
| Steering committee | <ul style="list-style-type: none"> - Each of the parent organisations or parties has a representative in the Steering committee: the Municipality with the alderman for Transport and Traffic, the city region with the portfolio holder for Traffic and Transport, Rijkswaterstaat with the HID Zuid-Holland and the port authority with its director for infrastructure & maritime Affairs. - The Steering committee approves proposals and products of De Verkeersonderneming. - The Steering committee also serves as an escalation level for the Managing Director of De Verkeersonderneming and for the board of Account Holders. |
| Account holders | <ul style="list-style-type: none"> - Each of the parties and the director of the VO sits in this board. - Each account holder is the primary contact within his or her party for matters relating to the VO and the agreements in the steering committee. - They discuss the progress, issues and obstacles encountered by the VO and the foundation. |
| De Verkeersonderneming (VO) | <ul style="list-style-type: none"> - The VO is headed by a managing director. - The VO is responsible for drawing up and coordinating mobility management projects, while its implementation often lies with the VO foundation. |
| (Managing) Director VO | <ul style="list-style-type: none"> - The director of the VO chairs the steering committee. He does not have a vote, but has an advisory role in the steering committee. - The director of the VO is accountable to the steering committee on the basis of the annual plan of the VO. |
| Programme agency | <ul style="list-style-type: none"> - The programme agency carries out the tasks and assignments of the steering committee under the direction of the director, as set out in the cooperation agreement. - Furthermore, it is responsible for the communication, environment and relationship management of the VO and the foundation. |
| Foundation Verkeersonderneming | <ul style="list-style-type: none"> - The foundation is responsible for the implementation of the programme. - The foundation prepares the projects, takes care of the financing, executes tenders, directs the execution of the projects, or hires a third party to do so. The foundation also prepares agreements with third parties, negotiates and concludes the relevant conditions. - The board of the foundation consists of one person: the same person that is also the managing director of the VO. The board is charged with forming and implementing the general and daily policy within the objectives of the foundation, implementing the approved annual plan, and representing the foundation. - The director and the CEO of the VO is in principle the same person. |

BOX

Rewarding the peak avoidances in Rotterdam (Spitsscoren reward project)

It is interesting to see why people took part in the reward project; how they avoided the peak and whether their behavioural change was sustainable. The paper of Palm and van der Meulen (2014) evaluates the reward project in more detail. Here, the most interesting results are highlighted.

In 2009, soon after start of the A15 works, the reward project was initiated in the port area and went on until the end of 2011. Of the targeted people (i.e. car drivers) in the area, some 2000 participants were selected and became involved. The rewarding scheme included €5 in the morning peak (i.e. 6 – 9 AM) and €1.50 in the evening peak (4 – 7 PM)⁶⁶. From August 2012, the scheme changed to €3 and €3.50 respectively for morning and evening peak avoidances. A reduction of about 800 passenger cars (7%) was achieved in the morning peak and of about 600 in the evening peak (only rewarded from May 2011). After having adjusted the evening reward, peak avoidances increased but they never reached the morning peak results.

Figure 58 illustrates that the group of participants, i.e. their number and behaviour, was quite stable across the three years of the project. From the participants that started in 2009 or 2010, two-thirds were still active in June 2012. A significant aspect is that more than half of the participants has reported to maintain their peak avoidances without monetary reward. They probably got accustomed to the new behaviour and they experienced the benefits.

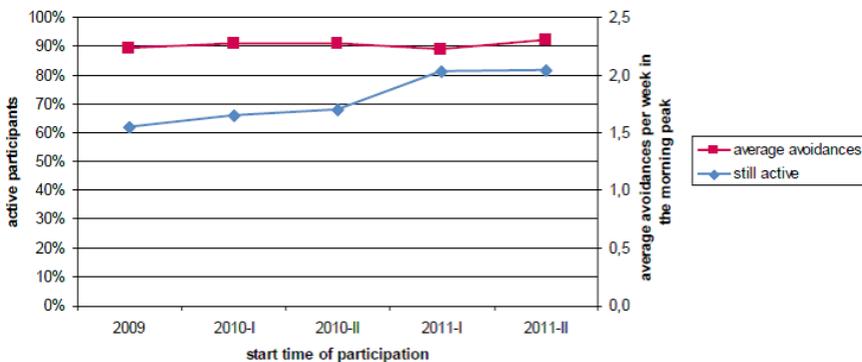


Figure 58 Participants and their degree of activity during the project. Source: Palm and van der Meulen (2014, figure 8).

66 Most participants that were avoiding the morning peak, logically also were already avoiding the evening peak (as a consequence of completing their working hours from a new starting point outside the peak), therefore avoiding the evening peak was rewarded less.

The major effect of the rewarding project was that car commuters changed their departure time or took another route, see Figure 59. 'Working from home' and 'changing travel mode' did scarcely occur, probably because the specific work conditions in the harbour did not allow those options. As there were no comfortable alternatives for the car in the area. The shift towards public transport was rather limited. Most of the participants only tried one new alternative that they did not use before. The major motives for participation are illustrated in Figure 60. The monetary reward was the most important driver among participants, followed by the benefits of less off-peak traffic, less congestion, and getting a smart-phone to communicate easily the project. Other motives regarding health benefits by using the bike, or trying new alternatives, were reported less.

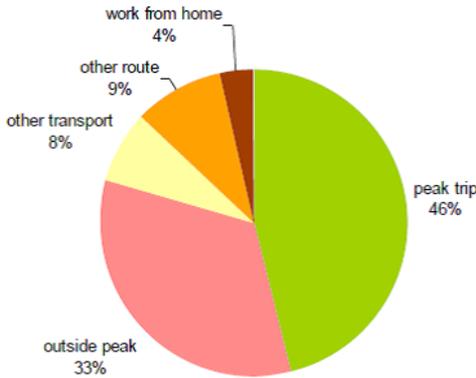


Figure 59 Travel behaviour of the participants in the morning peak. Source: Palm and van der Meulen (2014, figure 6).

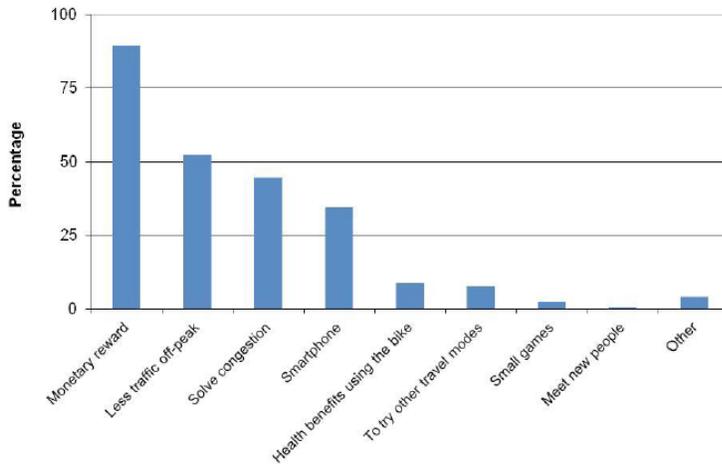


Figure 60 Motives for participation. Source: Palm and van der Meulen (2014, figure 9).

The development of a Marketplace for Mobility and the national programmes: ‘Beter Benutten’ (2011–2013) and the sequel ‘Beter Benutten Vervolg’ (2014–2017)

In the years following 2008, the economic crisis had struck and the financial prognoses for the coming years did not allow for new infrastructure investments. So in 2011, the Ministry of Infrastructure and the Environment launched the *Beter Benutten* programme (BB, ‘optimise capacity’ programme), focusing on smaller and smarter interventions for a better accessibility. The national BB programme, for which 170 million euros was reserved in total, was implemented by Rijkswaterstaat. In Rotterdam, the VO approach was paying off: two reward projects were successfully wrapped up (SpitsScoren and Spitsmijden010, resp. 715 and 1,638 peak avoidances). Therefore, the transport region Rotterdam and the other parent organisations wanted the VO to implement the BB programme for their region. Within the BB programme, the VO was expected to realise 15,000 peak avoidances, distributed across multiple initiatives as illustrated in Figure 61.

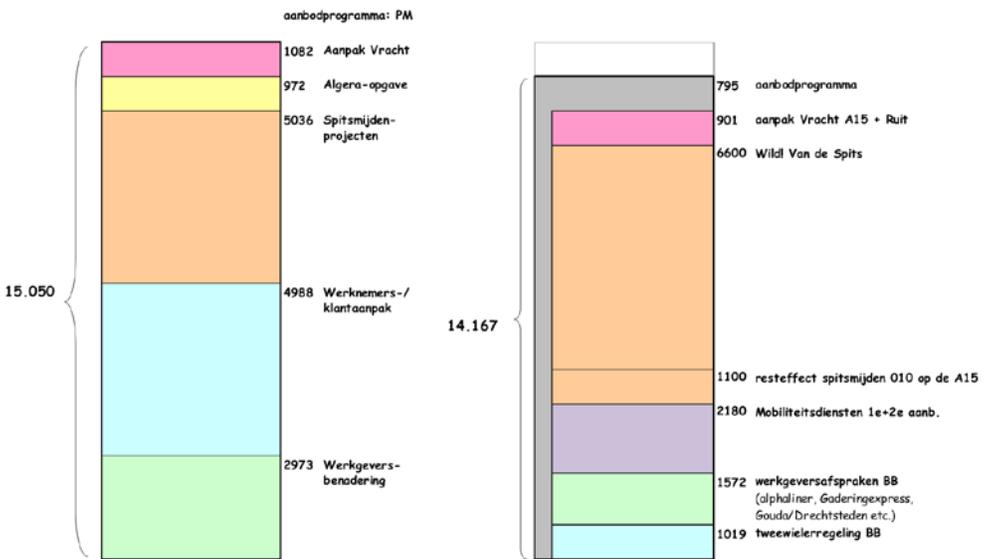


Figure 61 BB target peak avoidances (left) versus registered peak avoidances (right). Source: De Verkeersonderneming (2015: 29).

Since the BB programme was assigned to the VO, the latter became a different organisation. The government appointed a new director, Aernout Van der Bend, who had been involved in shaping the *Beter Benutten* programme at Rijkswaterstaat. For most of the BB programme (smart measures or demand-side management, and behavioural change interventions) the work could not be delegated to the parent organisations; they did not have experience in those fields. Meanwhile, the marketplace philosophy was elaborated, and was actually launched in the middle of 2013. As a result, the programme agency had grown considerably during those years. The BB programme focused not only on behavioural change and impact management, thus on the orgware approach, but also the software (ITS) and hardware (new infrastructure) pillars were elaborated, though they were always accompanied by an orgware agenda.

During the BB programme the VO aspired to fine-tune the cooperation between government, industry, and communities. The idea grew that the VO had to take up a more facilitating role instead of a resolving one. They had to engage citizens and employers more actively in the mobility behavioural turn. Therefore, a broader palette of alternative mobility options had to be created. Soon all efforts of the VO (whether these were campaigns, reward projects, employers or inhabitants approaches) were part of a major logic: considering mobility as a service (MaaS) and setting up a marketplace for mobility. The process through which they were integrated is elaborated in more detail in Section 6.4.1.

Future activities and anchoring the lessons from the Beter Benutten programmes

The municipality of Rotterdam asked the VO to support the mobility management during the infrastructure works on the Maastricht tunnel, starting in 2017. In collaboration with the MRDH, the VO also aimed at improving the accessibility of the Rotterdam-The Hague Airport. Furthermore, the marketplace for mobility was expanded. As such, the future of the VO seemed confirmed, although not all of the founding fathers agreed on the on-going collaboration in the exact form of the VO. As some argue that the VO was not destined to be a permanent collaboration or organisation.⁶⁷ (cf. R. Boshouwers).

6.4.1

Marketplace for Mobility Rotterdam

6.4.1.1 Re-inventing themselves: a marketplace for mobility (new problematisation)

To generate more transport alternatives or mobility options, the VO sought salvation in the market principle, they had to find a way to create a private third party. Besides, at the time, it was calculated how much the private actors and the public actors each spent on transport/mobility or infrastructure. Remarkably, private companies together had spent more money reimbursing travel expenses than what all public authorities together had invested in traffic management or infrastructure works. Travel expenses were ranked the third largest expense after salaries and housing (De Verkeersonderneming 2015). These findings indicated that there was a lot of potential for a marketplace for alternative mobility services addressing the specific travel demand.

By creating a marketplace for mobility and integrating it within a wider (mobility) behavioural change agenda, the VO engaged in organising its mobility as a service (MaaS). The VO even claimed to be the first international attempt to implement this new mobility concept at regional scale. Recently, MaaS has become a fancy but often vague concept that is embraced by mobility service providers. However, originally, it was defined as follows.

⁶⁷ R. Boshouwers (consultant marketplace for mobility Rotterdam), personal communication, 11/05/2017.

Mobility as a Service (MaaS) is a mobility distribution model in which a customer's major transportation needs are met over one interface and are offered by a service provider. Typically services are bundled into a package – similar to mobile phone price-plan packages. The vision is to see the whole transport sector as a co-operative, interconnected eco - system, providing services reflecting the needs of customers. The boundaries between different transport modes are blurred or disappear completely. The ecosystem consists of transport infrastructure, transportation services, transport information and payment services. (Hietanen 2014: 2-3)

6.4.1.2 Interesement: the philosophy behind the marketplace

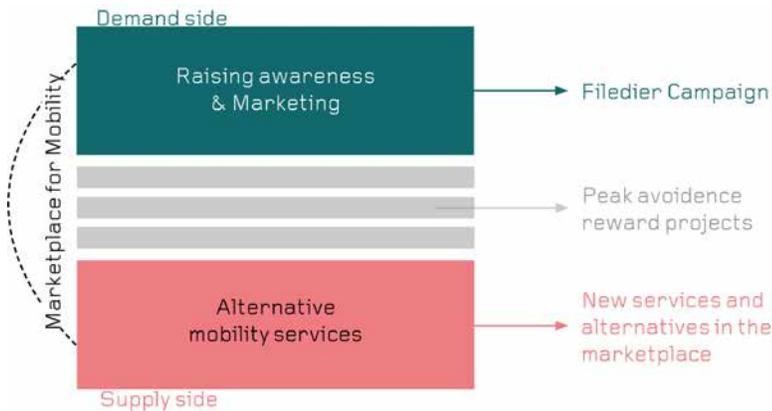


Figure 62 Overview of activities VO and positioning of the Marketplace for mobility.

Developing, facilitating, and innovating the marketplace for mobility is to be considered as the core business of the VO, see Figure 62. The orgware pillar is amongst the most acknowledged of all the VO activities, not only by the parent organisations, but also by foreign organisations that want to set up their own marketplace for mobility. The philosophy behind it includes both raising awareness and applying marketing strategies to launch alternative mobility services. The goal is to make the peak hour drivers aware of the other possibilities and of their sometimes irrational travel choices. Therefore, the *Filedier* campaign, *Wild! van de Spits*, was launched in the beginning of the BB programme, in 2011. The framing was important, as most people were not aware of their travel choices and of their own behaviour (often simply a matter of habit). To elaborate this pillar of the mobility market strategy, behavioural psychologists and marketers were integrated into the VO. During this period, the VO rapidly expanded. Given that the activities were totally out of the comfort zone of the parent organisations, they had to be filled in from the outside. In the *Wild van de spits!* campaign, the focus was on making people aware of their (bad) travel behaviour (see Figure 63). After a while, the tone of the campaign altered and the alternatives were positively approached (see Figure 64) (De Verkeersonderneming 2015).

**'IK BRENG EERST
DE KIDS NAAR
SCHOOL, DAN RIJ
IK METEEN DOOR
NAAR DE FILE.'**



**FIETSEN?
MIJ TE
GEZOND.**



**WEES GEEN FILEDIER
DOE HET OP JOUW MANIER**



**'FIETSEN?
EN ME
ZEKER
ZEIKNAT
LATEN
REGENEN.'**

**WEES GEEN FILEDIER
DE FIETS IS OOK EEN MANIER**
Kijk op filedier.nl voor meer alternatieven

Figure 63 Filedier campaign, raising awareness about habitual travel behaviour.
Source: De Verkeersonderneming (<http://www.filedier.nl/>).

**'IK LAAT DE FILE
AAN ME
VOORBIJ GAAN.'**



**'DE FILE?
MIJ TE
VEEL
WIELEN.'**

Iedereen
ontdekt alternatieven
op filedier.nl

Figure 64 Filedier campaign, addressing the alternatives in a positive way.
Source: De Verkeersonderneming (<http://www.filedier.nl/>).

To increase awareness, the *Wild! van de Spits* reward project was launched in Rotterdam. The idea behind this was that the participants (11,000 in the end) would continue to avoid the rush hour after the rewarding period, using services from the marketplace for mobility. With almost 6,000 peak avoidances per day the project was successful.

In addition to that campaign, the VO specifically addressed employers and residents (*werkgevers- en bewonersaanpak*) to make them aware of the alternatives. Accordingly, various (small) communities (inhabitants) and ambassadors (employers) emerged in the region. Good examples are employers such as Alphatron (producer of electronics), the Erasmus MC (university medical centre), and IHC (producer of offshore, dredging and mining equipment and vessels), who encouraged their employees to travel differently.

from peak hour driver, to peak hour avoider (translated from Dutch)
Van een spitsrijder een spitsmijder maken (R. Boshouwers)

6.4.1.3 Enrolment and mobilisation of allies: How to establish the Marketplace for mobility?

After having assessed the financial and legal constructions,⁶⁸ the traditional public tenders seemed the most adequate option to launch the marketplace for mobility. Within the strict format of the public tender, the VO added as much creativity as possible. As they wanted to end up with different mobility service suppliers, they aimed for 30 winners instead of one. Therefore, the tender consisted of a number of parcels, each targeting a package of peak avoidances to realise. As such, the public assignment of realising peak avoidances was distributed amongst a diverse range of new private suppliers. The VO co-financed 50%, but only if the promised peak avoidances were achieved (performance condition instead of intention). But the VO supported and monitored its new suppliers; accessibility managers were hired for additional professional support, and the VO campaigns and data were used to the benefit of the new-born suppliers. However, no cure, no pay!

To be able to launch the tenders quickly, the foundation vehicle was extremely useful. Meanwhile, there had been three rounds of public tenders. Furthermore, the mobility market even got a counterpart in Antwerp.

Together the new mobility services realise approximately 3,000 peak avoidances. Some examples of successful mobility services are still part of the range of mobility services within the marketplace for mobility:

- The service provider Waterweg Rotterdam BV carries out contract transport with the water taxi for various employers (initiators Alphatron, Van Oord, and later IHC and Hollandia). Employees living south of Rotterdam park their car in the 'Veranda' garage near the Feyenoord stadium and are transported by boat to the companies (and vice versa). This service offers 275 peak avoidances.
- Bicycle discount scheme (*Tweewieler Kortingsregeling*) is a purchase subsidy on a bicycle, (e-) bike or a scooter, that is largely put on the market by local bicycle dealers, and thus a mobility service 'avant la lettre'. At the end of 2014, there were almost 2,000 participants who altogether realised 1,019 structural peak avoidances.
- The cooperation with the Gadering Express, a relatively small contract transport service (by small vans), is also pursued. The operation of the express service is entirely privately funded from 1 January 2015. The service has 135 customers, the average number of people boarding per day is 40, which accounts for 30 structural peak avoidances.

⁶⁸ In addition to the instrument of the public tender, also the grant-based support and a Mobility fund were considered.

Problematisation

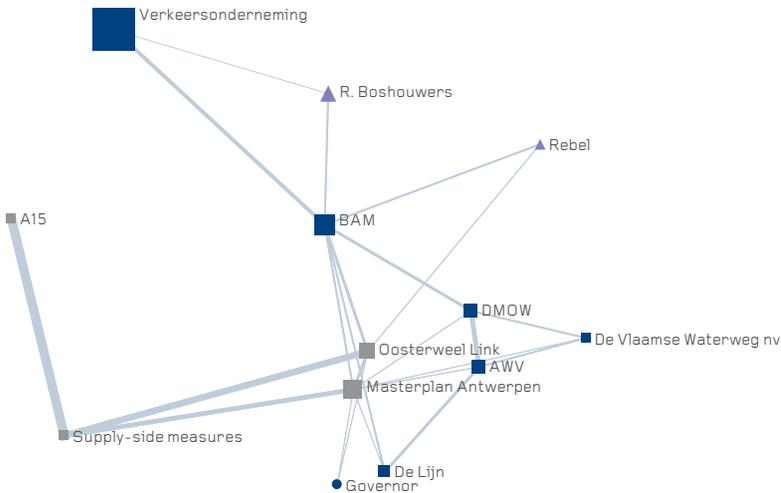


Figure 65 Problematisation – the city’s role in the accessibility and communication about it

The origins of the marketplace for mobility cannot be separated from the implementation process of the Masterplan 2020, and the Oosterweel Link project (this will be elaborated in chapter 7). In that process, the city of Antwerp took on a rather marginal role, to the city’s regret, as they did not approve the impact management and communication strategies of the BAM, the company leading the process. During the negotiations that eventually forced a breakthrough, the city reclaimed a more central role in its own mobility story. This is no surprise, as the major part of the works was situated on the city’s territory. A transparent governance structure was set up by the city to guarantee a smooth communication and alignment among the different masterplan projects and sites around Antwerp⁶⁹.

Interessement

As illustrated in the actor network diagram, in Figure 66, the city reconnected with their city’s mobility, got itself into the network and took the lead in the communication around the projects (central position, right next to the BAM).

⁷⁰Accordingly, the city could keep an eye on the accessibility information, where it

69 At the time, the mandate of the intendant had not yet been introduced, so there were no super workshops guaranteeing a broad cross project communication and in which all parties were involved.

70 Note that the actor networks shown here are a zoom of the actor network of the VO, as such, therefore the VO is displayed as a big node, while in fact, for the case of Antwerp, that link has been very important but the VO as actor has become rather marginal in the further story of the marketplace for mobility in Antwerp.

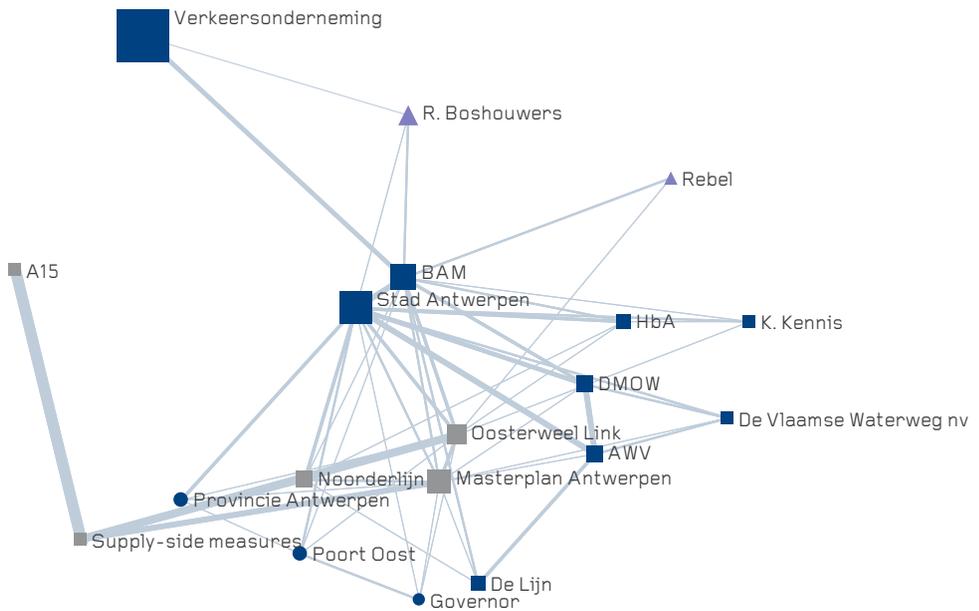


Figure 66 Interessement of the city of Antwerp – taking the lead in the accessibility communication

went wrong in the past, and elaborated the ‘Smarter towards Antwerp’ (*Slim naar Antwerpen*) campaign; an effort to cluster all communication about construction sites or accessibility (how to reach the city as an inhabitant, visitor, etc.). Several masterplan projects became interested with the marketplace actor network and Slim Naar Antwerpen: The Noorderlijn, the Oosterweel Link, etc. Before, this was provided by the various instances or partners in the projects themselves. For instance, BAM dealt with the impact management, whereas the public transport works were communicated by De Lijn. The result was a dispersed and not always transparent communication, and impact management.

Although the Masterplan 2020 for the region of Antwerp initially intended a focus on demand-side management, this pillar was soon forgotten; only the infrastructural pillar (supply side) was elaborated. The city of Antwerp tried to re-engage with an integral demand-side management in the *Slim naar Antwerpen* platform. As such, it entailed more than the previous impact management measures (*minder hinder maatregelen*). A marketplace for mobility was developed to provide more alternatives to cars. Therefore, the city of Antwerp visited the VO in Rotterdam, by mid-2015. City officials wanted to investigate the communication and the impact management strategies of the VO, to guard the accessibility of the city. Later, R. Boshouwers, one of the initiators of the marketplace for mobility in Rotterdam was hired to support the setup a marketplace for mobility in Antwerp.

Enrolment and mobilisation of allies

The first call for projects took place in the autumn of 2016. An independent jury selected ten projects from the various entries. The jury consisted of representatives of the Flanders Institute for Mobility (*Vlaams instituut voor Mobiliteit, VIM*), the Flanders Institute for Logistics (*Vlaams instituut voor Logistiek, VIL*) and De Verkeersonderneming Rotterdam. The following ten ‘winning’ projects achieved

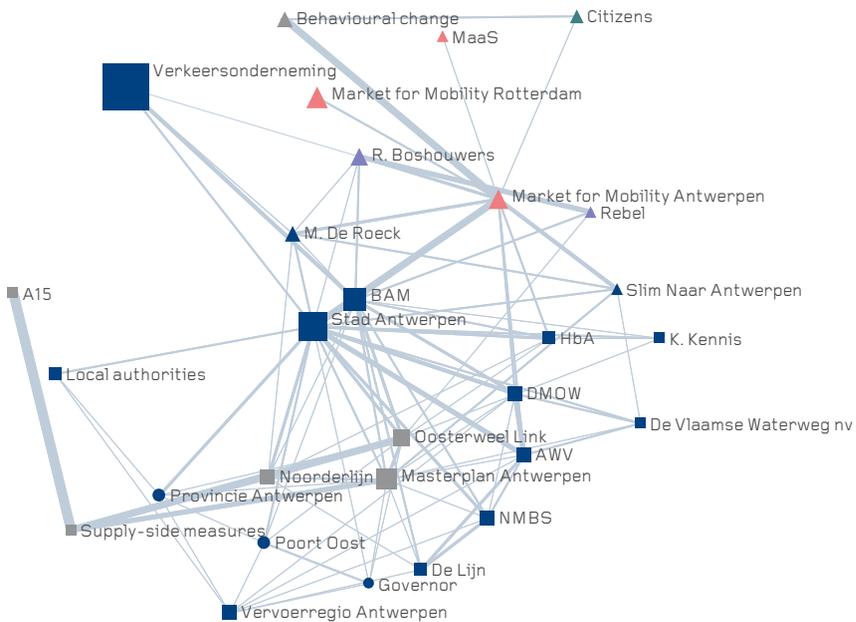


Figure 67 Enrolment and mobilisation of allies: establishing a market for mobility in Antwerp

peak avoidances by offering feasible transport alternatives or services (<https://www.slimnaarantwerpen.be>).

- **Avantida** – DepotX launched an internet-based solution to request alternative drop-off/pick-up locations outside Antwerp for empty sea containers. In this way freight transport in the bottleneck zones could be reduced.
- **Blue Line** Logistics is committed to a modal shift through an innovative inland shipping solution, Pallet Shuttle Barges, and the use of (temporarily) idle capacity on transshipment quays in the city.
- **Plastiek Van Wauwe**, a dealer in plastic materials for construction and industry, created an extra collection point in Schoten. This allowed customers to avoid the bottleneck zone in Deurne, in particular at the crossing with the Albert canal.
- **Plastiek Van Wauwe** also created an extra pick-up point in the southern edge of Antwerp. This allowed customers coming from the south to avoid congested zones.
- **Cloudbike** would use 'Bike-sharing on a cloud' to offer a fleet of 300 shared bikes via a smartphone application. This system would become complementary to the existing Velo bike share system.
- **Jobruil.be** (job exchange platform) is a unique platform that links employees with the same skills and interests via an advanced database. Employees can then exchange their jobs and work closer to home.
- **Mellowcabs** are compact electric vehicles used in strategic locations to accommodate the first or last miles of commuters or visitors.
- **Taxistop** wanted to expand the carpool.be platform in 5 pilot companies in the port of Antwerp. This resulted in an extended database, so that a large number of extra carpool matches could be reached.

- **BAAV** – The office bus allowed employees to work during their home-work journey. The commuting time was then considered working time.
- **B2Bike** – Bike2Go is a user-friendly system for companies that want to offer electric service bikes to their employees, so that they become less dependent on the car for work-related trips.

In addition to those ten initiatives, 4 strategic partnerships were forged after a European tender in April 2017, delivering three demand-side management initiatives. Together the three initiatives were to obtain 3,000 peak avoidances (<https://www.slimnaarantwerpen.be>).

- **TimesUpp, the personal travel assistant**

TimesUpp is a personal travel assistant that warns the user of unexpected delays, even before the journey starts. You indicate when you want to arrive at your destination and the app shows the best route and calculates the optimal time of departure. The app encourages the user to behave in a smarter way, for example by leaving earlier or later, or by choosing an alternative transport mode to replace the car. TimesUpp has been developed by Innovactory International, a Dutch company that has realised over 1,000 peak avoidances in Rotterdam with such an application.

- **Olympus Mobility**

The Olympus Mobility app offers employees a total solution for different modes of transport. The app allows the purchase of tickets for the train, tram, bus or bicycle and even allows the payment of parking fees. The employer can thus easily monitor the mobility budget per employee with only one invoice for the entire range of used transport modes.

- **Location-related travel advice with the Slim to Antwerp app (SNAPP)**

Where many apps stop at the front door or on the car park, SNAPP leads the user all the way up to the office chair. This can be a useful service for hospitals, cultural centres, event locations, and restaurants. The app allows an accurate estimation of the total duration of the journey and the exact route. Calculations incorporate for instance how long it takes from the bus stop or parking lot to the conference room, etc. SNAPP is being developed by Advier, a Dutch company that has realised a substantial amount of peak avoidances in the region Arnhem-Nijmegen using this kind of technology. The app is developed in collaboration with Localise, a Belgian company that partners Google Maps.

Like the philosophy in Rotterdam, the Antwerp marketplace also supports those new-born initiatives intensively; the strategy engages in a citizens/employees approach and an employers' approach to target and trigger the mobility behaviour or foot-print of the respective citizens/employees or employers in the impacted area. The *Slim naar Antwerpen* platform not only covers the information on accessibility and construction sites pillar, but also creates alternative options for employers, commuters, and visitors (see Figure 68). In addition to the new mobility options delivered by the marketplace, the strategic partnerships, and the collaborations with citizens and employers, the Slim Naar

Antwerpen umbrella takes other initiatives as well to reach a behavioural change. The marketplace offers a discount arrangement for bikes and provides service boxes to increase bike comfort. Some pilot projects around working smarter (*Slim Werken*) were set up. Networking events to exchange learning experiences regarding the mobility footprint of companies are also fostered. Furthermore, various (often specific, individual) information tools have been developed and fiscal advice and extra training are provided to stimulate the demand-side management strategies. Nevertheless, the solutions and investments by the *Slim naar Antwerpen* approach need to be much more creative as the financial means of which it disposes are about 10 times smaller than the means of the VO to establish the marketplace in Rotterdam.

The Marketplace for Mobility was conceptualised and launched before an intendant had set foot on Antwerp territory. There were then no super workshops, nor could one speak of a Future Covenant or transport region Antwerp. For the civil servants developing and monitoring the *Slim naar Antwerpen* campaign, it is not clear how their platform and services will be merged with the processes of the recently established transport region of Antwerp after the Future Covenant. The city of Antwerp is trying to keep engaged with the mobility decisions on its territory as much as possible. Yet some actors stated their fear that the mobility issue in Antwerp remains within the decision and action of a Flemish perspective only. Some recall with regret the ‘Poort Oost’ platform⁷¹ led by governor Berx, in which the city of Antwerp did not have a major say.



Figure 68 Overview of the offered tools and services by the Slim naar Antwerpen platform. Source: city of Antwerp.

71 a platform to build a (public) support base in the Oosterweel Link project

6.5

Results and discussion

In the region of Rotterdam, the vested mobility actors opted for a radical orgware shift, by adopting a co-evolutionary governance, that structurally coupled to and facilitated a CAS of mobility. Both aspects of our two tiers approach were addressed: structurally coupling the actors, and setting the 'right' conditions.

VO orgware – Structurally coupling the actors

The vested public actors started the cooperation initiative to keep the region accessible in times of road works and ever-increasing car traffic. Not only did the vested actors get involved, but also citizens, daily commuters, and employers. Thus, in addition to public actors also civil and business actors became part of the actor network and were targeted appropriately (cf. citizen approach versus employers approach).

Though the VO can be considered a new public actor, the link with the parent organisations has not been broken. More importantly, the parent organisations remain central in the actor network diagram, but they are supplemented by the VO; the actor network of the VO became a supplementary network to their own. To maximise the capacity and accumulate knowledge and experience, the VO only engages in actions or projects that the parents are not familiar with. Each actor keeps his specialty. The structure (cf. cooperation agreement) of the VO has been adapted a few times over the years, to fit the functioning of the VO and the evolving challenges to tackle. Political interference remains situated at the level of the programme (discussed by the steering committee); once the programme is decided, the VO is entrusted to carry it out. Because they are held accountable for the programme towards the steering committee and the board of account holders, the progress was closely monitored, for instance, with regard to peak avoidances and number of involved companies in the employers approach. The VO has always cultivated the relation with its parent organisations. Although that is sometimes a balancing act, as the management cultures of the parents sometimes largely diverge. Yet, the balance has always been found so far.

When the *Beter Benutten* programmes reserved national funding for smart measures, the VO was assigned to roll out those programmes in the region of Rotterdam. As such, the VO actor network has mobilised all possible means for the accessibility in the Rotterdam region. If we take a look at the mobility orgware of the VO, we see that all parts of the schematic multi-mobility market model are targeted (Figure 69). Whereas the parent organisations already cover all mobility arena's, the VO aligns them and focuses on the gaps: the behavioural change and attitudes, and the creation of more alternatives to cars. We can say that the VO not only knows how to link networks to one another, but also how to create consistency between all the subsystems of the CAS.

Setting the conditions for change

Thanks to a political momentum, the vested actors from all mobility markets got engaged in the VO, a kind of recombination and innovative association between already existing parties, entrusted with keeping the region accessible. As the

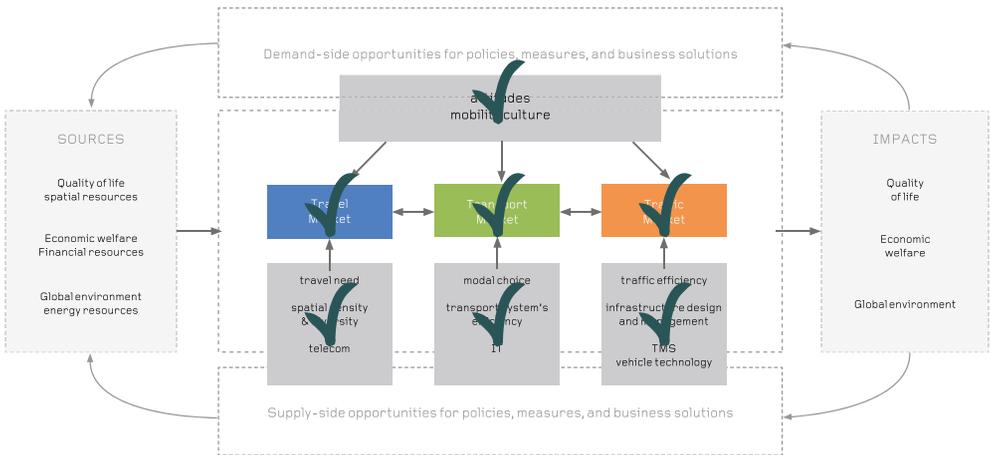


Figure 69 Schematic overview of the VO orgware.

involved parent organisations covered all three mobility markets, the opportunities for finding solutions were many; one could aim for an integral planning solution. Solutions combined orgware, software, and hardware measures, and targeted all parts of the mobility CAS. Though the origins of the VO are of infrastructural nature (A15), the solutions and interventions exceed the infrastructural sphere. The travel demand and accessibility issues were examined thoroughly; all stakeholders from employers to employees and inhabitants were addressed. But as those efforts were not sufficient in curbing the peak travel demand, a marketplace for mobility was launched, to provide Mobility as a Service. The legal and financial frameworks were set for new mobility providers (niches) to enter the scene and take down the peak travel. Furthermore, the evolutions were monitored according to peak avoidances. As such, the parent organisations could keep track of the evolutions of the VO. The successive BB-programmes, in which the VO got involved not only mobilised more means, but also left their marks on the organisation. The VO grew, and although the organisation remained faithful to its creative spirit and 'Pietje Bell' role (cf. the marketplace and the *Filedier* campaign), it rather became a programme implementation organisation.

With the BB programme agreements, the cooperation between the parents and the VO has been set for the next years. Future structural couplings between the various mobility markets are ensured, as the programme approach got taken up in the multi-year infrastructure, spatial planning and transport programme (MIRT, *meerjarenprogramma infrastructuur, ruimte en transport*), that is composed by the national and regional level together. In summary, the mobility orgware in Rotterdam develops beyond the plan and even beyond establishing new public parties, because the association with the citizens and businesses was made.

As the marketplace for mobility proved successful regarding peak avoidances, the VO gained widespread interest. Some of the founding fathers of the marketplace for mobility in Rotterdam even got involved in setting up such a marketplace in

Antwerp. The financial means, the fiscal, and legal framework are, however, very different in Flanders. By creating the marketplace for mobility, the city of Antwerp aspired to keep the city accessible during the coming years of road works in and around Antwerp (cf. Chapter 7).



7

Large Infrastructure projects

Parts of this chapter have been previously published as:

Van Brussel, S. (2017). What if large infrastructure project processes adopted a coevolutionary character? Discussing the merits and consequences for the Oosterweel Link project, Antwerp. In J. A. Ferreira, J. M. Simões, S. Morgado, E. Marques da Costa, J. Cabral, I. Loupa Ramos, J. Batista e Silva, & M. Baptista-Bastos (Series Eds.), *Book of Proceedings AESOP Annual Conference 2017. Spaces of Dialog for Places of Dignity. Fostering the European Dimension of Planning* (pp. 2833-2843). Lisbon: Universidade de Lisboa.

Van Brussel, S. (2016). De patstelling voorbij? Complexe infrastructuurprojecten in een actor-netwerk perspectief toegepast op het Ringland-initiatief. In René van der Lecq & E. Vanempten (Eds.), *Plandag 2016* (pp. 232–241). Presented at the Plandag 2016, Stichting Planologische Discussiedagen.

7.1

Selection of case and specific methodology

The Oosterweel Link LIP (Antwerp, Belgium) is the research object of this case study for several reasons. The project process is already long lasting (mid 1990s – ...), the project is controversial and the process can be characterised by various rounds of opposition resulting in change. Furthermore, there is a sense of urgency as the congested mobility situation necessitates action. The notion for precisely answering to mobility issues has transformed over the years. The project process is characterised by several rounds of opposition during which the course of the project drastically changed.

The theoretical framework suggests looking into the actors first. By following the actors and their actor networks, the project is unravelled; the origins and evolutions are traced. The ANT-translation phases were used to structure the Oosterweel Link project's course. This allowed to figure out which actors were in charge or outlined the project. Second, the conditions are discussed; the setting in which the actors took their decisions and developed their own goals. A roundtable discussion was organised to let the Oosterweel Link protagonists elaborate on the project's planning process. They were asked to give their opinion about the proposed co-evolutionary governance. They discussed how they could understand such an approach, when applied to the Oosterweel Link project.

Ringland was distinguished as an interesting citizen movement to follow. This because the initiative acted differently from the previous ones regarding organisational aspects, influencing the agenda and making the ideas and concepts public. Therefore, the initiative was followed in its initial footsteps and an ethnographic research method was adopted. Ringland gave us the opportunity to take note of their day-to-day activities by giving access to daily email correspondence, frequently organised board meetings, events organised by Ringland, etc. For that part of the analysis we concentrated on the time-lapse in which Ringland expanded; from the early start at the end of 2012 until the end of 2016. After that period, the major evolutions were still registered, but an active observation of the initiative was no longer necessary. The initiative had matured by then and got involved in the Oosterweel Link story. As such, the different sides – *or even camps?* – of the project were merged somewhere in the last translation phases.

7.2

Complex interplay of different actors and their translation processes

7.2.1

First translation round: How to solve mobility issue in and around Antwerp?

7.2.1.1 First Problematisation – once upon a time an optimistic and futuristic infrastructure story starts... (1995-2005)

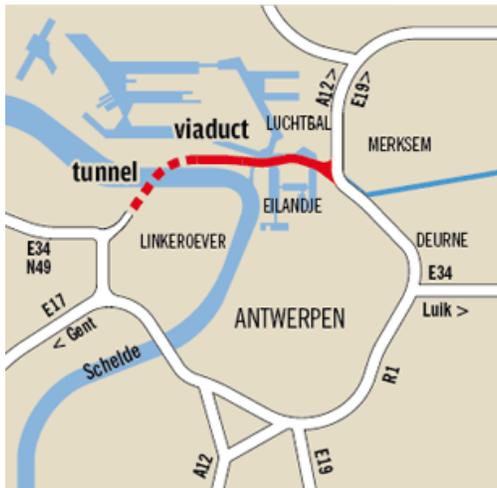


Figure 70 The Oosterweel Link section (red). Source: Het Nieuwsblad, March 4, 2009, <http://www.nieuwsblad.be>.

In 1995, AWW, a part of the Flemish administration *Admin LIN* launched the start of a new masterplan to counter the structural congestion in and around Antwerp. Soon the idea comes to mind that a third Scheldt crossing would solve the problems. This extra crossing would serve the completion of the Antwerp ring road. The idea gained ground and a consensus about the obligatory passage point (OPP, i.e. extra river crossing, as to complete the inner ring) was shaped. As that connection was situated somewhere around the old village of Oosterweel, the project was soon labelled the Oosterweel Link (Figure 70). Now that the OPP was settled, the challenge was to get those projects and plans implemented. Who should be involved and which organisations would bring the project to an end? Of course, another main question was: where could the project be situated? As such, the next step was to think about governing the project and exploring possible options to choose the exact route. In the mind of the former governor (C. Paulus), however, the project had already taken major proportions. He perceived it the crown jewel of the masterplan and of his province (Vanveldhoven and Lauwers 2010, Vanveldhoven, Lauwers, and Goethals 2009).

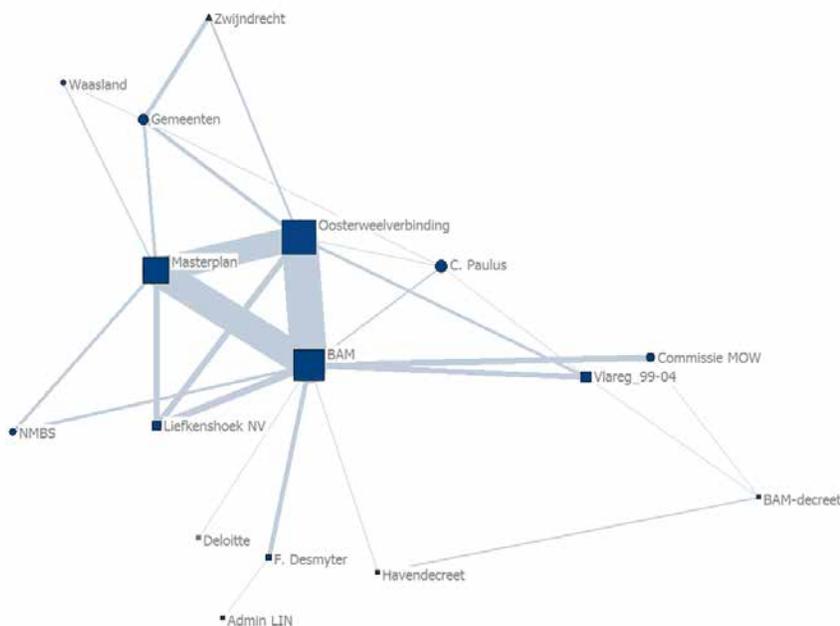


Figure 71 The actor network of the Oosterweel Link project the first project years

7.2.1.2 Interessement – elaborating the Oosterweel Link

To define the precise route of the project a study was carried out by ABM (Atenco, Belgroma – Grontmij, and Maunsell). This study initially came up with six plausible routes. In the end, the consultants added a seventh possibility, a combination of parts of the previous options. We added those route scenarios in appendix 3. The city of Antwerp, the Port of Antwerp, the province of Antwerp, the Flemish administration and some other institutions approved this ‘optimised medium route’, which later would be known as the notorious ‘BAM route’. This seventh option would be further studied and elaborated by a consultancy cooperation (Verhoeven and Ysebaert 2008).

7.2.1.3 Enrolment of the Oosterweel Link project

The Flemish government approved the ‘Masterplan Mobility Antwerp’ on 15 December 2000. It was agreed to levy a toll for the financing. To ensure a smooth and efficient implementation of the plan, it was also decided to set up a public limited liability company: BAM (*Beheersmaatschappij Antwerpen Mobiel*). This would allow a more flexible way of working and the recruitment of more specialised personnel on market terms. In September 2001, the framework agreement, including the study work, the drawing up of the project specifications and tendering, and the project guidance and monitoring for the Oosterweel link and all other masterplan projects, was granted to the joint venture TV SAM (Study group Antwerp Mobile). This consultancy consortium comprises three large consultancy companies (Belgroma, Technum and Gedas⁷²).

72 Belgroma would later become Grontmij, and Gedas became Arcadis.

7.2.1.4 Mobilisation of allies of the Oosterweel Link project

The framework agreement was established for the entire duration of the implementation of the Antwerp Master Plan for Mobility. The realisation period was estimated at six years, but it would soon be on the increase. In October 2003, TV SAM estimated that the work could not start until 2005 at the earliest because of the procedures and consultation moments.

Increasingly, the Oosterweel Link project was encapsulated in a broader network, that had been initiated by the Flemish government and administration. Soon, it was surrounded by other governmental actors and factors, infrastructural agencies, plans (cf. Masterplan Antwerp), legal documents, new organisations to deal with the project, municipalities that got involved (see Figure 71).

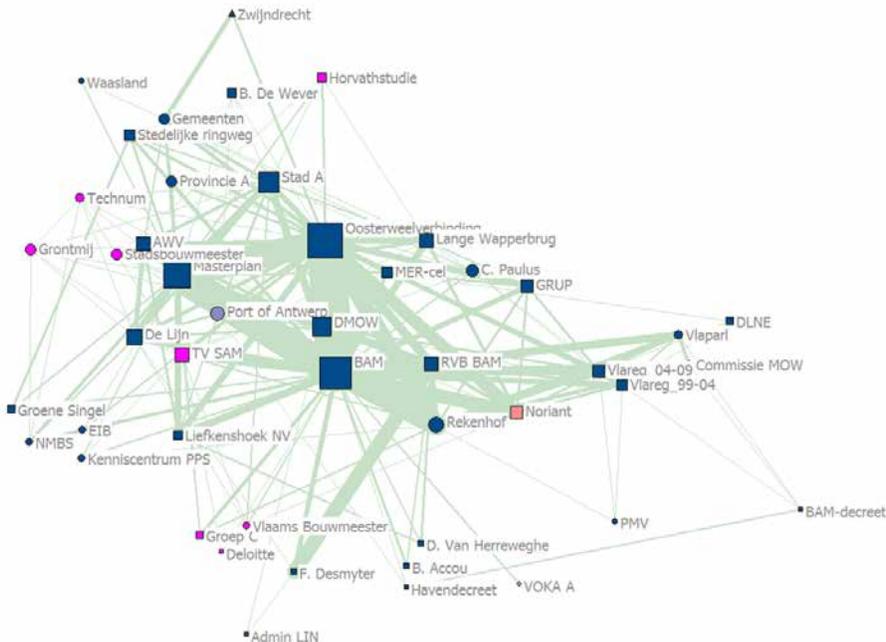


Figure 72 The actor network of the Oosterweel Link project in 2005

To promote and build support for the Masterplan and the Oosterweel Link project, the governor – very eager himself to see the project realised within his mandate – organised a States-General. This support base event brought together the various but vested mobility organisations: civic society actors and governmental actors. By 2003, a management company came into being (BAM, *Beheermaatschappij Antwerpen Mobiel*) to take over the project management and to replace the role of the Flemish administration in fulfilling the framework agreement with TV SAM. A close collaboration between the consultants of TVSAM and BAM started. Though both companies TV SAM and BAM were private, political interference was never far away. When determining and securing the route of the LIP in a regional implementation plan (GRUP), they preferred to follow the (at that moment still optional) environmental impact assessment procedures.

7.2.2

Second translation round: the specific route choice and its implications

7.2.2.1 Problematisation – The awakening after having seen the model and the costs increase...(2005-2009)



Figure 73 Model of the Lange Wapper double deck viaduct skimming over the city of Antwerp without and with underlying urban fabric. Source: (right) <http://4.bp.blogspot.com>; and (left) <http://www.bavo.biz>.

When the BAM, in 2005, eventually showed the model of the Oosterweel Link to the press and the Flemish parliament (Figure 73), it caused a lot of buzz. At first, reactions were almost unanimously enthusiastic. But the model was met with great resistance afterwards, during the public inquiry of that procedure where the model was shown to the general public for the first time. A first activist group voiced its concerns and came up with its own alternative route for the project. StRaten-generaal, suggested to alleviate the city from transit traffic and complete the ring road much further away from the city than the initially chosen route.

7.2.2.2 Interesement of the opposition against the Oosterweel Link

The city of Antwerp also gradually became alarmed. The city council wanted to become engaged in the project⁷³ and tried to stall before making a decision. They ordered another study of alternatives: the Horvat study, named after the Horvat consultancy agency that carried it out. In addition to the BAM route with the Lange Wapper viaduct, this study also took into account the tunnel variant of the BAM route (ABM route scenario 2, later called the 'Horvat-route', see Figure 75) and the alternative of stRaten-generaal. The research was rushed and concluded that a tunnel option was more expensive than a viaduct. Hence the approval was given for the viaduct landmark and the tunnel option was abandoned. The next step was launched. Building consortia were notified with a call tendering; the BAM route could be designed, further elaborated and eventually implemented.

⁷³ In the first years of the project, a visa scandal at the Antwerp city council resulted in the discredit of local politicians that became side-lined in the Oosterweel Link project story.

and advise the BAM on their final decision. Soon preference was given to the offer of the Noriant consortium. Though Noriant BAFO was criticised by the quality division for not being the most economical, nor most qualitative one, the other consortia were excluded (Penris and Peumans 2007). The governor had an eye for the architectural beauty of the Lange Wapper viaduct⁷⁴ for his province (Vanveldhoven and Lauwers 2010, Vanveldhoven, Lauwers, and Goethals 2009).

Members of parliament had difficulties accepting that alternative routes were still taken into account during the environmental impact assessment (EIA, *MER*), while the building consortia finalised their BAFO according to the BAM route. In addition, by absence of valid competitors, the total cost of the Oosterweel Link proposal could increase from 0.6 to 1.3 billion euros. This raised many questions about the communication and the transparency of the BAM and the opposition towards the deal with Noriant grew from then on. The precise roles and relations between TV SAM and BAM remained vague and the budgetary resources for the conducted research were repeatedly questioned.

7.2.2.4 Enrolment of the chosen policy

In response, BAM commissioned PWC and Deloitte for an external audit of TV SAM. The commission followed the dossier more closely as of then. From 2005, BAM had to present regular progress reports in the parliamentary commission. The Court of Audit of Belgium also monitored the achieved progress (Peumans and Penris 2005). Due to the accumulated delays and compensation measures, the total cost estimates continued rising. Therefore, at the end of 2007, the Flemish government established a price cap for the project of 1.8 billion euros (Penris and Peumans 2007: 7).

During this phase the actor network demonstrates that the plans for the Oosterweel Link are further developed, but in a technocratic shielded way. When looking at Figure 72 and Figure 74, we notice that TV SAM and BAM held the key to the design and planning process within the regime and niche alternatives from *stRaten-generaal* were blocked.

7.2.3

Third translation round about health– From landmark to ... scratch? (2008-2012)

7.2.3.1 Third problematisation – the opposition gives a first real stab

While the BAM proceeded with the Oosterweel Link project, the opposition did not stand still either, cf. actor network diagram in Figure 77. Earlier, *stRaten-generaal* had brought up the route choice discussion and had proposed its own alternative. In

74 The Lange Wapper viaduct was designed as a combination of a tunnel that gradually converted into a double-deck viaduct above the docks and the northern part of the city that was to be developed at the time (*het Eilandje*).

response to that, the city undertook a first rather marginal initiative in the process with the Horvat study. Though this study did not change the course of the project, it did not stop the activists or citizen movements to proceed to their opposition. Various concerns were voiced in parliament: about the non-transparent decisions, the role division between BAM and TV SAM, and about the increasing total cost.

In 2008, Ademloos ('Breathless') a new civil movement stood up to put the harmful environmental health impact of such an infrastructure project on the Antwerp citizen on the agenda. Ademloos was experienced with communication strategies, whereas stRaten-generaal mainly focused on the technical aspects (e.g. alternative route) and quality of life issues in general. A fruitful collaboration between the two civil movements had started, whereby each organisation remained faithful to its own specialty. In addition to citizen movements, so did academics condemn the political (infrastructural) choices and, above all, how decisions were taken. George Allaert, a renown Flemish professor in urban planning, did not shy away from stating that the Oosterweel link was a medieval project (Verelst 2008). The obligatory passage point in this translation round was the agreement on the negative health impact of the Lange Wapper viaduct on the city (e.g. by particulate matter emissions) and urban development.

7.2.3.2 **Interessement and re-enrolment of the Oosterweel Link camp (chosen policy)**

Under the pressure of an increasing opposition against the Oosterweel Link project, the Flemish government had all alternative routes for the project studied once more (L.B. 2010). In July 2008, Arup/Sum starts investigating the alternatives. The expectations of the study were high. However, in March 2008 Arup/Sum presented a striking conclusion: none of the proposed routes excelled the others overall. Consequently Arup/Sum proposed to elaborate an alternative route; one that located the third river crossing more norther, similar to the proposal of stRaten-generaal. The Flemish government approved this additional work on March 28, 2009 ('Dubbelbesluit'). But in that decision the government simultaneously instructed the BAM to file the building permission for implementing the Lange Wapper. Nevertheless, due to the Arup/Sum study, the final agreement on the routing of the project was postponed to the next legislature.

Soon after the decision, the civil movements launched a petition against the BAM-route of the Oosterweel Link project and together they managed to enforce a referendum. Their support base grew steadily (Moolenaar 2008, Verelst 2011: 163-165, 185). On October 18 (2009), the citizen movements victoriously terminated the Lange Wapper chapter on their first public event; the majority of the citizens voted against the viaduct in the referendum (Vandenbergh 2009). But they criticised that their alternative route was not properly taken into account in the EIA (*projectMER*), which they were only allowed to consult much later. Besides, the building consortia were elaborating their infrastructure design for the Lange Wapper viaduct on the BAM route while the environmental impact assessment, comparing the different alternatives, had not yet even been concluded.

7.2.3.3 Enrolment and mobilisation of allies within the opposition camp

In July 2009, the further research of Arup/Sum unexpectedly concluded that the studied Arup/Sum route tunnel alternative was technically feasible and economically viable. More importantly, at all levels their alternative outperformed the Lange Wapper viaduct (the BAM-route). Swayed by the growing civil opposition, the city of Antwerp organised a referendum on October 18 (2009). That referendum resulted in rejecting the Lange Wapper viaduct (Brinckman 2010). As the permits and plans were delivered for the viaduct structure, the procedures of the regional spatial implementation plan and the associated EIAs (and their public inquiries) had to be re-done for the tunnel-variant. The referendum had transformed the project and a new full-rebidding was unavoidable. This compromised the financial agreement that had already been made with the building consortium Noriant for the *Lange Wapper* (Dendooven 2010, Verstraete 2010).

In the meantime, the civil movements elaborated their alternative, the ‘Meccano-route’, an optimisation of the Arup/Sum-route (that in turn was based on the earlier stRaten-generaal-route). Together with Forum 2020, a group of influential experts and captains of industry in Antwerp, they had their Meccano-route studied by an independent research institute (TML). The results of the TML study preferred the Meccano-route to the BAM route (Yperman & De Ceuster, 2010). In response, the Flemish administration instructed the Flemish Traffic Agency to investigate the TML study (Grispen, 2011). The story is comparable to a ping-pong game.

7.2.3.4 Mobilisation of allies of the chosen policy

In response to that sudden plot twist, in 2010, the Flemish government promised to run through the alternatives once more and include them in the environmental impact assessments (EIAs) before taking a final decision. These EIAs were necessary for the approval of the renewed Masterplan 2020. That much needed update broadened the project’s scope and regarded multimodal solutions for mobility and included mitigating measures that compensate for negative impacts on quality of life aspects of the plan.

In 2012 a new research institute (Anteagroup) was entrusted to carry out the environmental impact assessment, including the BAM-route (tunnel variant), the Meccano route and five other alternatives (one of which was the Oosterweel North-route), see Figure 76. Implementing the tangents A102 and R11bis was already incorporated in the Masterplan 2020 at the time.

On February 14th 2014, based on the finalised EIA (planMER Oosterweel) by Anteagroup, the Flemish government decided to follow the chosen path of the BAM route (stated policy, ‘*beslist beleid*’). To refrain from further legal actions Noriant received a settlement of 37.19 million euros (Moens 2014), a measure that was met with dismay in parliament.

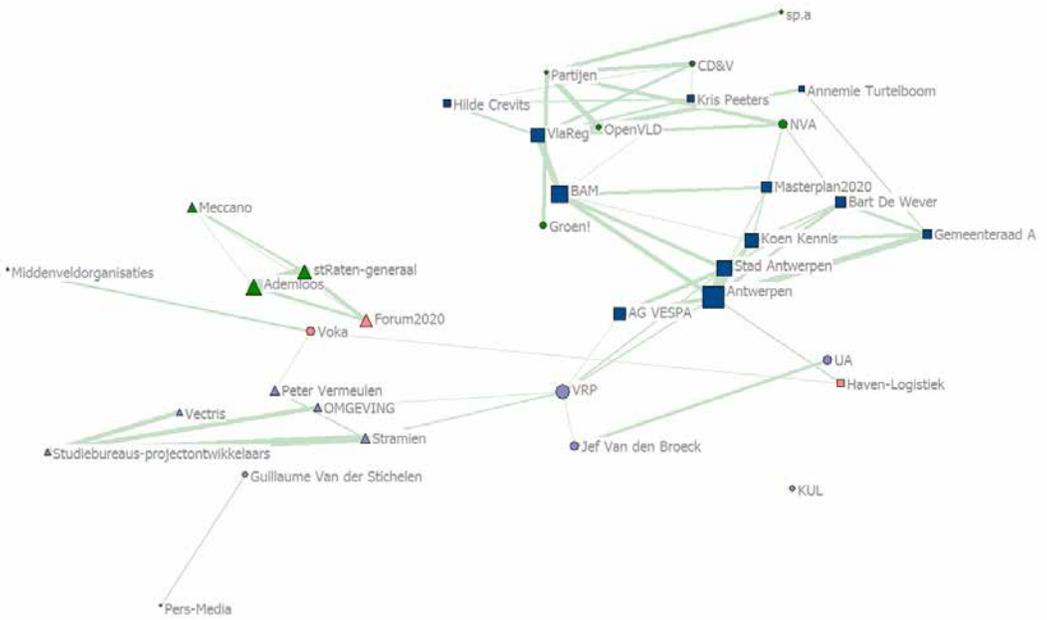


Figure 78 The actor network diagram of the upcoming Ringland initiative at the end of 2012.

Through research by design, the city of Antwerp had looked into the feasibility and impact of covering (parts) of the city road network. In November 2012, Ringland, a new civil movement in Antwerp stood up and launched the idea of capping the southern ring road. This was the dawn of a new era of civil opposition.

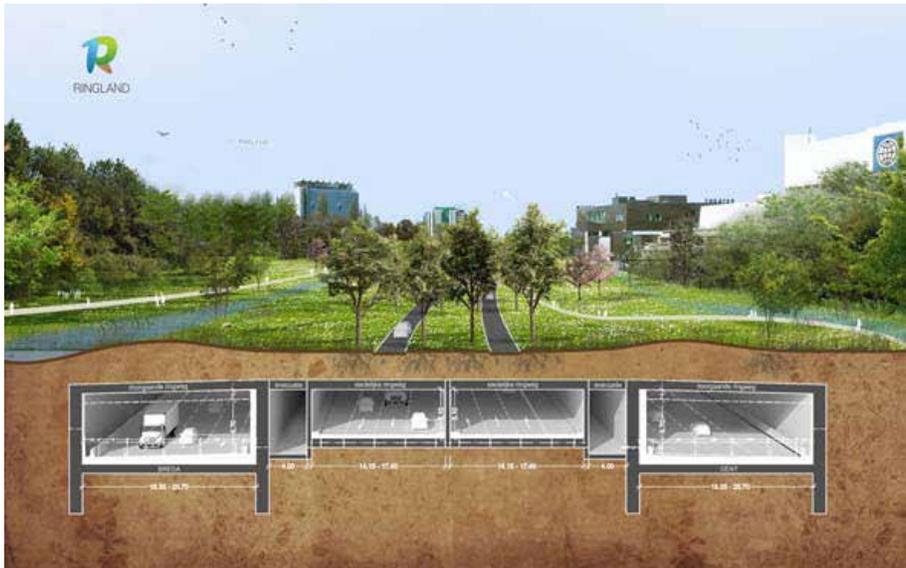


Figure 79 Ringland, the concept. Source: Ringland.

The Ringland concept came into being in response to a study by the city of Antwerp on the opportunities offered by capping the ring road (June 2012). Peter Vermeulen picked up the idea and engaged in redesigning and covering the ring road around

Antwerp (R2). This idea had earlier been put forward by stRaten-generaal and BorgerhouDt van Mensen (around 2000). However, the study concluded that the concept proved to be virtually impossible near the entrance and exit complexes of the current ring road; a complete reorganisation would be necessary. Peter Vermeulen, an engineer architect and partner at Stramien (a design office in architecture, urban planning, spatial planning, and design of public space) took up the challenge. The capping concept was given a new interpretation from a design perspective. With the document '*Uit de Ban van de Ring*', published at the end of 2012, Ringland first came out of the shadow. In November 2012, the concept was presented publicly for the first time (Ademloos 2012). But the attention to the launch of the concept was somewhat disappointing and got no more than local press. Nevertheless, the idea came to the attention of Cathy Berx, the provincial governor of Antwerp. She encouraged including the Ringland concept in the ongoing EIA procedures (plan-MER A102/R11bis) for the Oosterweel project. Accordingly, the Oosterweel debate was opened yet again; with its positive capping imaginary, Ringland had revitalised the debate. However, Ringland was only a concept and a collection of ideas at that time.

In 2013, on the very same day of the Valentine agreement, the Ringland initiative officially arose. Ringland proclaimed the capping of the ring to improve the liveability and health of the citizens, combined with a new concept for the ring road structure. This implementation alternative to the southern part of the ring road was partly inspired by the capped M30 in Madrid, and was suggested earlier by stRaten-generaal. Beyond problem solving, the *Ring-land* (the land on the ring road) was especially well-developed and presented as an opportunity for enhancing a qualitative and liveable urban development. By combining expertise and creativeness with mastering the contemporary communication channels to target the citizens, and by launching events, Ringland became a qualitative brand. By this, the Ringland movement distinguished itself from the other citizen movements in the story so far.

In three months' time, by the end of 2014, Ringland had collected over 100,000 euros by symbolically selling the land on the surface of the ring (4m² for 20 euros). Ringland spent this crowdfunding money on extra research: a mobility study, a cost benefit study and a liveability study (E.D.M. 2015). StRaten-generaal and Ademloos launched an online call to vote for Ringland and, thus, against the spatial implementation plan of Oosterweel (GRUP Oosterweel) (Ademloos, 2015). Embracing social media, finally, over 15.000 statements of objections were obtained. This gave the citizen movements the right to speak in the Flemish Parliament on July 2 (Belga 2015b).

When looking at the specific actor network developments as generated by the Ringland data, the actor networks show an interesting evolution. Whereas in the previous translation rounds, based on the BAM data, the diagrams showed a rather marginal position of the citizen movements, this changed with the upcoming and vibrant Ringland initiative. The actor networks of both chosen policy and opposition (by citizen movements) became tied to one another, and they were evenly matched.

7.2.4.2 Interestement of Ringland and the citizen movements

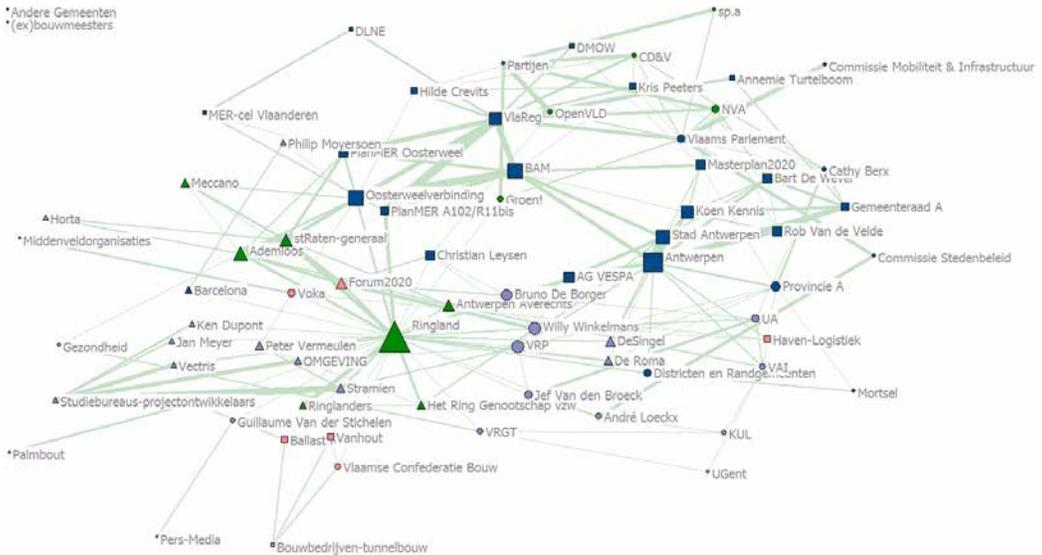


Figure 80 Reconstruction of the Ringland actor network in 2013.

This phase is very important for Ringland and the other citizen movements. Neither time nor effort were spared. Figure 78 to Figure 81 demonstrate the further development and central positioning of the Ringland initiative in the actor network. The civil niche actors not only tried to associate with experts but also with business actors and public regime actors. Though strengthening the ties with the local citizens was never overlooked.

First, the capping concept was elaborated within the urban planning and architecture office Stramien. Playing with sophisticated narratives and images of the capping concept (Figure 79), Peter Vermeulen, the leading urbanist of Stramien, and his Ringland entourage steadily gained ground. The civil support base reached even further than the city of Antwerp. Ademloos and stRaten-generaal joined the new spirit and collaborated with Ringland. The opposition to the BAM project gained a more positive public image.

7.2.4.3 Enrolment of the citizen movements

The Ringland team further developed the concept internally, within the office of Stramien. At the first Ringland colloquium in March 2014, the studies and concepts were presented to the public and not only commented, but also heavily supported by external experts who openly agreed with Ringland (cf. the purple actors in the centre of Figure 80): Bruno De Borger (University of Antwerp), Hans Bruyninckx (European Environmental Agency), Jef Van den Broeck and André Loecx (both from the Catholic University of Leuven). With a first crowdfunding campaign, at the end of 2014, the area on top of the ring road was symbolically sold to carry out additional studies on mobility, health, feasibility, and urban development. As a result, the

support base, which was now even partially financial in part, increased even further. The studies were carried out by the independent consultancies of Vectris, OMGEVING, Idea Consult, and Vito. Initially, they were quite sceptical about the assignment, but they faced the challenge. Fortunately for the citizen movements, the studies analysing the impact on mobility, health, the feasibility, and the financing of the project, showed promising results. The results were presented for a larger public at the Roma in Borgerhout (for their own people), and later on, in an expert colloquium in DeSingel. Those favourable results did not escape the popular press (Huysse 2015). A few months later, Ringland presented its studies in the Flemish Parliament and at the Antwerp municipal and district council. At the yearly Ringland Festival in June, the results were celebrated as well. The first edition in 2014 attracted 15,000 visitors, a year later they wrote 20,000 on their books, and in the meantime, the Ringland festival has become an annual phenomenon (Belga 2015a).

Through a fruitful collaboration with communication agencies, a formal non-profit association '*Het Ring Genootschap*' was established. Ringland adopted an organisational structure with various working groups to anticipate future challenges, develop a financial plan and address different target groups. The citizen movement became a strong brand with supportive, tailor-made campaigns. Ringland on Tour (October 2014), a trip through the districts, generated 20,000 euros. The online crowdfunding campaign generated a further 80,000 euros to carry out additional studies. Later, at the end of 2015 and the beginning of 2016, the 'Build with us' ('*Bouw mee*') campaign was launched. Under the slogan 'Ringland at Home', Ringland volunteers were invited to inform friends, acquaintances and family members about the concrete content and impact of the Ringland plans. They wanted to refocus on the local level again. The '*Bouw mee*' campaign also provided money, in the form of permanent transfers, to hire two permanent half-time employees for a further coordination and professionalisation of the Ringland organisation. In addition, the Ringland Academy was launched, comprising four working groups in which external experts examined the current plans and strategies and to fine-tune them (Brinckman, 2015). Within this framework, Ringland organised and financed the CurieuzeneuZEN project, together with the city of Antwerp, the Vrije Universiteit Brussel (VUB), KULeuven (KUL), and the University of Antwerp (UA). The residents of the Ring and academics appeared to be mobilised easily. In contrast, although Ringland could count on much political support behind the scenes, the willingness of politicians to openly change course turned out to be much smaller. But the actor network shows many cross-connections between individuals of the chosen policy camp and the Ringland network.

Ringland initially started a new, more positive story; the concepts they elaborated added value to the already existing infrastructure of the ring road. They did not yet position themselves in the third Scheldt crossing debate on route choices at first. But they could not postpone this positioning for a long time, as both the associated citizen movements and their civil support base wanted a clear answer. After a thorough investigation, they tended towards the route choice of the citizen movements, as they found their covering idea not compatible with the BAM-route (aro 2015). Consequently, the actor network included Meccano and the Oosterweel North route options.

As the Ringland actor network grew and increasingly became entangled with the subnetwork of the Oosterweel Link project, the hierarchisation of the initiative became opportune (see Figure 80 and Figure 81). With the Ringland Memorandum in 2014, Ringland forced the political parties to show their colours, pro or contra Ringland (Moolenaar 2014, Ringland 2014). Later, in mid-2015, Ringland collected enough petitions to obtain the right to speak in the Flemish Parliament, thanks to a joint effort of all citizen movements and their large civil support base. The Ringland studies were presented and followed with great interest. Later that day, for the occasion, the Antwerp city council and the district council were exceptionally united and Ringland got the opportunity to convince the city of its plans.

The studies were distributed among the administrations and the Cabinet of the Minister for Mobility. However, little enthusiasm came from that side; the 'chosen policy' continued along the trodden path in the meantime.

On Ringland's proposal, the mandate of the intendant was introduced, to streamline the various plans and tracks. However, the final, formal assignment of the intendant, as announced by the Flemish government and the BAM in early July, was much more limited; it only considered the capping of the ring road. Suddenly, the mobility story was omitted, as the route alternatives were no longer considered as points of the discussion; the chosen policy had opted for the Oosterweel route (BAM route).

Nevertheless, Ringland was cautiously hoping for a fruitful cooperation with the intendant, who could initially hardly deviate from the chosen policy path. While Ringland kept communicating openly to open up to decision-makers and to think constructively, the formal role of Ringland in the Oosterweel Link project remained vague and far from central.

The Ringland capping concept became included in the current EIA procedures (A102/R11bis). But, in the meantime, the chosen policy (BAM) track continued with the Oosterweel project (separate EIA Oosterweel). As the mandatory EIA developed separately, there was no guarantee that the Ringland concept (only considered in the second EIA) could be awaited; nor the ambition note of the intendant. So, back in 2016, the strategy or politics of a 'fait accompli' prevailed (Ringland, personal communication 10 April 2016). Ringland still engaged in this' enrolment phase, while it also invested in the problem-saturation and' interest' phases in order to continue and expand the broad support base; e.g. the Ringland Academy was established and started the *CurieuzeNeuzen* citizen science project.

7.2.4.4 Interestement of the chosen policy

In practice, the preparatory works had already started in the end of 2015 (B.B.R. 2015). As the opposition parties and many citizens supported Ringland, the government established an 'intendant' (an idea prompted by Ringland itself⁷⁵); this external person should harmonise the Ringland and the BAM project, bring all actors together and look for opportunities to pursue a maximal capping of the ring road within the project margins as negotiated with the BAM. For the latter

75 Sven Augusteyns (Ringland movement), personal communication, 9/06/2015

reason, opposition groups were sceptical and expected little room for manoeuvre for the intendant, thus little outcome. But at least the collaboration processes had re-started, which was considered an important first step.

7.2.4.5 Mobilisation of allies of the citizen movements

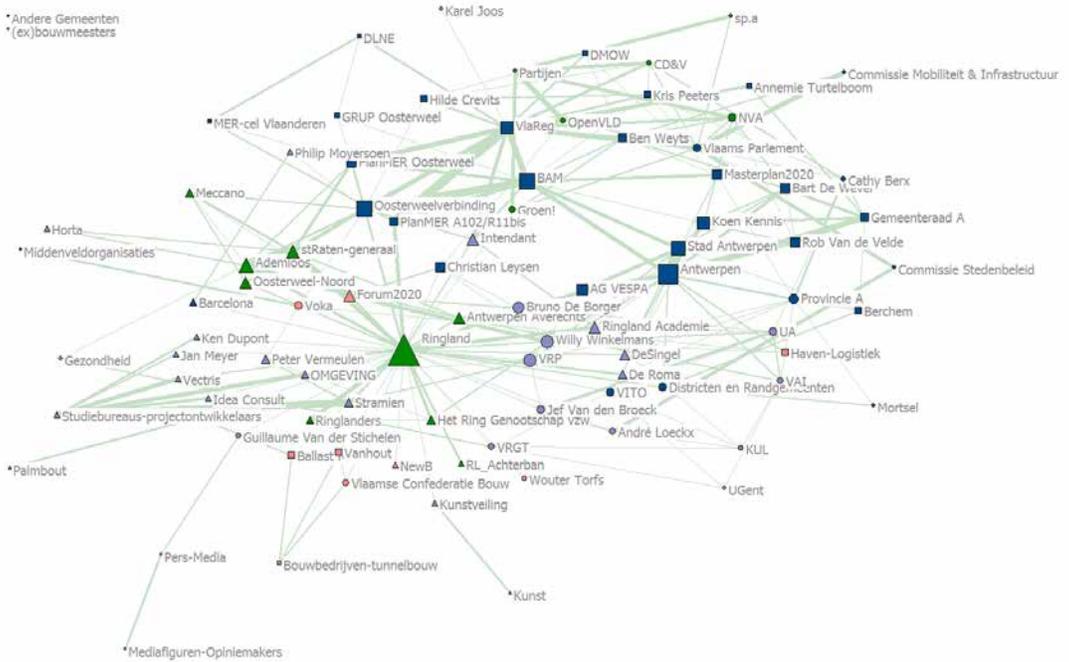


Figure 81 Reconstruction of the Ringland actor network in 2015.

During our close observation period of Ringland from the end of 2012 until the end of 2015, Ringland and the other citizen movements could only dream of actually becoming involved in the project process. The final episodes of the Oosterweel Link story, prove that the intendant could force a real breakthrough. He could bring the opposing actors around the table again to discuss and tie up the loose ends of the project (cf. second, third, and fourth translation round). The efforts in the super workshops even culminated in the Future Covenant (*Toekomstverbond*). This covenant, signed by the city of Antwerp, the Flemish government and the citizen movements, listed the ambitions and terms of a further collaboration regarding mobility in Antwerp. Although not during our close observation period, Ringland and the other citizen movements appeared to have reached the fourth stage of actor networking. But those negotiation rounds are far from over at the time of writing this dissertation.

The central position of the intendant in Figure 81 gives away the importance of his mandate in the project process. His node is situated in the centre and connects all subnetworks together. Public regime actors, civil niches, knowledge institutions and experts are collaborating in the super workshops organised by the intendant. His



Figure 83 Compromise proposed by intendant. Source: Brinckman (2017)

and supported by all stakeholders. Some found his mandate too limited, as the BAM and the Flemish government only commissioned investigating the capping options; leaving an inquiry of the mobility system underneath the capping out of the discussion. During his mandate, he gained the trust of all the stakeholders. The ‘safe’ atmosphere in which the super workshops took place to elaborate opportunities, collaborate, and discuss a compromise payed off. Soon, for the southern part, a political compromise was reached and supported by all stakeholders (city of Antwerp, the civil movements, the Flemish administration and the minister)..

For the northern part, the round of debates and private meetings lasted much longer. The stakes were high, because of the pending legal disputes, and as, in addition, the three civil movements had already collected enough signatures to enforce a second referendum in Antwerp, in case the government would not postpone submitting the building permit for the Oosterweel Link until after the intendant finished his work within the different workshops. In March 2015, the key actors signed the Future Covenant (Huyse 2016, Peeters and Wauters 2017, Van Ginneken 2016). However, the following months were dominated by heated discussions, putting the Future Covenant under pressure (Truyts 2017). The intendant and the major stakeholders intensively analysed and elaborated a new option – combining the BAM route proposal (Oosterweel Link but ‘light’ version) with that of the citizen movements (a capping of the whole ring road and completing the ring further north of the city, through the port of Antwerp) as illustrated in Figure 83 (Brinckman 2017). Though still remained the question on how ‘light’ the Oosterweel Light would become in practice, and how the capping of the ring road could be financed. In the meantime, all personal legal claims or thus obstacles were eliminated, after discussing the new alternative options (N.N. 2017).

7.2.5

Fifth translation round: how will the ring be covered?

7.2.5.1 Problematisation and interesement – the international capping contest

The ambition paper of the intendant and the Future Covenant between the city council, the Flemish government, and the citizen movements had already delivered a new obligatory passage point. Those papers had brought the actors together by promising, amongst other things, the capping of the ring road. In May 2017, parallel with the proceedings of the implementation of the Future Covenant, the capping of the Ring Road thus entered a new phase. The intendant launched a design contest in which six international interdisciplinary teams competed for covering a section of the ring road.

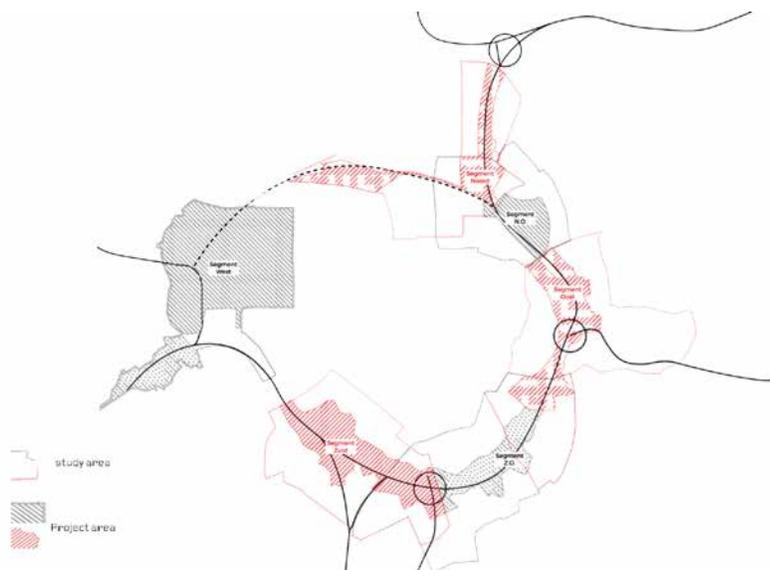


Figure 84 Six segments for capping the ring road. Source: D'Hooghe et al. (2016, pp. 116-117).

The obligatory passage point had been settled during the negotiation rounds with the intendant: the capping of the ring road would become a fact. The ambitions for the spatial interpretation and implementation of the capping had been elaborated by the team of the intendant in the Ambition Paper (D'Hooghe, Blondia et al. 2016) as well as negotiated and approved by all stakeholders (citizen movements, city of Antwerp, Flemish government). In the Ambition Paper, proposed financial investments were set out per segment, as listed in Table 6. Accordingly, the total costs for the ring road covered (including pilot projects, a larger initial phase and a finalisation phase) were estimated at approximately 9 billion euros. As no such project could be financed within the regional budget, the project was considered to be intergenerational; indeed, when staggered across several years and even legislations (e.g. 10 years), the budgetary deficit caused by such a project decreases thus making the operation more feasible.

7.2.5.2 Enrolment

How will the capping arise in practice? Therefore, the intendant launched a Capping Contest in the beginning of 2017. Earlier, in the super workshops three coalitions or cooperation processes characterised by different dynamics had already been initiated. These cooperation processes with the citizen movements, city and Flemish administrations are picked up by the design teams in the contest. A series of workshops with large-scale citizen participation was organised to develop a vision for the sections (*Ringdagen*). For each of the capping segments a one-day workshop was arranged and attracted many subscriptions. Citizens, citizen movements and interest groups wanted to represent their neighbourhood, make sure their claims were heard and their field knowledge exchanged. The scale of participation was unprecedented according to the local press (asry 2017); over those 6 days, 1566 participants formulated 3452 written suggestions and diverse claims. The most prominent were: creating the city (1671 suggestions), connecting (918) and breathing space (425).

| Segment | Design Teams | Investment (MEUR) | |
|--------------|---|---------------------------------------|--------------------|
| | | first phase (incl. pilot projects) | finishing phase |
| North* | B UUR, LATZ, S 333 and GREIS CH, in collaboration with Levuur, Tree Company, ProFlow, 3E, eld and Anno | 390 | |
| Northeast* | OR G in collaboration with ARUP, Common Ground and Deltares (a.k.a. the team of the intendant) | 330 | |
| East** | 5 1N4E, NDVR and H+N+S, in collaboration with Mobility In Chain, BOLLINGER+GROHMANN and Bagaar | 1,980 | 960 |
| Southeast | S tudio Paola Viganò, Grafton Architects and MAARCH, in collaboration with Sweco Belgium, Idea Consult, Antwerpen aan t woord, Sertius and D2S International | 1,420 | |
| South | A gence TER, TVK and ARCADIS in collaboration with Interboro/ Marleen Goethals, IBM, Deloitte and Crepain-Binst | 2,120 | 1,100 |
| West* | DE URBANISTEN, OMGEVING and COBE, in collaboration with NEY, SBE, D+A Consult, Yellow Window, Mint, ABO and Copenhagenize.eu | 180 | |
| Total | | 6,420 | 2,060 |
| | | | 8,480 |

Notes

* Segments included in Oosterweel Link project

** Segment partly included in Oosterweel Link project

Table 6 Segments, design teams and estimated costs for covering the Antwerp Ring Road.
Source: D'Hooghe et al. (2016: 133)

Following this intense introduction, in December, a second round of workshops was organised to give the design teams the opportunity to get even more practical input. Still two other feedback moments with the participants were/will be held in February and April; respectively to introduce the first designs to the citizens and get feedback, and to present the ultimate fine-tuned plans (Over de ring 2017).

7.2.5.3 Mobilisation of allies

Financially, the total cost of the Oosterweel Link infrastructure project has been rising from 600 million euros in the first years (only including the Oosterweel Link, thus the new part completing the ring road), to 4.5 billion euros more recently, including mitigating measures. But covering the whole ring road will cost 9 billion euros more (D'Hooghe, Blondia et al. 2016: 131-137, Moens and Van de Velden 2017). To finance these works, the city of Antwerp and the Port of Antwerp will provide 250 million euros. The Flemish government, in turn, has reserved 1 billion euros and plans to finance the project through a revolving fund (*rollend fonds*). Remaining financial resources from the department of mobility and public works will be transferred to that fund. As such, the government estimates raising the budget by approximately 100 million euros each year. In spite of this, the financial plan is certainly not waterproof yet and the solidity of the Future Covenant is questioned here and there. The current financial budget only 'covers' a first step of the whole ring road, though the initial ambition remains a complete cover (Wauters, 2017).

7.3

Case Epilogue – highlights of a roundtable discussion

Many mobility planning strategies, and LIP strategies in particular, still predominantly focus on the implementation or the input-output story of the project. Too often LIPs are handled within the sole field of infrastructure and public works, while the interests and implications are more far-reaching. Many other policy fields and plans are influenced by transport interventions (finance, economy, environment, spatial planning, labour, etc.). Hence, more stakeholders (government bodies, civil movements and other societal stakeholders) enter the planning scene, making alignment more difficult in the planning process.

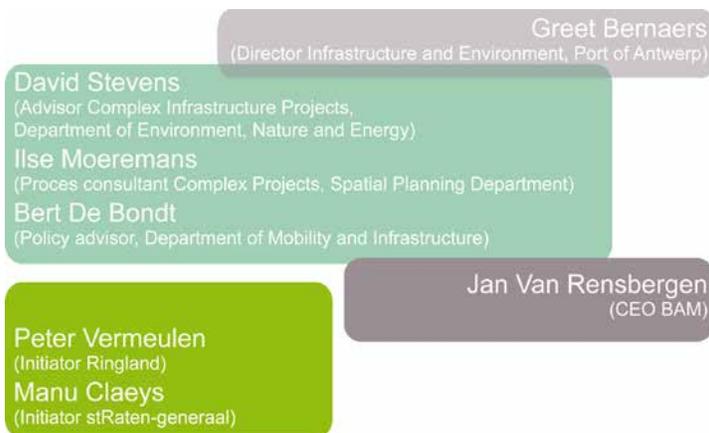


Figure 85 Participants in the roundtable discussion on the LIP Oosterweel Link.

What was the object of the Oosterweel Link project planning? More interestingly, could we persuade some of the more prominent actors in the Oosterweel Link project of the complexity of the case, and the implications for the planning object, or conditions? That it would require a more complex decision-making process? In order to respond to those questions and to investigate the planning conditions, we organised a roundtable discussion. The round table took place in May 2016, at Hof Van Liere (Antwerp University) from 16:00 till 18:30. For a collaborative atmosphere and a fruitful discussion, we limited the number of participants to seven, excluding the organising committee⁷⁶, and we aimed for a diverse range of actors engaged in the project (business, civil, or public). We, the organising committee (existing of the doctoral student writing this dissertation, and both supervisors), affiliated to Ghent University, completed the quadruple helix, as academics. After a doodle round, some actors were put aside⁷⁷. The participating actors are illustrated in Figure 85.

The participants were introduced to complexity thinking in the field of managing large infrastructure projects (LIPs). In the quest for a more sustainable mobility, present mobility planning approaches did not prove effective; in particular in the case of LIPs. Realising LIPs became increasingly difficult, resulting in many stranded projects (*i.a.* Uplace, Eurostadion, widening of the Schipdonk Canal, the Oosterweel Link, etc.). Previous LIP research has shown that reality could be more complex than expected. What makes those projects so complex then? Decision-makers often still focus merely on financial, technical, and legal issues of complexity (Flyvbjerg 2007, Priemus 2007). While the influence of social and organisational complexity is heavily underestimated with respect to planning processes and procedures, see Figure 86 and Figure 87. A mismatch could thus be identified between what the approach concentrated on, and what was experienced as most challenging by project managers (Hertogh and Westerveld 2010).

Figure 86 illustrates the relative importance of the different complexity aspects of the Oosterweel Link project over time, as expressed by members of the Commission of Mobility and Public Works (Flemish parliament), by the officials of the BAM, by activist groups (occasionally invited to this commission), by experts, etc. The figure is built based on parliamentary committee minutes reporting on the project progress. Those sources were coded in NVivo to allow further data processing and thematic analyses.

The six components of complexity and what they stand for are briefly described. The social component of complexity relates to the number and representation of the actors and the alignment of their (conflicting) demands. Also, communication and having a support base, political and societal, is part of the social component; as well as issues of a decision-making process that is still in the hands of vested planning actors favouring backroom politics. The organisational aspect of complexity is

76 The organisational committee consisted of my supervisors Prof. Dr. L. Boelens and Prof. D. Lauwers, both (very) familiar with the project and the protagonists of it, and me of course, as PhD researcher analysing the governance of the Oosterweel Link project.

77 The actors that were invited and showed interest to attend, but had to be excused due to conflicting agendas: **S. Betz**, Senior advisor spatial planning and environment at Voka (business actor); **K. Kennis**, Aldermen for Mobility and Public Works in Antwerp, and the head of his Cabinet, **B. Van Camp** (political actor); **C. Berx**, governor of the Antwerp province and former guardian of the support base of the governmental actors in the Oosterweel dossier (Poort Oost platform).



Figure 86 Attention paid to the various aspects of complexity in LIP Oosterweel Link.

closely connected to the social component, but focuses specifically on: (power) relations between the stakeholders, responsibilities, appropriate scale levels, organisational needs for implementing the project, etc. The financial aspects include everything relating to the total cost of the project, the risks that are related to the project and construction over time, and the financing itself. Legal aspects cover the juridical claims made by stakeholders, but also include the European guidelines for tunnels and transport infrastructure, etc. The time aspects contain everything referring to time, and risk management with regard to time, the project phases, the delay and start of the infrastructure works, etc. Finally, the technical aspects refer to the technical details, the extra studies that have to be conducted, the design, construction details and risks, the route options, the search for alternatives to decrease the impact, etc.

The scheme shows that social complexity is a major part of the discussion in 2005 (42%), 2008 (32%), in 2010 (32%), in 2011 and 2012 (resp. 29% and 25%), and in 2016 (25%). It is no coincidence that those are also the years in which opposition stirred the debate or when their alternatives sparked the discussion on route options again. The figure, however, also demonstrates that a substantial part of the discussion is still attributed to the technical aspects. In the years following the boom of the social aspects, striving for better alternatives, the technical discussions dominated the debate again; for instance, in 2009, the technical aspects ruled the debate (38%). In 2013, when Ringland proposed the 'capping of the ring road', the technical aspects took a share of 33% and held that level during the following years.

The financial and legal aspects account for a significant part of the discussion as well, as could be expected from the scientific and general literature and press coverage on large infrastructure projects. However, they are not the sole aspects dominating the parliamentary discussions. The organisational part only took a

prominent share in 2007 (31%) when the consortia had to be selected and a support base had to be built, and in 2016 (21%) known as the year of the intendant and the beginning of a new era of cooperation and super workshops.

By zooming out and taking a general look at the project, the resulting relative importance of all complexity aspects is slightly different (Figure 87). The average image of the Oosterweel link, shows that the technical aspects still outperform the social complexity. The financial complexity ranks third in the top three. So, for several years, the general conclusions of Hertogh & Westerveld, referring to the substantial part of social and organisational aspects, can be confirmed; but this conclusion does not apply when considering the overall image of the Oosterweel Link. In the figure, the LIP research average from Hertogh and Westerveld (2010) is set out against the average of each component in the Oosterweel Link project. As shown by the red bars, the differences are largest for the social aspects and organisational aspects (much less given attention), and for the legal aspects (much more highlighted in Oosterweel Link project).

It is important, however, to note that we were not able to interview the project managers of the BAM themselves. So, we based our data and occurring themes on the progress presentations of the BAM, and the discussions afterwards, as reported and published in the parliamentary committee minutes.

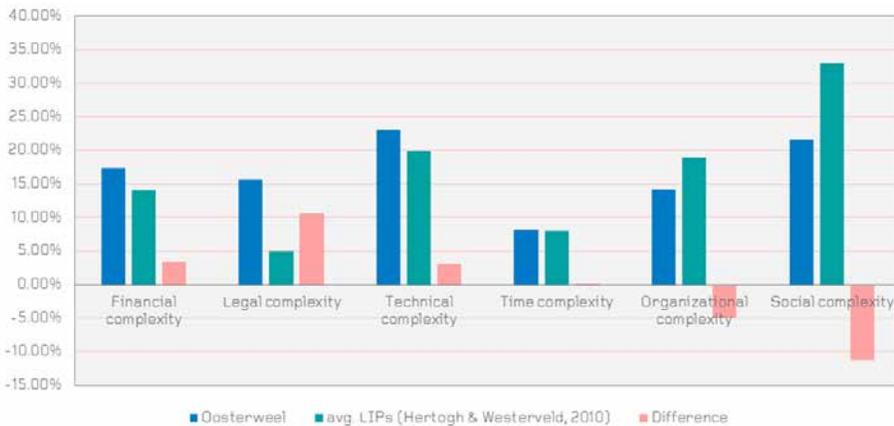


Figure 87 Attention to the various aspects of complexity in LIPs in the case Oosterweel Link, the LIP research of Hertogh & Westerveld, and the difference. Source: own elaboration, partly based on Hertogh and Westerveld (2010).

BOX

Total costs of the project – what is all the fuzz about?

Although we are not planning to make the same ‘mistake’ again here, we will not deny you a closer rough financial inspection. It received substantial attention, after all. Figure 88 show the rise of the project’s total cost over the years. In the first years, constructing the project was estimated to cost almost 600 million euros. But soon, the costs almost doubled alarming the Flemish Parliament that instructed the Court of Audit to follow up on the project. A price cap of 1,850 million euros was established by the Flemish government, but that did not stop the project cost from increasing. In the following years, the project’s total cost had risen till 3.2 billion euros. The passage of the intendant and the Future Covenant, and the ambitions (Port Route alternative and a complete cover of the ring road) caused the price tag to further escalate. Covering the ring road is estimated to cost an additional 9 billion euros, while the port route alternative is thought to be 1 billion more expensive than the previous route. The total bill has thus been added up to 13.500 billion euros.



Figure 88 The total cost of the Oosterweel Link project over the years, including the Port Route alternative and the total covering of the Ring Road.

The fact that until now – in LIPs – a major focus is still given to financial costs and technical aspects (Flyvbjerg 2007, Priemus 2007), points towards the still prevailing technocratic planning approach; towards the notion of the (mobility or transport) planner as engineer. This planning perspective used to pay off, but more recently, other mobility planning approaches have been sought for as ‘complexity strikes back if it is neglected’ (Salet, Bertolini, and Giezen 2013: 1989). Hence, the central questions for our round table discussion are: (1) ‘What can such new complexity embracing mobility planning approach add to LIP planning processes?’, and (2) ‘What does this mean for the actors and the conditions?’

After a brief introduction to the complexity theories in LIPs, we confronted the roundtable participants with the whole project history again, as presented in Figure 89. Just like we guided you through the project in the previous sections. The challenge was to bring the key-stakeholders in the process together. We wanted to collect their perceptions of the encountered complex actor setting and conditions. A second question then was whether they could sympathise with each other's perspectives and decisions at several crucial moments in the project process. More specifically, we wanted to concretise how the conditions or the setting changed for decision-making; or whether there were some windows of opportunity.

To cope with the encountered complexity, we focused on the matrix of governance approaches (cf. Figure 10 and Figure 11). For the Oosterweel Link we suggested a co-evolutionary approach, as both actors and conditions were dynamic. This co-evolutionary approach incorporated elements of the 'dynamic management' strategy as proposed by (Hertogh and Westerveld 2010). Their approach would allow a certain flexibility, and simultaneously, the urgency to act could also be responded to. The various participants agreed on the merits of such co-evolutionary approach. When asked about their perception of co-evolution regarding the LIP process, they ended up identifying 'click'-moments; moments that were decisive for the rest of the process. But according to the civil movements, some of these click-moments (moments of control in the dynamic management approach) were ambiguous, as they did not actually 'click' or secure certain decisions, but remained open for alternative options. Those click-moments can be considered as windows of opportunity in the actor's governance trajectories.

As a first click-moment, all participants identified the presentation of the Arup/Sum alternatives study as a moment for seeking potential prospects and leads. The alternatives were assessed and compared based on various criteria, but none of the proposed route variants stood out. Therefore, ARUP/SUM proposed to conduct a follow-up study, elaborating on a variant that would outperform the others. The Flemish government then made a 'fatal mistake' by turning this window of opportunity into an 'ambiguous click-moment' according to some of the roundtable participants; Arup/Sum could carry out further research (i.e. a non-click), while the BAM was commissioned to prepare the building permission (i.e. a click). Some argued that the government should have taken a break and set the Oosterweel Link procedures 'on hold'. Conversely, by taking their decision, trust was compromised and polarisation increased. Everyone agreed that a pause was not sufficient; that one should have switched to a co-creative or collaborative approach already back then.

According to the civil movements, a second click-moment was the decision of the Flemish government in 2011 to assess all alternatives in a final environmental impact assessment once again. At that moment, the civil movements cherished hopes that their suggestions would be taken into account seriously. However, after a while this feeling of trust dropped due to a lack of sustained communication; but that is – according to the administration – inherent to the formal procedures. Also, the transparency with which the alternative options were adopted and modelled in the assessment was criticised. Not all alternatives were taken into account on the same grounds. This had prompted the civil movements to file a legal complaint, their last hope.

For some roundtable participants, the exact click might have happened earlier: when the Flemish government decided on the 'optimised medium-route' (the later BAM route), already in round one. Some argue that once the political choice is made, one should respect that decision and cannot call that into question repeatedly. Otherwise, the project stagnates and opposition increases. But not all participants agree, as they argue that the process was not transparent enough and not well-communicated. Furthermore, there was no participation at all, and thus, no broad support base as the project was steered internally. Besides, on various moments, unfair treatment of alternatives or decisions made with conflicts of interest, rendered these decisions unstable. Furthermore, the enduring protest against the project has broadened the project scope: quality of life aspects, a redesign of the mobility system, the aspect of air quality and the concept of capping, etc. were initially not on the agenda.

The civil movements argue that it is only logical that the process should be redone, since the project scope has more than doubled. But the participants representing the administrations replied that the question is rather 'how long can the government as client last without a solution?' They point out the risks of taking more than can actually be handled, of overcharging the project. Because that would result in the project's failure. They are in favour of not questioning previous decisions. There is

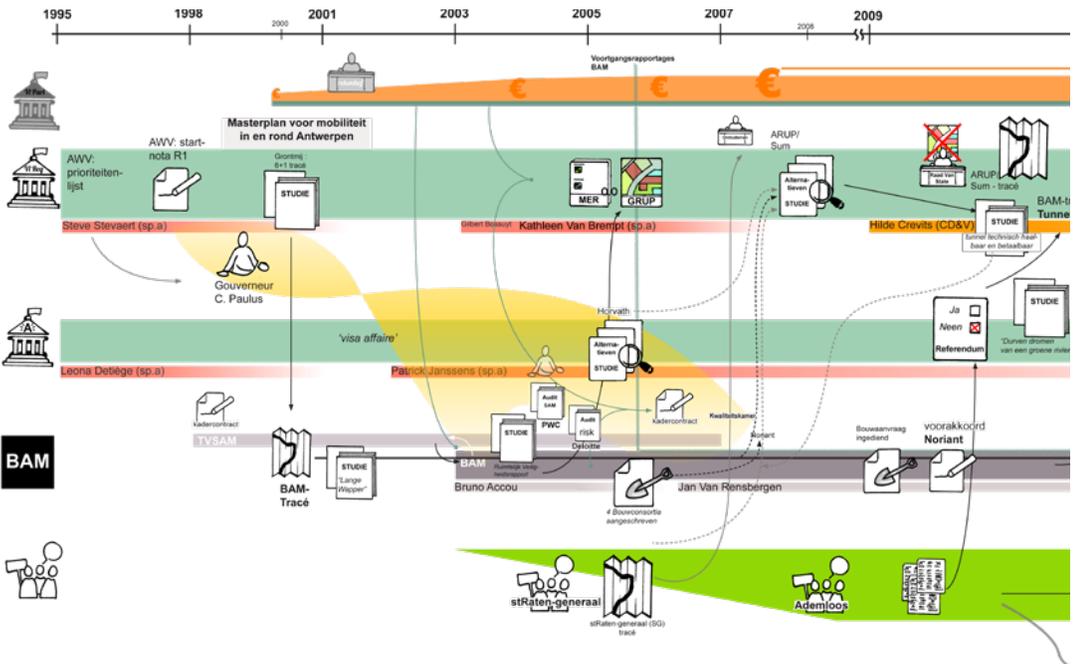
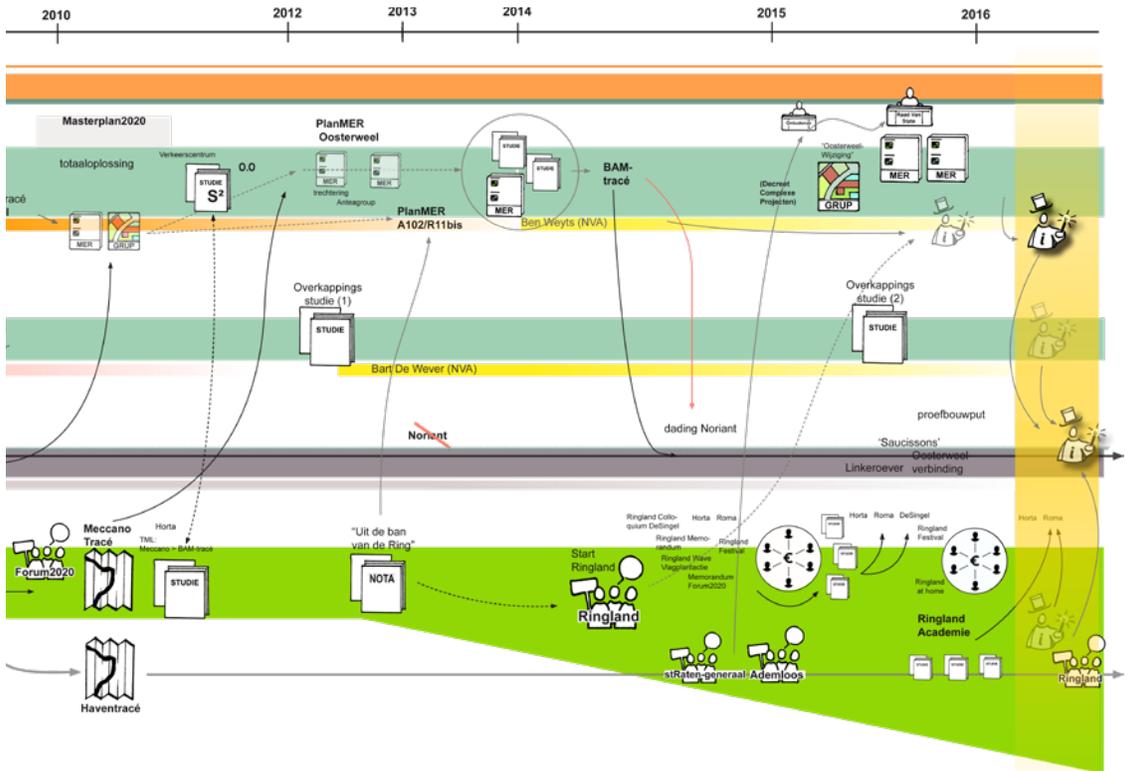


Figure 89 The Oosterweel project and the various underlying tracks, events, actions and interactions.

no lacking sense of urgency, but according to some, although the problem is clear, the problem solution(s) and precise objectives are not (!) and are still debated. Is a third crossing of the river Scheldt actually necessary? Will that solve the problem? Even that is questioned, so, how can we decide already?

A final indicated click-moment is the decision of the Flemish government to definitively choose for the BAM route. However, for all roundtable participants, this felt as an ambiguous click as well, since the government had just appointed an intendant (an idea that was prompted by Ringland. The intendant had to align all actors and build a broad support base for the capping (cf. idea of civil movements) of the entire ring road. At the time of the roundtable discussion, most participants had just started an intensive cooperation process guided by this intendant. The mandate of this man was too limited according to the civil movements and most of the experts in the debate. Shouldn't this also be a moment for a break, to alleviate the ongoing processes of the intendant?

The participants argued that the key for working with complexity is to release the process and to shift focus from output- or implementation-oriented towards process-oriented or co-creation. They identified click-moments where co-evolution flourished or got stuck. Furthermore, they agreed on the necessity of a more



integrated governance, implying a less fragmented government. A balance of interaction and control should be strived from the beginning onwards; decisions or ‘clicks’ should be made when broadly supported. The importance of a mediator or intendant was acknowledged in this case to balance between interaction and control.

7.4

Summarising the changing setting

The general decision-making setting at the start of the project cannot be compared to the setting during the later stages, in which opposition grew. During the first years, the city of Antwerp only had a weak position, due to the visa scandal that compromised the legitimacy of the Antwerp city council at that time. The Flemish government and administrations took the lead in the project. Citizen movements had only just risen, and were particularly engaged in/opposed to smaller public domain projects at city or district level⁷⁸. Accordingly, the government could rush the problem definition phase. Soon arose the solution of building a third⁷⁹ river Scheldt crossing. The study work was carried out by TV SAM, that collaborated closely with the BAM. Soon the project was all about route choices. But, as they shielded their planning and design process, they signed up for a rising opposition. Not only the role division between BAM and TVSAM was questioned, but also the study costs, and the non-transparent and non-communicative style of working.

From the moment the model was shown in 2005, the opposition increased. The empowerment of the citizens had been launched. They accused the BAM and the government of non-transparent planning strategies and a lack of (civil) support base for their decisions. Also, the city was triggered to play a more active role. The results of the Horvat study however countered the first round of opposition (2nd translation round).

A second round of opposition (3rd translation round) included health in the already very booked agenda of the project. The citizen movements made use of the upcoming environmental health arguments and the associated body of scientific evidence, for instance, with respect to the impact of high particulate matter concentrations. They rapidly learned how to anchor their (op)position against the project. Through the ever-growing media possibilities, the citizen movements gathered enough petitions to claim a referendum, allowing the Antwerp citizen to become engaged and express his opinion about the project (tunnel or viaduct)⁸⁰. The citizens chose a tunnel instead of a viaduct.

78 stRaten-generaal, for instance, came into being in 1999 as a reaction to the harvesting of the Japanese cherry trees bordering the Museum square (Museumplein) in Antwerp. There was a great deal of protest against the removal when, in the hollow of the night, those trees were taken away.

79 It would be the third river crossing when only considering the primary road network.

80 The city of Antwerp had to give its advice regarding the Oosterweel Link project. However, the city council could only ask for an opinion in the referendum about the implementation (tunnel or bridge) of the project. Legally, another route could not be included in the question, because that was not part of the project. Nevertheless, this referendum gave a vote to the Antwerp citizen and it was important first step for the citizen movements.

The citizen movements began to organise themselves more professionally. As they gathered knowledge themselves, they could no longer simply be side-lined by any study. Moreover, they felt supported by an ever-increasing group of academics who spoke out against the Oosterweel project. To get things right, the Flemish government conducted a new study of alternatives, carried out by international external experts. But the conclusions of that study were not as was expected: the BAM route did not outperform the other variants. In fact, no alternative did. But, in the meantime, the BAM was told to continue the project, while a new route alternative was elaborated and fine-tuned (Arup/Sum route).

A third round of 'opposition' followed (fourth translation round), led by Ringland, a citizen movement that somewhat differed from the others. One could not really speak of opposition, as that connotation is too negative for a citizen movement eager to collaborate and negotiate, and bringing a positive new story. They advocated a 'capping' or covering of the ring road. Ringland did not engage in a conflict model, but openly invited experts, businessmen, and politicians to discuss their ideas. Initially, Ringland did not position itself with respect to the Oosterweel Link project and the necessity of a third Scheldt crossing. But after a while, Ringland could not avoid that discussion anymore, all the more because of its alliance with other citizen movements that clearly had chosen their path (Arup/Sum route – later Meccano route).

In the meantime, the widespread introduction and use of social media had enabled Ringland to build a broad support base. That support base kept growing as Ringland continuously reinvented itself, keeping the debate alive with extra study material. Ringland almost became a professional organisation, with two paid, part-time communication employees, and many actively engaged volunteers from the various Antwerp districts. The movement always kept a strong connection with its civil support base. In addition, Ringland tried to reach out to politicians (e.g. the Ringland Memorandum) and to experts with the colloquia. The citizen movement even prompted the idea of appointing an intendant to get the project back on track. As such, they wanted to broaden the conditions for planning; the capping idea was planted into the regime. Ultimately a Ringland academy was set up, populated by many volunteer academics and experts from various disciplines. Ringland invested in three pillars: (1) in their civil support base of mainly Antwerp citizens, (2) in accumulating expertise, and (3) in influencing the policy agenda and even decision-making process. Some academics in Flanders dare say that such citizen movements in fact performed the different roles that had been neglected by the government. Such actors mark the project process and cannot be ignored (Vandaele and De Rynck 2016, De Rynck 2017).

While, in previous rounds, the governmental solution was sought in a new study of alternatives, they decided differently this time. They acknowledged the importance of the opposition and their added value for the Oosterweel Link project. Therefore, as proposed by Ringland, the government appointed an intendant; he had to analyse the options of covering the ring road and the feasibility of combining that with the Oosterweel Link project (3rd Scheldt crossing). Most importantly, though, he had to narrow the gap between all parties in the project. Accordingly, the external expertise

to level the playing field came from an intendant who gathered an (inter-) nationally praised team of academics and consultants around him. He started a co-creative process, as he had done, in the Rebuild by Design project to find a supported compromise to cover the ring road.

Many argued that the initial mandate of the intendant was too limited. As it only included investigating the opportunities and partnerships for covering the ring road to reduce negative health impact by traffic. The reorganisation of the transport system underneath that cover was out of the question, to the displeasure of the citizen movements. However, the intendant's super workshops payed off. An ambition was reached for covering the ring. After several additional months of collaboration and negotiations, the discussion opened up to the point where previous opposition rounds had stranded. The intendant tied up the loose ends of health, quality of life, and eventually the route choice. Although initially resisted by the governmental actors, the intendant eventually, and under the pressure of the citizen movements, reached the loose ends of the project: the route debate was reopened and the mobility layer was added to his mandate. A momentum or window of opportunity was created.

Not only the government, but also the citizen movements got acquainted with the rules of the game and its game-style. The citizen movements wanted guarantees from the government and threatened to give rise to a new referendum⁸¹, and to ultimately lodge a complaint at the Council of State (*Raad Van State*). As such, those pending legal threats were omnipresent in the debate as they were used as a big stick; they could blow up the project for at least many years (or even permanently).

We could speculate about the reasons why the intendant initially took up the job. But probably, if he had proposed to widen the mandate from the beginning on, to investigate both the reorganisation of the transport system (and route choice), and the capping of the ring road, he had not convinced the government. In contrast, he took a step at the time, and eventually ended up with a Future Covenant, an agreement that deals with much more than 'just' the Oosterweel Link project. It included ambitions about a Masterplan for Antwerp (Routeplan 2030), a radical modal shift, an Oosterweel Link light infrastructure connection, a port route, a covering of the ring road, and managing the impact of the construction sites and ongoing infrastructure works. In the end, the citizen movement withdrew from further judicial steps, because they at least saw some opportunities and guarantees for the future mobility decision-making.

The working community (*Werkgemeenschap*) and the super workshops, that had been set up to allow for a collaborative approach with various stakeholders (business, civil, public actors, and experts), have more recently been adopted by the transport region Antwerp (see Chapter 5, BOX transport region Antwerp).

81 For which they had gathered enough valid signed petitions.

7.5

Results and discussion

During the course of the large infrastructure project, the orgware changed drastically, thanks to the interplay of a diverse mix of actors. The governance ranged from a strongly top-down oriented technocratic planning approach, to a collaborative approach, and even towards the inclusion of a cautious co-evolutionary layer. The various mobility subsystems became structurally coupled and the institutional setting was altered to facilitate this.

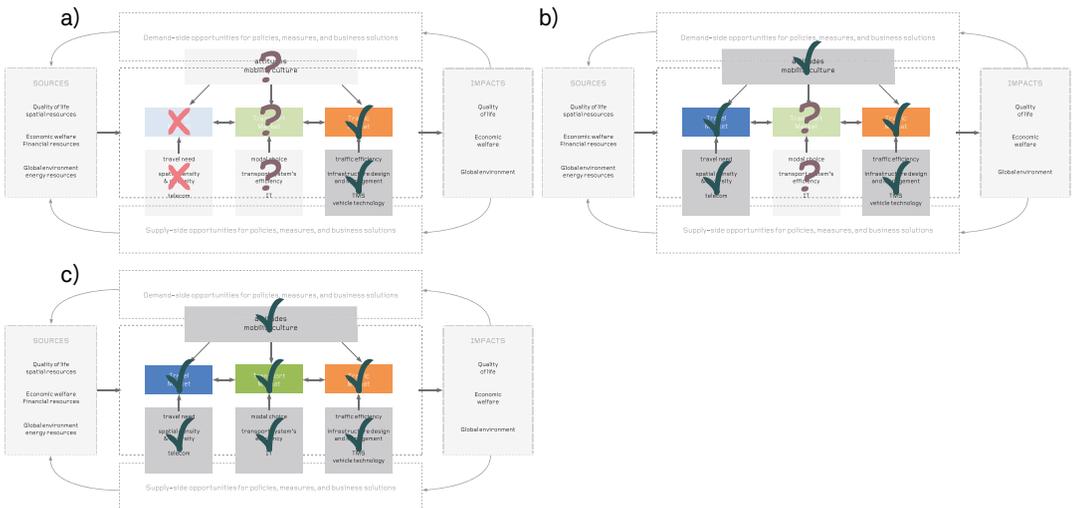


Figure 90 Overview of the LIP Osterweel Link orgware: a) during the first phases (BAM), b) as proposed by citizen movements, and c) as after the passage of the intendant.

The Oosterweel Link orgware – Structurally coupling the actors?

From the general overview of the actor network diagrams we can conclude that the actor network started within the public sphere. In particular the Flemish planning administration, the Roads and Traffic Agency, and the governor of the Antwerp province took the lead. By establishing the management company BAM, they shielded the planning in a technocratic circuit even further; but they became isolated from the process themselves (cf. marginal position of the administrations, except for AWV). In 1999, civic activists opposed this kind of ‘bureaucratic infrastructure planning’ for the first time. Since then, not only the subnetwork of the BAM grew further, but also the activists’ subnetwork rose steadily. Since 2008, after a professor of spatial planning of Ghent University exposed the controversy in the media by calling it a ‘medieval project’ (B.V.B., 2008) a growing number of research institutions and universities joined the debate. The opposition’s subnetwork was boosted with the Ringland initiative in the end of 2012, giving birth to numerous interactions between civic, public, business and academic sectors in the debate; and resulting in an overall complex image of the project’s actor network.

Since the start of the LIP planning process in 1995, several opposition groups from various backgrounds have joined the scene. They have evolved from marginal to more central in the project debate. Proclaiming health and liveability aspects, they increasingly gained the interest of the Antwerp citizens. The actor network diagrams show that during the years, the subnetworks of BAM and Ringland have become evenly matched. With an active presence on social media and events, Ringland's support base is still growing; not only within the realm of the Antwerp inhabitants, but subsequently also the political arena and that of consultancies. The evolution of the Oosterweel Link actor network therefore shows an increasing number of actors and connections over time in various directions. Hence, the actor network of the project encounters an accumulating complexity that called for different governance strategies; indeed with the present planning strategy the solution to one problem exposes other controversies, which in turn generate even other problems, etc.

Having observed and examined the Oosterweel Link discourse and storyline, based on parliamentary meeting minutes, interviews, social media, and written press, it could be concluded that the 'wickedness' was linked to a predominant bureaucratic governmental input of the project. The path dependent governance strategy prevailed, at the expense of more complexity-embracing strategies, and a co-evolutionary CAS governance. Rather than an open and dynamic planning process for developing a shared vision on the problem, opportunities and solutions, the process became locked-in and goal-dependent (cf. soon infrastructural solution of the 3rd river crossing). The usual suspects of governmental planning held the planning responsibility, the problem definition and apparent solutions, trying to 'represent' the other (niche) actors within the process; ignoring the level of complexity and omitting the interdependencies of the project in its context. However, with the entrance of Ringland the course of the project changed.

Adapting the conditions

Prompted by Ringland, the governmental answer to the unavoidable wickedness of the LIP process comprised the appointment of an intendant; an external expert that had to demine the debate and gather all actors and their sub-actor networks in the story together. His initial mandate was to manoeuvre and enforce structural couplings in the quest for capping the ring road. In the actor network diagrams, he is situated right between the governmental side and the opposition's actor network. Consequently, as illustrated in the diagram, he became the key figure in the further course of the LIP. The intendant adopted a collaborative research by design strategy, to get the ring road capped. That he is a spatial planner engaging in research by design gave him the tools to bring the citizen movements together, but also to get support from the "ordinary" citizens.

But, only a few months later, when under pressure of the citizen movements the mandate of the intendant was extended from only looking into the capping towards reconsidering the whole project setting (route choice, quality of life, implementation, etc.), the actors became aligned; the citizen movements wanted guarantees that the project would account for environmental health, environmental, and quality of life aspects. As such, we can in fact conclude that the governance approach eventually ended up to be co-evolutionary, as the institutional setting (and the environment to plan for) and the actor field became intertwined and mutually

influenced each other. The structural couplings for the alignment of the actors were consolidated in the Future Covenant, and in the working community that would roll out the projects that were anchored in the Future Covenant.

The role that Ringland fulfilled in the Oosterweel Link story can be called unique. The movement successfully combined different roles throughout the process. First, and foremost, Ringland was (and still is) a citizen movement, by and for citizens; the link with the support base had always been maintained. Second, they succeeded in getting their spatial planning, mobility, and health ambitions on the policy agenda. They had formed the basis of the new coproduction atmosphere that was adopted and navigated by the intendant. Eventually, together with the other citizen movements, effective policy adoption was pressed for, as confirmed in the Future Covenant. Furthermore, the citizen movements got themselves involved in the further decision-making and implementation of the Future Covenant and mobility governance process (cf. working community). Third, they invested in specific knowledge, necessary to further develop their concepts and their actor network. Financially supported by crowdfunding money, the Ringland movement re-invented and positioned itself by having many studies carried out by scientific institutions and experts. By starting a Ringland Academy, the movement associated and engaged experts and academics on a voluntary basis around the central values of health, qualitative spatial development, and safe and sustainable mobility. The citizen science project initiated by the Ringland Academy involved over 1,800 citizens in measuring the ambient air pollution in their street (further details in the next chapter). As such, Ringland not only mobilised allies to get their ideas implemented, but the movement built its support base from the bottom-up, and by investing in the environmental democracy, through for instance citizen science, they also provided their associative democracy.

When looking at the layout of the mobility CAS in the LIP Oosterweel Link, we can see that it started from the traffic market, the infrastructural Oosterweel Link project and route were soon formulated (Figure 90a). Gradually opposition came from actors that were rather situated in the travel market, they were questioning the quality of life and the impact on the urban structure of such project. Ringland somehow bridged the gap between that travel and traffic market, as their Ringland proposal addressed not only the liveability in the city (cf. capping concept), but also the problematic mobility system of the ring road (traffic market) (cf. Figure 90b). Thanks to the intendant the actors became aligned and the mandate of the intendant became broadened, so that the whole mobility CAS was comprised. Even the transport market was incorporated, as in the Future Covenant also objectives and measures were incorporated to reach a modal shift (Figure 90c).



A next step? – inspiration from the 'CurieuzeNeuzen' citizen science project



This chapter has been previously published as:
Suzanne Van Brussel & Huib Huyse (2018) Citizen science on speed? Realising
the triple objective of scientific rigour, policy influence and deep citizen
engagement in a large-scale citizen science project on ambient air quality in
Antwerp, *Journal of Environmental Planning and Management*,
DOI: 10.1080/09640568.2018.1428183

In the actor networks of Ringland, displayed in the previous section, the Ringland Academy took an interesting position; the academy bridged the gap between several less connected sub-networks. Furthermore, the Academy gave Ringland the objective means to position itself even stronger in the mobility debate of the Oosterweel Link project. With respect to our two-tiers framework we could state that the Ringland Academy did not only manoeuvre certain structural couplings, it also could get its project institutionalised. The Academy has moved beyond the plan. They address the ordinary citizen with their “*CurieuzeNeuzen*” citizen science project, measuring the ambient air quality in the city of Antwerp, we want to discuss it in more detail in this chapter. The origins and outline of the project are described, and how the project could manage a repositioning of the debate. The project focused in particular on traffic-related emissions, as traffic congestion is among the main contributors to local air quality variability in Antwerp. This part’s focus lies on the (social) dynamics that resulted from the *CurieuzeNeuzen* project. Parts of this chapter are published in a peer-reviewed article under the title “Citizen science on speed? Realising the triple objective of scientific rigour, policy influence and deep citizen engagement in a large-scale citizen science project on ambient air quality in Antwerp” (Van Brussel and Huyse 2018).

Daily traffic volumes deteriorate air quality in and around cities, and call for an urgent mobility transition. As mentioned before, many scholars argue that technological innovations alone will not suffice to reach sustainability goals (e.g. Anable, Brand et al. 2012, Banister 2008, Chapman 2007). Thus, an actual change in the behavioural response of citizens is necessary, whereby insights in how individuals are influenced by collective customs are imperative (Schwanen, Banister, and Anable 2012, Hull 2008, Urry 2004). A possible way for evoking behavioural changes is to invest in social capital, i.e. “the features of social organization such as networks, norms and social trust that facilitate co-ordination and co-operation for mutual benefits” (Putnam 1995: 67). In the environmental realm, this connection is also found: social capital is seen as a primary facilitator of civic action, e.g. behavioural change to reduce one’s impact on the environment (Wakefield, Elliott et al. 2001, Conrad and Hilchey 2011). Building social capital for sustainable development requires not only collective action by groups of citizens, but also participatory policy-making as argued by several scholars (Gerometta, Haussermann, and Longo 2005, Seyfang and Haxeltine 2012, Moulaert, Martinelli et al. 2005, Wakefield, Elliott et al. 2001, Agyeman and Angus 2003). Since the 1990s, one observes a ‘mushrooming of high quality and innovative community development initiatives in European cities’ (Moulaert, Martinelli et al. 2005: 1970), many initiated as a response to the prevailing technocratic approaches amongst others in the field of mobility and spatial planning. Several grass roots initiatives working towards more sustainable cities have looked at citizen science to support their goals and agendas. Aside from influencing local policies, citizen science projects could be a stepping stone to build the required knowledge base, trigger behavioural change and strengthen at the same time the social capital through the actual involvement of the stakeholders and the broader public (Muro and Jeffrey 2008, Newman, Graham et al. 2011). In this way, citizen science projects can potentially catalyse transitions towards sustainability at the local level (Theunis, Peters, and Elen 2017, Whitelaw, Vaughan et al. 2003).

8.1

Citizen science

Although citizen science has already a long tradition (Silvertown 2009, Conrad and Hilchey 2011), especially with respect to the contribution of amateur scientists in the fields of birding (Sullivan, Wood et al. 2009), history, and astronomy (Raddick, Bracey et al. 2010), the concept “Citizen science” has only been included in the Oxford dictionary in 2014. It is nowadays described as “the collection and analysis of data relating to the natural world by members of the general public, typically as part of a collaborative project with professional scientist” (Oxford English Dictionary, 2016). Recently, citizen science has increasingly gained legitimacy as a scientific discipline with respect to both decision making and “mainstream science” (Storksdieck, Schirk et al. 2016, Freitag, Meyer, and Whiteman 2016). As the benefits of citizen participation in science projects and the accumulation of experience in citizen science outweigh the limitations, citizen science programmes are starting to push the limits of the citizen science tradition further and further (Tregidgo, West, and Ashmore 2013, Conrad and Daoust 2008). Particularly in ecology and environmental sciences involving citizens is booming (Conrad and Hilchey 2011, Dickinson, Zuckerberg, and Bonter 2010). Large-scale environmental science even necessitates citizen science (Silvertown 2009: 467) since obtaining data at a fine spatial resolution is often deemed too costly, especially in times of economic crisis and associated budget cuts (Whitelaw, Vaughan et al. 2003, Conrad and Hilchey 2011).

A widely accepted categorisation of citizen science projects is based on the extent to which participants are involved in the project’s origins and the project process, ranging from setup and design to implementation and evaluation. Going from little to almost complete involvement of participants, Bonney, Ballard et al. (2009: 17-18) distinguish between contributory, collaborative and co-creative citizen science projects. Most of the citizen science projects adopt a *contributory approach*, in which participants are only involved to help collect data. However, it is argued that the more involved the participants are, the more impact citizen science projects can have on them in terms of an improved understanding of environmental issues and of science in general (Evans, Abrams et al. 2005). *Collaborative projects* are also designed by scientists, but aside from the participation of citizens in the collection of data, they also have a say in the roll-out of the research project. Finally, *co-created projects* originate from at least a part of the citizens themselves, and are designed in combination with scientists. Contrary to the former two approaches, citizen participants are thus involved in the whole scientific process (from design to evaluation) (Bonney, Ballard et al. 2009). Nevertheless, the evidence about the extent to which the generated scientific literacy, social capital and environmental democracy building leads to environmental benefits is anecdotal until now (Conrad and Hilchey 2011, Dickinson, Shirk et al. 2012).

The challenges that citizen science projects generally face are related to the three objectives they often combine: (1) collecting large scale scientific data, (2) raising awareness amongst the broader public and looking for real citizen engagement in

the matter, and (3) serving society and encouraging political impact. (1) and (3) can be regarded as the external objectives of the citizen science project, they relate to the scientific results and the effects on policy. While the second objective can be seen as an internal objective, referring to evaluating these projects in terms of improving scientific literacy, building social capital, and trigger behavioural change. However, realising all three objectives at once seems difficult in many citizen science projects and requires significant effort (Bonney, Cooper et al. 2009, Brossard, Lewenstein, and Bonney 2005).

Often scientific credibility of the monitored data is questioned by scientist and/or politicians. They express doubts with regard to data fragmentation, inaccuracy, objectivity, experimental design, monitoring expertise of volunteers, quality assurance, etc. (Conrad and Hilchey 2011) In particular, for monitoring air quality the validity and quality of the used materials/devices and methods become more important than for example in birding or ecosystem programmes.

Furthermore, most citizen science results are only scarcely adopted by decision-makers (Conrad and Hilchey 2011). As a possible solution several authors refer to the necessity of “strategic” or “innovative” partnerships in which citizens, academic institutions and government bodies cooperate in citizen science projects. Hence, it is important that the act of monitoring is not the final aim, but that there is a proactive orientation towards influencing policy agendas and measures. As useful and detailed (large scale) citizen-generated data is much sought after by government bodies, fruitful strategic partnerships with government bodies and knowledge institutes can be build (Dickinson, Shirk et al. 2012, Conrad and Daoust 2008).

To maximise the impact it is equally important to get the results published, not only in academic literature, but also for a broader audience of citizens and decision makers (Conrad and Hilchey 2011).

Accordingly, most citizen science projects have at least the double objective of scientific rigour and citizen engagement (and awareness raising). However, having an influence on policy decisions related to the field of inquiry, and/or making sure that the results are used in policy debates, is often put forward as a third objective. This ensures that people are not monitoring for the sake of monitoring, but they feel that the resulting data is relevant and used by policy-makers (Conrad and Hilchey 2011). In our opinion mastering the triple objective is beneficial to increase the chances on bringing about behavioural change of citizens and at the same time getting accepted both by ‘academia’ and politics.

Often scientific credibility of the monitored data is questioned by scientists and/or politicians. They express doubts with regard to data fragmentation, inaccuracy, objectivity, experimental design, monitoring expertise of volunteers, quality assurance, etc. (Conrad and Hilchey 2011). In particular for monitoring air quality the validity and quality of the used materials/devices and methods become more important than for example in birding or ecosystem programs.

Furthermore, most citizen science results are only scarcely adopted by decision-makers (Conrad and Hilchey 2011). As a possible solution several authors refer to the necessity of ‘strategic’ or ‘innovative’ partnerships in which citizens, academic institutions and government bodies cooperate in citizen science projects. Hence,

it is important that the act of monitoring is not the final aim, but that there is a proactive orientation towards influencing policy agendas and measures. As useful and detailed (large scale) citizen-generated data is much sought after by government bodies, fruitful strategic partnerships with government bodies and knowledge institutes can be build (Conrad and Daoust 2008, Dickinson, Shirk et al. 2012).

To maximise the impact it is equally important to get the results published, not only in academic literature, but also for a broader audience of citizens and decision-makers (Conrad and Hilchey 2011).

Recently the internal values of such projects have become a growing theme within the citizen science literature. Hence, aside from tackling the challenges of scientific rigour and policy adoption, this paper also specifically pays attention to the interest and motivational aspects of volunteers, to scientific literacy (knowledge on the topic) and awareness raising aspects (sharing of information, attitudes toward policy measures).

8.2

The project's (grass)roots

The Citizen Science project *CurieuzeNeuzen* (a wordplay in Antwerp dialect that relates to “nosing around”) was launched by the Ringland Academy, a think tank within the Ringland citizen movement (<http://ringland.be/>). Ringland started in 2014 as a bottom-up initiative within the city of Antwerp (population 517,000⁸²), and was established by a collective of spatial planners, architects, and other professionals. The Ringland initiative envisions a new future for the city of Antwerp by proposing a complete redesign of the Antwerp mobility system and a “capping” of the ring road that traverses the city. In the Ringland plan, this circular highway would be moved entirely underground in a tunnel system. This would entail a substantial improvement of air quality and allow large-scale development of new green areas within the inner city (Van Brusselen, Arrazola de Oñate et al. 2016). With the aid of an attractive and innovative (multi)media campaign, Ringland has developed into one of the most prominent civic initiatives within Europe these days, mobilising thousands of citizens to support their campaign. The mobility debate in Antwerp is already going on for a long time, with subsequent infrastructural master plans of the Flemish government being rejected through the lobby and advocacy work of increasingly strong citizen movements (Van Brussel, Boelens, and Lauwers 2016). Ringland is different, however, from many other citizen movements by incorporating three different roles in the mobility debate in the city of Antwerp in recent years. The role of citizen movement (or “activist group”) is combined with the role of knowledge network (feeding the public debate at regular intervals with ideas around mobility, city planning, and quality of life), and finally that of policy influencer through their participation in policy preparation processes and high level negotiations. For example, in 2015, through the active advocacy work of Ringland an “intendant” was installed by the Flemish government with the mandate to

82 Legal population in Antwerp as of January 1, 2016 (<http://statbel.fgov.be/>).

demine the heated mobility discussion and to harmonize the vision of the different stakeholders. In April 2017, a breakthrough accord was negotiated with all mayor players and political parties promising a gradual capping of the ring, with more ambitious targets for sustainable mobility by 2030, and a more inclusive governance system for all large-scale infrastructure works in the province of Antwerp. The intendant managed to break the deadlock, especially by giving the different parties a more equal position in the policy debate. Because of this, the intendant has gained credibility and respect amongst the stakeholders, and through positive reporting in the media, possibly also amongst the wider public.

The Ringland Academy has brought together a wider group of experts and professionals beyond the core Ringland team. They offer ad-hoc inputs into Ringland's activities, contribute to ongoing study work, and develop projects related to one of the core-themes of Ringland. The *CurieuzeNeuzen* project has been one of the main outputs of the Ringland Academy up to now. Aside from its objective to better understand air quality problems in Antwerp, *CurieuzeNeuzen* was created to sensitise and trigger Antwerp citizens (and politicians) about their living environment and the urgency for action with respect to traffic-related air pollution. The idea of the project was originated in the Ringland Academy, but the project was fully designed and implemented by a temporary project team of volunteers. They were identified during the annual Ringland music festival by putting up posters with vacancies for specialists in various disciplines, for which not only sympathisers but also other inhabitants and passers-by in general could apply. During the festival, most of the applications were completed and a diverse project team was established with volunteer-programmers, -database analysts, -communication experts, -scientists, and others. For a majority of the team members it was their first experience with volunteer work for Ringland.

8.3

Setup of the *CurieuzeNeuzen* project

The *CurieuzeNeuzen* project was finally turned into an air quality measuring project, focusing on the average nitrogen dioxide (NO₂) concentration at a household resolution per street. NO₂ was measured using a cost-effective standard protocol during the month of May 2016. The NO₂ pollutant was chosen as indicator for air quality here, since the project is to be situated in a mobility context and abundant scientific evidence shows that air pollution by NO₂ is more traffic-related, than, for example, particulate matter (Carslaw 2005).

From meeting minutes of the project design phase it can be derived that the *CurieuzeNeuzen* team was not willing to compromise on scientific relevance for the sake of citizen participation. Therefore, after a review process of different NO₂ measurement devices, the project settled for Palmes diffusion tubes to map NO₂ concentrations⁸³. The team preferred the tested Palmes tubes (Palmes, Gunnison et

⁸³ The type of Palmes diffusion tubes that were used in the *CurieuzeNeuzen* project, were tested by the Flanders Environment Agency in earlier research and gave reliable results

al. 1976), rather than digital devices for cost-effectiveness and simplicity reasons, allowing to reach out to large numbers of citizens. Several studies show that the passive monitoring method is complementary to the continuous measurements based on chemiluminescence used in reference methods (Lewné, Cyrus et al. 2004). The performance values of these tubes have complied with the European Union data quality objectives for indicative measurements of ambient NO₂ concentrations. Additional quality control steps were undertaken to strengthen scientific rigour. At different phases of the project, the team consulted leading experts on air quality to review ideas and options. In addition, permission was sought from the Flemish Environmental Agency (VMM) to allow for the calibration of the Palmes tubes in the eight reference monitoring stations located in the study area. In an effort to further improve data reliability, the team designed a standardised and foolproof set-up, which had the additional advantage of creating visibility for the research project. A measuring setup (as illustrated at www.curieuzeneuzen.eu/en/about/) was used, whereby a measuring board was attached to a window pane, containing two Palmes diffusion tubes sampling NO₂ selectively from the ambient air. The board allowed the tubes to be hung on a fixed distance from the building, improving the measurement's standardisation. The total amount of NO₂ collected in the tube's gel is a measure of the mean concentration of NO₂ in ambient air. For quality control purposes two tubes were used at each location and the mean value of those two measurements was used for data analysis. Simple instructions were designed with a lot of visuals and supported by video. Finally, a tight plan was designed to guarantee the swift distribution and collection of 2,000 sets, and the exact recording of measurement times, height, etc. After four weeks, the tubes were collected, stored in a fridge and brought to the lab for analysis.

The project was announced on March 22 in local newspapers, on social media, and on the Ringland website. The initial goal was to distribute 1,000 sampling packages amongst citizens around Antwerp in order to obtain a fine-meshed monitoring network of air quality data, suitably covering the study area. But within 12 hours after the launch of the project website, the number of volunteers already exceeded the initial 1,000 participants limit. This illustrated that there was a large interest – and that the possibility of “measuring air quality on the doorstep” was somehow dear to the inhabitants of Antwerp. In total, about 2,600 people ended-up registering for participation. To accommodate for the unexpected success, it was decided to raise the participant number to 2,000 monitoring points. The selection of who finally could participate was based on several criteria, especially focused on having measuring points that were suitably equidistantly distributed across the inner city of Antwerp and its neighbouring districts; and obtaining a mix of individual citizens, schools, and other institutions. Eventually 1,996 sampling packages were installed, of which 1,840 by citizens, 51 by schools, 10 by hospitals, 45 by companies, and 15 by other organisations. Additionally, 35 points were located in public parks and viaducts crossing the ring road highway. Participation in the project was free and on a 100% voluntarily basis.

Participants could collect their sampling packages on four different pick-up moments at one central location (theatre “De Roma”) between April 24–30 (2016). A sampling package included a sampler board, the samplers themselves, as well as a clear description on the scientific protocol to follow. The actual air quality measurement started on April 30 and ended on May 29. At the end of the campaign,

sampling packages were handed in again at the same central location. During the measurement campaign, participants were asked to fill in technical questionnaires sent by email to verify the location and height of the tubes, and to document exceptional issues which could affect the measurements (e.g. a fire nearby, tubes getting damaged, etc.). With 98% of the measurement sets returned⁸⁴ for scientific analysis, the project realised an exceptional return rate. The volunteers engaging in the *CurieuzeNeuzen* project team were also involved in the data-interpretation. To make this possible, the data was visualised on maps and, in several sessions facilitated by two experts, the team critically reviewed the findings neighbourhood by neighbourhood, checking for consistency and anomalies, drawing conclusions, and identifying possible patterns.

All participants were invited to the Ringland Festival on 25 June, as the preliminary results were presented there on a large 4x4m canvas, with an estimated 1500 people coming to view and discuss the results. A log book was provided for participants to note down the results which stood out, together with possible clarifications. The preliminary findings were also picked-up widely in the local and national audio-visual media and papers, and on social media. Along with the preparation and validation of the air quality results, an online survey was launched in order to know what participants learned from their participation in the citizen science project and how this changed their attitude towards mobility measures, behaviour, etc. Also, the reasons for participation were probed and demographical data was gathered. The final results were presented on a feedback event at a large theatre (De Roma, in Antwerp on 22 October 2016) for a public of around 900 participants. During the event, leading policy-makers, including the head of the European Environmental Agency, a representative of the mayor of the city, and the head of Ringland were asked to comment on the findings and their implications for the city of Antwerp. After the more general presentation, people were asked to pass by the information stands of the *CurieuzeNeuzen* results of their own neighbourhood. They engaged in the verification of the results (coloured dots on the map) and were asked to think of possible explanations, especially where results seemed rather deviant.

8.4

Results

8.4.1

Scientifically rigorous air quality data

Only a brief summary of the actual air quality measurement findings is provided here, mainly to demonstrate their academic and societal relevance. An in-depth discussion of these data is the subject of separate submission to another peer-reviewed journal. A high-quality data-set was obtained, which revealed large

84 From these another 2% of the sets were disqualified by the laboratory doing the quality control and analysis.

differences in air quality across the city of Antwerp. NO₂ concentrations varied over short distances (100 m-scale) ranging from around 30 µg/m³ within urban greens to over 60 µg/m³ in traffic-congested street canyons (Figure 91). Multivariate data analysis identified that three factors (traffic intensity, street geometry, and the distance to the ring road) explained spatial variation in observed NO₂ concentrations.



Figure 91 Air quality results map of the Curieuzeneuzen citizen science project. Source: <http://www.curieuzeneuzen.eu/>.

The *Curieuzeneuzen* results contribute to the growing body of knowledge about urban air quality in two main ways. First, the between-street differences turn out to be larger than predicted by the existing computer models, that particularly appear to systematically under-estimate the level of pollution in the street-canyons. Secondly a substantially larger part of the sampling locations (45±10%) has concentrations that exceed the WHO yearly NO₂-limit of 40µg/m³, compared to what computer models predict (2%).

Aside from the quality control steps described in Section 8.3, networking with academics and experts was actively pursued throughout the project cycle to

increase the chance of academic recognition and uptake. The fact that some members of the *CurieuzeNeuzen* team had a research background, although not in the area of air quality measurement, still helped to access and establish these academic contacts. Additionally, three universities were approached for technical and financial support. Once the plans became more specific, the Flemish Environmental Agency (VMM) and the VITO research institute, which does the modelling of air quality data in Flanders, were approached not only for technical advice but also to discuss how the research could contribute to ongoing research efforts. The fact that VMM had identified citizen science as one of its emerging research areas, facilitated collaboration, although the institute was careful not to rush in its engagements. By the time the data collection started, significant interest in the data-set was shown by these research institutes and at the time of writing of this paper, the different parties were comparing the empirical data with existing air quality models.

8.4.2

Fruitful cooperation with and adoption of *CurieuzeNeuzen* results by policy-makers

CurieuzeNeuzen engaged in different ways with the city administration. The project became national news during various stages of the campaign, gradually putting the air quality problems in Antwerp higher up on the political agenda. However, the ground work for the policy influencing agenda of *CurieuzeNeuzen* started earlier through initial contacts with the city administration.

Rather than publicly exposing the city administration or policy-makers and in line with the overall constructive approach of Ringland, meeting minutes and project team observations indicate that a dialogue was sought with the relevant administrative services, e.g. the environmental task-force of the city administration, responsible for the production of updated air quality maps. *CurieuzeNeuzen* submitted a modest funding proposal to a fund of the city which supports small sustainability initiatives, covering only a fraction of the total budget. But more importantly, it became the start of a fruitful dialogue with the city administration, which initially was not at all convinced that the project would generate any relevant data. Through regular contacts trust was built, e.g. by sharing tentative results first with the city administration before making them public to allow them to prepare a balanced response. Later on, personal communication of the project team demonstrates that contacts with the political level were pursued. At the end of the campaign, there was broad-based support within the city administration for the overall campaign, both in terms of the air quality findings and the behavioural change it had triggered with the participants. The administration actively participated in the final symposium, by including two information stands during the event, a shared press conference, and a political representative participating in a panel debate.

Since *CurieuzeNeuzen* originated from Ringland, the main movement opposing the largest infrastructural plans of Belgium, getting buy-in from the political level was rather sensitive, yet happened in different ways. As soon as the campaign was launched it attracted media attention because of its scale and the overwhelming

response to the first calls for participants. Local television stations and newspapers started picking it up on the day of the launch, national media followed soon after. Some leading politicians of opposition parties residing in Antwerp even decided to participate as citizens in *CurieuzeNeuzen*. As such, ignoring the campaign became difficult at the political level.

Meeting minutes, frequency of meetings and personal communication between members of the project team illustrate that in the period leading up to the announcement of the final results in October 2016, the political contacts intensified, culminating in a joint press conference to launch the findings with two city councillors, three universities, and Ringland. In the weeks after, opposition parties used the findings to question the air quality policies of the city of Antwerp and the Flanders regional government through interventions in the town council and in the Flemish parliament. Between October 2016 and January 2017, almost every week media were reporting about air quality news items, hereby regularly referring to the *CurieuzeNeuzen* project. As an example, the largest newspaper in Belgium featured an interview with the director of the European Environmental Agency in which he was asked to share his views about *CurieuzeNeuzen*:

“Antwerp has set the standards for Europe. Both regarding data quantity and quality the research projects is amongst the absolute top. From now on, I will use this research project as a school example when giving lectures, since the rise of both knowledge and citizen involvement is of major importance” (H. Bruyninckx, director of the EEA, as in PJBA 24 October 2016)

The political opinion on the *CurieuzeNeuzen* results was the subject of discussion in the written press and media. The political majority in Antwerp sought confirmation in the *CurieuzeNeuzen* air quality results for the “promising” policy measures they had already planned: the low emission zone (LEZ) in Antwerp and further investments in public transport. However, the opposition saw in the results an urgent call for more extensive measures and they insisted on more short-term actions, e.g. lowering the speed limits on the ring road, more frequent public transport services, and a park and ride strategy. By some it was proposed to include the ring road itself to the LEZ (cf. now the within area of the ring, but excluding the ring), as the results showed that the ring road had a major negative influence on local air quality.

The results of the monitoring campaign raised an overall awareness for the theme of air quality and quality of life in the city. The findings of the project featured in several local newsletters of neighbourhoods. As such, activist groups used the findings to call local government to action. Furthermore, the results were also used by teams of architects working on the capping of the ring, and at an individual level, many stories were shared by citizens on how they looked differently at their environment due to the project. For all those who were not particularly aware of the problem before, the pamphlets and posters revealing the results and the local and national media coverage on the *CurieuzeNeuzen* project have raised a sense of urgency, and have made it a very visible and personal matter. That is also why in the areas with the worst air quality, some participants appeared not keen on publishing the results poster at home, due to the fear of a decreasing value of their house. Some schools were reluctant as well, for they feared to lose pupils due to the reported air pollution levels.

Furthermore, not all media coverage was contributory to the general knowledge accumulation and sensitisation on air quality issues and the necessary mobility behavioural change. Without any communication with the research team and regardless of the research scope and focus, the Antwerp Airport authority distributed promotion pamphlets stating that the *CurieuzeNeuzen* results proved that air traffic appeared not to have a major influence on the local air quality⁸⁵.

8.4.3

Citizen engagement and the effects of participation on participants

Participant's profile, motivational factors and perceived air quality

As awareness about liveability and air quality issues affects all citizens regardless of their age, gender, family situation, and level of education, the project was aiming at attracting citizens with different backgrounds by communicating in easily understandable language and through popular media. Although the group of higher educated citizens with ecological interests was well represented, the project managed to reach out to a wider group of concerned citizens from different age groups, and social and educational backgrounds (see Appendix 4). Meeting minutes of the project team proves that additional efforts were taken to reach out to Antwerp citizens with a migration background as experience learns that they are using different media channels and are less likely to be reached by traditional citizen science initiatives. A sub-team raised awareness amongst representatives of the Muslim communities in Antwerp, resulting in the participation of around 30 families with a Muslim background. This is still limited but does show that additional efforts can improve the participation of hard-to-reach groups.

Participants received questionnaires before and after the publication of the *CurieuzeNeuzen* results. With response rates of around 76% for the first survey and 40% for the second survey, the survey findings provide a representative picture of the participants' perceptions.

When asked about motivational factors for participation, most of the participants reported to participate out of curiosity about the local air quality in their street (91.8 %). Other (or additional) reasons for participating were: raising the importance of air quality amongst neighbours and local passers-by (62.3 %), making the citizen movement Ringland known to a wider audience (59.9 %), and being intrigued by taking part in a real research project (39.8 %)(n=1,412). At the start of the measurement campaign, only 5% expected a good to very good air quality in their street, compared to those who assumed it to be moderate (40%), or (very) bad (50%) (n=1,414). As the urban air quality was perceived quite negative, this emerged as a main driver to actually subscribe for participation. After having seen the published air quality results, 59% of the participants agreed that the air quality measurement conformed with their expectation (n=631). For some, the measured air quality results were better than expected (27 %), while 11% underestimated the level

85 However, the *CurieuzeNeuzen* project specifically addressed road traffic and therefore used the NO₂ pollutant as indicator. For measuring direct aircraft-related emissions and impacts on ambient air pollution in the surroundings, other pollutants are more appropriate and indirect airport activity related pollution should also be taken into account (Masiol and Harrison 2014)

of ambient air pollution in their vicinity, leaving them with a worse scenario than initially presumed.

Outreach of the project

Public outreach and awareness raising are critical components of citizen science projects. The impact of outreach can be assessed through different “circles of influence”: (1) the participants themselves, (2) direct interactions between participants and others, and (3) information to the general public through press coverage and the visibility of the campaign in the streets. Accordingly, the surveys integrated questions that indicated the outreach. As the focus of the research was more on the impact of *CurieuzeNeuzen* on the participants than on the general public, surveys were targeting the participants. However, a rough indication of the project’s influence on the public debate about air quality can be found through an analysis of the press coverage.

The *CurieuzeNeuzen* project is estimated to have reached 5,610 people directly (participants were asked about the number of people residing in their house, n:1,395). Indirectly, another (estimated) 35,400 persons⁸⁶ were approached by the *CurieuzeNeuzen* participants to discuss about the project (n: 660), especially friends, family members, and neighbours, and to a lesser extent colleagues and fellow social activity members (see Annex II). A tertiary outreach was achieved by the adoption of the *CurieuzeNeuzen* air quality results in the media (the written press, digital media, and the social media), where the project received nationwide interest. When the measurements started, *CurieuzeNeuzen* was an item on the Flemish television news at primetime (ca. 1,160,000 viewers), the same happened when the tentative results and later on when the final results were announced. Since the project announcement in March 2016, more than 70 newspaper articles were reporting on or mentioning *CurieuzeNeuzen* at local, regional, and national level, including one front page of a national newspaper, and at least three page 2 commentaries from newspaper editors. In at least four national radio programmes, well-known actors and artists mentioned their participation to *CurieuzeNeuzen*. In addition, with nearly 2,000 announcement boards (3D real-estate form) attached to houses in almost half of the streets in the inner city, the project was quite visible during the measurement campaign. Further promotion was done by (1) asking the participants to distribute short leaflets about *CurieuzeNeuzen* (50,000 copies) amongst their neighbours, (2) the large 4x4m canvas on the Ringland festival, and (3) by distributing posters with the actual measurement results to the participants so that passers-by could also see the results on a given street. Later on, team members were asked to do presentations about the project in schools, other civil society movements, and at two universities.

In September 2017, it was announced that the *CurieuzeNeuzen* team would receive the Science Communications Prize 2017 from the Royal Flemish Academy of Arts and Sciences for its contribution to science communication in Flanders.

86 This total number is re-constructed from the answers provided by a representative sample of *CurieuzeNeuzen* participants to a range of questions about the number of people (separate questions for family, friends, neighbours, etc.) they had talked to about *CurieuzeNeuzen*.

The combination of communication strategies at different levels therefore resulted in large groups of citizens participating or hearing about *CurieuzeNeuzen*, both directly and through the media. This was further re-enforced by the strong media profile of Ringland itself. The academic recognition of the communication efforts provides an additional indication of their relevance and uptake.

Effects of participation on attitude and behaviour

Due to participation in the *CurieuzeNeuzen* project, participants reported to act differently or plan to do so in the near future (Figure 93). Amongst the biggest self-reported behavioural changes noted were: “informing other people about air quality”, “selecting healthier biking and walking routes” and “greening my façade and street”. The sensitizing objective has thus had its effect. Many participants already had quite a sustainable mobility pattern, with around 65% (n=655) indicating they were already using the bike a lot and limiting car use, but this number further increased to almost the full group after the project. Interestingly, a substantial group wanted to take advocacy action (from 8% before having seen the results, to 57% after the publication of the results). Finally, a large group caught the research virus, with 61% indicating they plan to do more research on air quality.

Participants were asked about their attitude change towards certain local upcoming or already established mobility measures in Antwerp compared to their initial attitude before the start of the *CurieuzeNeuzen* project (see Figure 92). The public support increased for almost all mobility measures compared to before the start of the project. A substantial number of people indicated they had a (much) more positive attitude towards an environmental-friendly city distribution system (57%), park-and-ride zones outside the city (51%), and public transport (51%). Interestingly, the participants were also more positive about measures which tend to be less popular, such as congestion taxes for cars (46%) and the introduction of a LEZ (34%).

A specific measure related to the Antwerp context is ‘realising Ringland’ (cf. Section 3.1) which brought about the most change in attitude, approximately 60% indicated being (much) more positive towards it. This score can not only be explained by the profile of the participants, which counted a good number of people which already supported Ringland. From the first survey, we concluded that there was at least a group of 30%-40% whom were not necessarily supporting Ringland at the start of the project. Another explanation might be that the Ringland concept precisely addresses the air quality aspect by capping the ring road and by choosing for a radical modal shift. Contrary to this, the alternative option provided by the government: “the Oosterweel Link” is associated with more traffic-related air pollution and therefore the least moving of all, causing only about 13% of positive change in attitude and 35% becoming (much) more negative.

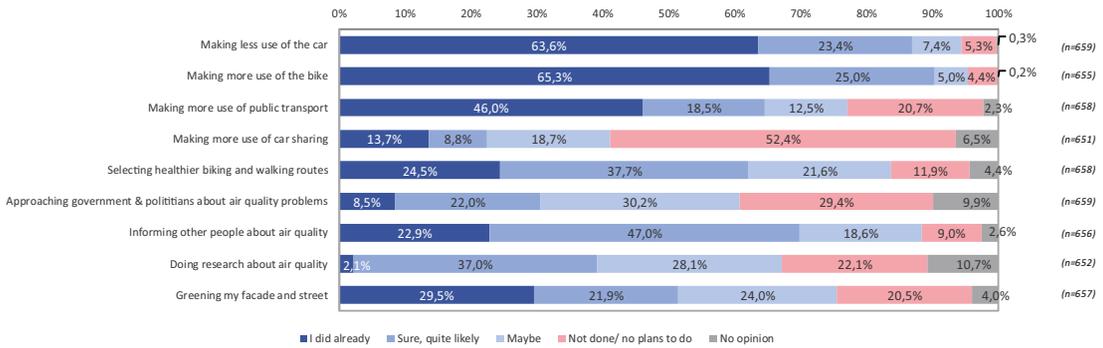


Figure 92 Has your attitude changed regarding possible solutions to improve air quality (compared to before the start of Curieuzeneuzen)? (n=660)

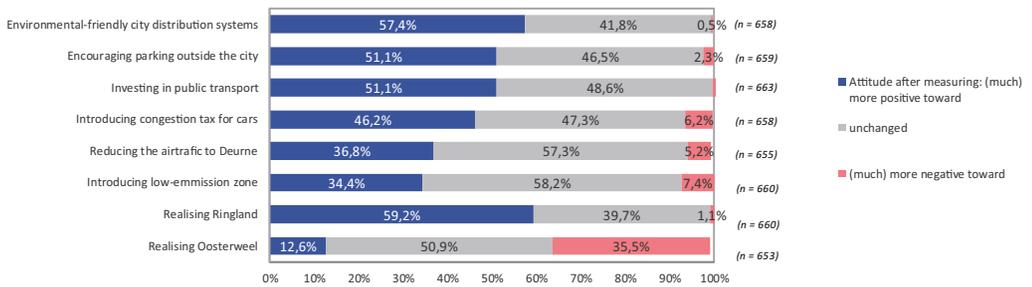


Figure 93 Are there things you are doing differently or plan to do differently because of your participation to Curieuzeneuzen? (N=655)

8.5 Discussion

Citizen Science projects can offer a wealth of information, and can reach large scales and fine resolutions for data collection and monitoring. But the practice is not yet universally accepted as a valid scientific method. However, due to the expanding field and experience, citizen science is gaining scientific legitimacy by its attempts to account for credibility and validity issues through refining citizen-scientists protocols, the increasingly closer collaboration between scientists and citizens, etc. (Bonney, Shirk et al. 2014). This paper on the Curieuzeneuzen project results and dynamics contributes to the expanding citizen science field and elaborates on the triple objective of scientific rigour, policy influence, and deep citizen engagement, necessary for accumulating social capital in the transition towards a more sustainable development, and mobility in particular. While previous sections discussed the citizen science project design, process, and outcomes, this section further unpacks the underlying dynamics, success factors, and limitations.

8.5.1

Right Moment and Place for Citizen Science?

External factors created a sense of urgency around air quality issues in Antwerp. The mobility situation around Antwerp has deteriorated over the years; it is now one of the main traffic hotspots in Europe. Ringland, other local civil society groups, such as Ademloos, and academics have raised awareness about the associated air quality and environmental health risks, pushing the topic gradually higher-up the political agenda. Earlier plans to improve the mobility situation were repeatedly rejected because they did not address the health problems, nor the lack of green areas, and quality of life. Meanwhile, many citizens became eager to learn whether the air quality was indeed so problematic in their street. *CurieuzeNeuzen* used this window of opportunity by offering access to a free but reliable measurement devices. In addition, several research institutes and governmental bodies were looking for large-scale empirical air quality data-sets to validate the existing computer models, and possibly as baseline to assess the impact of new mobility measures.

At least four internal factors played a prominent role in amplifying the effects of the project. Firstly, the *CurieuzeNeuzen* project originated within the Ringland initiative, and could build at regular intervals on its mobilisation power, its strategic reflection capacity and communication services, and its logistical support.

Secondly, the reputation and credibility of Ringland further facilitated access to academic networks and the city of Antwerp. After a laborious project negotiation around the proposal, the research design was settled. The necessary funding from the partner-sponsors followed, though a substantial share came from crowdfunding. More importantly, policy relevance and adoption was strengthened as the negotiations and engagements resulted in a closer collaboration of the research project team with these partners. For example, the city administration is considering to use the results of *CurieuzeNeuzen* as baseline to monitor the effects of the LEZ as of 2017 in Antwerp. Meanwhile, the government's desire to be more inclusive and actually engage citizens is also met.

Thirdly, while there was support from Ringland at different stages, the *CurieuzeNeuzen* project was careful to keep a certain distance from Ringland. The scientific independence of the research was prioritised to guarantee that the advocacy agenda of Ringland would not be conflated with the research agenda. All the communication with participants was done under the *CurieuzeNeuzen* banner, avoiding direct mailing from Ringland unless participants had indicated interest in receiving information about Ringland. The same applied to communication with the press and the city administration. This allowed the team to keep its scientific credibility, and avoided a situation where participants felt that they were pushed into endorsing Ringland if they wanted to participate in *CurieuzeNeuzen*.

Fourthly, through the diversity in the technical skills of the project team, the project had direct access to professional communication, high level programming, database management, statistical analysis, survey management, etc.

8.5.2

Successful co-created citizen science initiative

The *CurieuzeNeuzen* project can be regarded as a co-creative citizen science programme (Bonney, Ballard et al. 2009, Bonney, Cooper et al. 2009) since the project originated from the bottom-up, was implemented through the joint efforts of volunteer-experts, and a team of engaged citizens (see also Section 3.2). During the design and start-up phase contacts with three research institutes were gradually established and later on formalised. This collaborative nature is also mirrored in the funding of the project, which combines crowdfunding with contributions by three research institutes, the city of Antwerp and Ringland. Furthermore, *CurieuzeNeuzen* can be considered a successful co-creative or bottom-up citizen science initiative for additional reasons. Firstly, the project started from the bottom-up, but unlike other bottom-up citizen science initiatives did not lack organisational capacity or research validity (Bradshaw 2003); the project has reached not only scientific objectives but also political ones. Secondly, the project reached a diverse audience directly (actual participants) and indirectly. Participants engaged in the project team were involved in all steps of the research process, from the set-up, to the data analysis and the eventual evaluation. Additionally, all participants were encouraged to attend several public feedback moments organised together with opinion makers, multiple knowledge institutions, and politicians, that were always framed within the bigger mobility context. The *CurieuzeNeuzen* air quality results have further fed the political discussion about the necessary mobility measures to take (cf. public transport, LEZ, etc.). Thirdly, in the survey, many participants reported to have learned new things, to have changed, or adjusted their attitude towards mobility measures and their behaviour with respect to displacement patterns. Though we must note that those are short term effects; measuring the effects of participation on the longer term is more challenging, but an interesting topic for future research. Additionally, an ambitious project as the Ringland initiative is increasingly considered a plausible way of realising a better quality of life in Antwerp. The *CurieuzeNeuzen* project appeared successful in building social capital and bridging the gap between the scientific and the practice as indicated by the broad project outreach.

8.5.3

Limitations

Despite the many efforts to engage inhabitants in the project from all ranges of society, a bias towards higher educated people, aged between 26 to 50 years, was visible. The project's strategies to engage with the large group of citizens with a migration background were only partially successful. Secondly, the analysis of the participants' profile, motivations, and perceptions was constrained by the limited number of questions in the survey. The project team did not want to put off participants with a long list of survey questions. Additional in-depth interviews with a selection of participants would have increased the insights in how they experienced the project and get a better understanding if the expressed intentions about sustainable mobility were likely to be acted upon. Thirdly, as the project was careful to preserve a certain distance from the advocacy role of Ringland, this did affect the

survey. Questions about Ringland were avoided as much as possible to avoid scaring away the large group of participants that were interested in the study, but were not necessarily supportive of Ringland. Fourthly, as the main focus was on gathering air quality data, the social and learning aspects were at first not elaborated and gained attention during the campaign. Therefore, by the end of the project, the surveys were prepared and distributed rapidly (by volunteers from the project team) and by lack of enough ICT-experience and time, accurately matching answers from the first and second survey appeared infeasible in the end. Nevertheless, we do not think this makes the results and interpretation less relevant, but the interpretation is much more indicative and therefore we consider it a missed opportunity to make our contribution even more valuable.

8.6

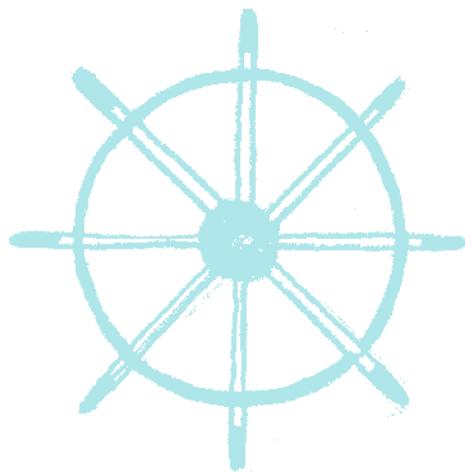
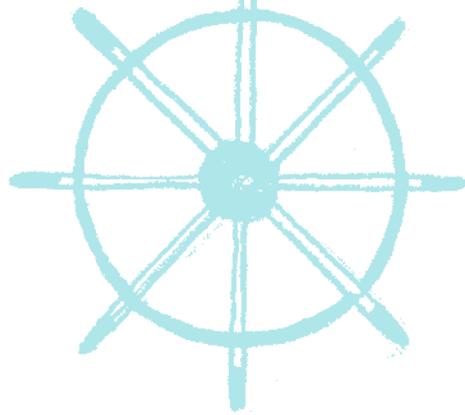
Conclusions Curieuzeneuzen

The *Curieuzeneuzen* project can be considered successful in the way it created both internal (contributions to personal learning and development) and external value (public utility of data for decision-making process) (Conrad and Hilchey 2011). In the aftermath of the project, Ringland and other civil pressure groups were given an active role in the further mobility decision-making process.

The project allowed the measuring of air quality on a very detailed and large scale, and the involvement of volunteers from all over Antwerp. The project showed a highly variable air quality from street to street with the proximity to major roads (i.e. the ring road and Singel) amongst the most contributory factors to local air quality. Nearly half of the measurement locations registered NO₂ concentrations that are expected to exceed the WHO yearly limit. Hence, the sensitizing effect of both participation in the project and the project results themselves that were dramatically displayed as red dots on the map, were substantial. The project roused a sense of urgency to act among inhabitants and politicians to act. After the project, participants indicated in a survey to have improved their scientific insights and knowledge on air quality. Moreover, they reported to have adjusted their attitude towards mobility measures and certain behavioural change was explicated (cf. use of the bike, preference for car-free routes, car sharing, informing other people, etc.). The survey results illustrate that the *Curieuzeneuzen* project builds toward knowledge accumulation, through which social capital and eventually behaviour change can be catalysed. Future research could focus on the longer-term effects of this kind of project on participants. Further improving the participation rates of citizens with a migration background and other hard-to-reach groups is also a future challenge.



Conclusions



9.1

Main findings

This dissertation started from the observation that solving mobility issues and governing mobility remains troublesome. The prevailing mobility planning approaches are still entrenched in a technocratic oriented discourse, that is strongly oriented towards hardware and software solutions. Those approaches do not prove effective to launch the mobility transition as they either have faced an increasing opposition, or their solutions have generated undesired side-effects, that in turn developed new problems. Because of this, mobility issues, have increasingly become wicked problems. Adopting an orgware that complements hardware and software approaches and that aligns all those interventions lags behind. Only more recently, orgware interventions, focusing on the actors, the institutions, and the conditions are becoming part of the mobility governance scope. With orgware we mean the organisation in all its facets, e.g. alignment between actors, factors and institutions emerging in the mobility (planning) scene. In this research we came up with a strategy to unravel the (case specific) mobility orgware in order to formulate an orgware agenda. A research outline was specified (cf. Section 1.3), corresponding this dissertation's chapters, and subquestions were formulated to enable us build our answer to the central research question: ***What can an orgware agenda add to hard- and software solutions tackling complex mobility issues?***

Hereafter, the results of each research step are resumed by giving an answer to the subquestions. In the next section, more general conclusions are formulated to address the central research questions and policy reflections and avenues for further research are stipulated.

a Why are mobility problems often wicked, and why is the mobility transition complex?

We started from the assumption that the mobility issues of today are inherently wicked. As space is scarce, the implementation of large infrastructure projects or urban development projects often meets with serious resistance by local citizen movements, environmental actors, inhabitants, and sometimes governmental actors as well. Other mobility interventions or discussions, such as the establishment of a low emission zone (LEZ), a circulation plan, a pedestrian zone, a congestion charge scheme, parking schemes, etc. do not escape this opposition either. As such, an ever growing and increasingly empowered number of actors enter the mobility planning scene, and renders mobility issues wicked and the governance of mobility complex.

To address this wickedness appropriately a systemic approach to mobility is necessary, an approach that takes into account all its parts; the actors, its setting, and their interplay. The multi-market mobility model served as the starting point for the fundamental orgware approach we propose: the complex adaptive system of mobility. The model has an eye for all the aspects that influence mobility choices and travel patterns, and it embeds mobility in a broader societal and environmental system of resources and impacts (cf. Figure 94). The CAS of mobility comprises a

travel market, a transport market, and a traffic market. Those interrelated markets do not act in a void, but are depending on resources⁸⁷ and exert a certain impact on the broader socio-technical (hyper-)system⁸⁸ – also . Each of those ‘markets’ is to be considered as a dynamic assemblage of actor network associations shaping and being shaped by their conditions. The mobility system can be regarded as a CAS, within the greater societal/environmental system, and on micro-level. It consists of various dynamic features influencing each other continuously: socio-demographic factors, macro and micro-economic trends, socio-cultural trends, the pluralisation of life- and subsequently mobility styles, the impact on pollution and health, technological and logistic innovations, and the respective policies.

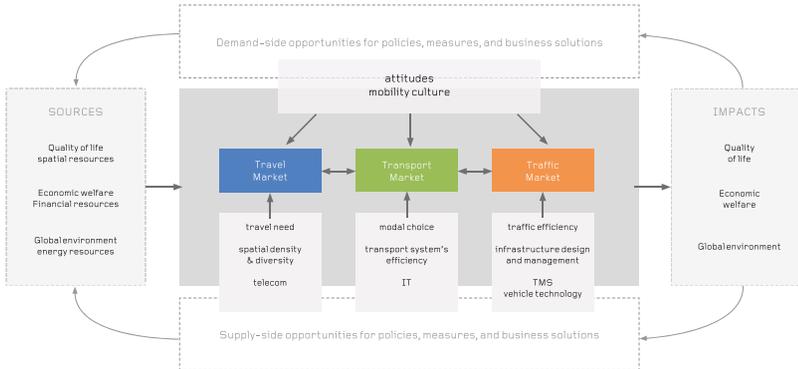


Figure 94 Mobility arenas and their embedding in the environment.
Source: Lauwers and Allaert (2013).

The governance of that mobility CAS, goes beyond just intervening in hard- and software of the separate markets. It aims at a co-evolutionary alignment of the interrelated components. Therefore, this research comes up with a twofold challenge: connecting the system’s components and creating the right context or thus the focussed conditions for that. To address that challenge we need to go in detail about the components of the CAS of mobility. As we started from the basic observation that present approaches do not meet the encountered complexity of the real world, our research adventure starts with embracing complexity.

Adopting a complexity perspective implies a considerable change of mind, as certainty and predictability are replaced by emergence and a-linearity, resulting from self-organising patterns, and co-evolutionary processes. “Complexity-proof” planning approaches are actor centred and require the emphasis to shift from the present, ad-hoc planning based on the here and now, towards planning for an “undefined becoming” (Boelens and De Roo 2014). The wicked problems generated by those dynamic interrelated parts and subsystems therefore cannot be answered by generic formulas. Hence, situational approaches gain attention over generic ones (De Roo 2012, Jessop 1997). A CAS is defined as a complex system that comprises

87 Resources: both material (e.g. fuel, space, energy, etc.) and immaterial (e.g. financial resources, knowhow, economic welfare, etc.)

88 Impacts: both material (e.g. exhaust emissions, appropriation of space for infrastructure, etc.) and immaterial (e.g. socio-economic impact of (reduced) accessibility, etc.)

many subsystems and hyper-systems or environments at multiple (scale) levels, which are all continuously self-organising in the interaction with each other and with their setting. When zooming out, to see the bigger picture, the detail of the parts dissolves and the subsystems they shape become visible. From this perspective we can observe the co-evolution processes, as the aggregate of the self-organising actor networks.

b Who and/or what is at the basis of a mobility transition?

But, more precisely, what does this mean for mobility? How do mobility patterns arise? Who or what is at the basis of those patterns? To answer those questions, we took an actor-centred perspective that is built on the actor network theory (ANT) and the actor relational approach (ARA). The ANT theory presumes that actors should be perceived as parts of associations or actor networks. ANT is based on the idea that actors are continuously networking and by this acquiring meaning (within their network). Everything has to be considered as actor network; focusing on either the actors or the network is a matter of zooming in or out. Everything is considered as part of an actor network. In the quest to reach their goals, actors form dynamic alliances with other actors that strive for the same ideals, plans, objectives, etc. Actor network associations emerge from those continuous interactions, “self-organising processes”. ANT and ARA identify four phases in actor networking, the so-called “translations”: problematisation, interessement, enrolment, and mobilisation of allies or institutionalisation. The ARA approach specifically addresses the role of spatial planners in these translation phases. Therefore, the ARA refines those four steps into seven, and even formulates a step towards a future beyond the plan; including the development of a regime and shaping an “associative democracy”. Those steps reflect the importance of strategic partnerships (regime development), and of reconnecting with the citizens and the continuous search for legitimacy (associative democracy). ARA further stresses the importance of a mixed actor network association in which strategic partnerships between the civil, public, business, and knowledge sector are strived for. As actors eventually want to get their views or actions institutionalised, i.e. adopted and facilitated by formal and informal sets of rules, plans, etc. we conduct a brief inspection of the institutional theory perspectives.

Institutions were defined as ‘collections of rights, rules, principles, and decision-making procedures that give rise to social practices, assign roles to the participants in these practices, and guide interactions among the participants’ (Young 2017: 27). Several perspectives conceived how institutions are formed: the path dependent, the sociological, and the institutional change perspective conceptualising windows of opportunities. From this review, we extracted that history matters for the future course of institutions (North 1990), but that history does not determine everything. Indeed, in correspondence with the proposed actor centred approach, in the institutional theories, the actors themselves are given a central place as well, for instance in the structuration theory provided by Giddens (1984) amongst others. Institutions can change, if the actors decide so. However, not all change necessarily implies a more effective outcome, as people only have bounded rationality, and cultural significance and habitual behaviour play a role as well. This central role for actors, stemming from their autopoietic, structural, and self-organising

capacity, must be taken into account when looking for an appropriate governance in a complex real world. Moreover, those actors, factors and institutions do not make sense on their own, they are given meaning through the networks they interact in and with. As such, “governance” should focus on the actors, the actor networks, and the contexts.

c From “government” to “Governance”? Which governance strategies can be distinguished?

The interplay of the orgware components, of actors and institutions, is the object of governance. Some of the aforementioned governance definitions are resumed below, as they represent various perspectives on governance; ranging from a planner’s perspective of steering, towards the notion of governance as a result, an emerging process. The definitions align with the conceptualisation of mobility as a CAS.

“Governance is understood as the result of the interaction of many actors who have their own particular problems, define goals and follow strategies to achieve them. Governance therefore also involves conflicting interests and struggle for dominance.”(Voss and Kemp 2006: 9)

“[...] the complex art of steering multiple agencies, institutions and systems that are both operationally autonomous from one another and structurally coupled through various forms of reciprocal interdependence.” (Jessop 1997: 111).

“Governance is a social function centred on steering collective behaviour toward desired outcomes and away from undesirable outcomes.” (Young 2017: 26)

With respect to the position and role of governments in such governance, we observed that governance approaches ranged from a strongly top-down centred “government” in the public administration paradigm (70’s and 80’s), to a free market oriented new management paradigm (90’s). Since the top-down approach did not always deliver the desired results, governing inclined towards the other extreme; the free market principle. The associated co-production concept was seized as an opportunity for PPS. But, the predominant co-production concept of that era soon eroded to managerial contracting practices, and became a shadow of the strategic partnership between public and private it once had envisioned. From 2000 onwards, hopes were pinned on a combination of both in the new public governance paradigm. However, the interpretation and reputation of co-production was restored. But, as this approach appeared very time-consuming, it soon drifted off from real co-production to only involving the vested actors. In addition, those planning approaches still focus on working towards a fixed goal, though oriented on the longer term. This fixed goal is a concept difficult to materialise when acknowledging the complex nature of the real world. Striving for a fixed goal does not take into account the self-organising processes by actor networking associations. Those processes are at the basis of how actor networks come into

existence, and how actors influence and are influenced by their environment and institutional setting (cf. chapter 2.2). As an answer, affected by complexity theories, the reflexive governance, transition management, and evolutionary governance theory were developed, adding co-evolutionary aspects to governance. They conceptualised how governance arrangements could change or (co-)evolve over time. When combining those former perspectives with the new one, one can come up with a matrix of four governance approaches. They can be differentiated according to the way they perceive the actor field and setting cf. in Figure 95. That specific co-evolutionary approach is of interest for our complexity embracing orgware agenda for mobility.

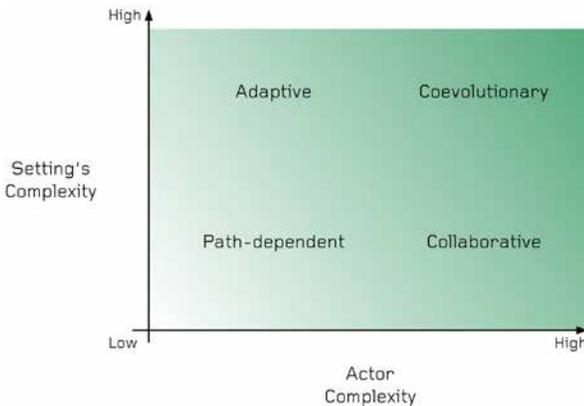


Figure 95 Four approaches on the governance of complexity with respect to actors and setting. Source: based on Hertogh and Westerveld (2010: 228, figure 5.9) as in Boelens (2015: 201).

d Governing the complex adaptive system of mobility: a two-tiers challenge

How did we merge the complexity perspective guided by self-organisation, co-evolution, and emergence of actor network associations and their institutionalisations with governance? We adopted the concept of structural couplings (Luhmann 1997). The actor networks may not allow to be steered directly, but their interplay, their coordination and alignment may leave room for indirect control. For this CAS context, we propose a co-evolutionary orgware agenda, which aims at realising or facilitating two main objectives. First, governance should intervene in the subsystems and its actor networks from the inside, so that structural couplings and alliances can be forged. Second, from an external perspective, governance can shape the necessary conditions to allow these structural couplings to happen, to broaden the solution space. We are not only interested in the actors or the conditions, but also in their interactions. Those interactions relate to the actor's or subsystem's governance paths. These two steps were covered in our case study analysis. Governance answers to mobility issues were screened and examined with respect to the rise of structural couplings within the dynamic translating actor networks. Afterwards, we tried to identify the conditions and where they opened up for co-evolutionary change.

e What do real world governance case studies learn us about governing complexity?

A multiple case study analysis was carried out, to see where mobility governance stands today with respect to acknowledging complexity and adapting the orgware. Evidence to answer this subquestion was gathered from mostly Flemish mobility governance case studies. Cases were selected from two major developing governance processes and formal institutional changes over the last decade: the upcoming regional intergovernmental mobility cooperation, and the planning and implementation of large infrastructure projects. Data sources for reconstructing the governance processes comprised source analysis, interviews, focus groups, and an ethnographic observation.

Regional mobility cooperation in the southeast of Antwerp and in the region of Mechelen

In the chapter on regional mobility cooperation, two subcases were focused on: the SLUIZO/MOZO case in the southeast of Antwerp, and the intergovernmental cooperation in the region of Mechelen by the Cooperation Accessible Region (C-AR) and later by the transport region Mechelen. Those cases are connected in the sense that the initiative for the C-AR in Mechelen stemmed from interest in such intergovernmental cooperation or platform, that in turn instigated the selection of the region around Mechelen as pilot transport region.

Unravelling the case specific orgware, and thus the actor networks of those cases, shows that both cases are raised from the bottom up, from the municipalities. They tell the actor network story of mostly vested public mobility actors involved in the transport and traffic market, including amongst others the municipalities, the Flemish administrations (AWV and MOW), the public transport providers (De Lijn and NMBS), the province, etc.

In both cases, the actors associated because of a shared objective, tackling inter-municipal mobility problems, e.g. the perceived transit traffic in the southeast of Antwerp, or the call for a shared vision of mobility in the region of Mechelen. Those initiatives were answered by a top down intervention, shaping an intermediary platform to address the raised issues.

In Antwerp, this top-down answer did not appeal to all of the participating municipalities, and the interest gradually dropped. Important to know is that the real mobility problem in the area was attributed to internal displacements, and not necessarily transit traffic. As a consequence, no infrastructure measures, but rather intergovernmental cooperation (a MOZO platform) was proposed as solution, to the discontent of many municipalities. As such, the actor network fell apart, and no further engagements were specified.

In Mechelen, IGEMO the intercommunal in the region around Mechelen started the initiative for a regional collaboration for, amongst other fields, the field of mobility, after the idea arose on several consecutive conferences of mayors. The existence of this cooperative spirit played a major role in the later selection of the region of Mechelen as a pilot transport region. As the obligatory passage point to start cooperating was already dealt with in the C-AR. However, we could observe that the top-down answer, i.e. the transport region Mechelen, somewhat put or even

the dynamics of the bottom up initiative on hold, though both actor networks cover more or less the same actors. The C-AR was redefined to fit the arrangements of the transport region, but many aspects of the initial C-AR pillars therewith had lost attention or were postponed in anticipation of the necessary financial means (e.g. marketplace for mobility, participatory approach, etc.); those means went to the transport region. In the case of Mechelen, one had learned from the SLUIZO/MOZO experience, that with political support and institutional anchoring the chances of success increase. Indeed, in contrast to the case of SLUIZO/MOZO where the initiating municipalities did not have a further role in the decision-making process after the study process, in Mechelen, the municipalities stayed involved as they got a seat in the transport region council, the new mobility policy level (in the making cf. “pilot”).

In the case of Mechelen, some lessons were learned from the SLUIZO/MOZO experience. For instance, it was acknowledged that by politically anchoring the actor network in the mobility decision-making process, and by expressing engagements and specifying financial contributions, the chances of success were increased. Although the political involvement can be beneficial, sometimes, when nearing elections, that political influence can interfere with the translation of the actor networks and their institutionalisation process. For instance, in the case of Mechelen, the transport region council postponed the final approval of the inter-regional transport plan till after the elections. Even the final constellation of municipalities in this region can still change. As such, while the political support or backing proves to be important and is an enabling factor, adding the political layer can also be constraining, as by adding politics the cooperations can lose vigour.

The transport region Mechelen adopted a rather adaptive governance approach as it started from exploring future options for a changing setting within a relatively stable actor field; different public transport scenarios were particularly focused on answering the very specific travel demand in the future.

In both cases the mediators that had to manoeuvre for the necessary structural couplings came from the public sphere. In the SLUIZO/MOZO case, after the study was carried out, the deputy Verhaert and F. Leys, an official from the DMOW, had to launch and sustain the platform, but the actor network was non-existing anymore. In the case of the C-AR, IGEMO functioned as the first mediator, but then it was taken over by the chairman of the transport region council G. Vaganée and F. Leys.

Regional mobility cooperation from an entrepreneurial perspective: the VO in Rotterdam

The Verkeersonderneming in Rotterdam is a case that also deals with regional mobility governance but from an entrepreneurial perspective. Although this initiative also stemmed from the realm of public actors, the adopted governance approach is rather business-oriented. The approach gave rise to a new sector; it addressed mobility service providers to overcome the accessibility challenges in the region of Rotterdam.

The VO has been established to anticipate and counteract the traffic congestion that was expected during the planned major road works at the A15 in Rotterdam. As none of the existing authorities knew well how to keep the region accessible, a new cooperation, with a mix of external people and people from the authorities,

had to think of new ways to deal with these challenges. In addition, a political momentum, enabled the actual setup of the VO as a new cooperation. Soon, the focus was on targeting people and employers, and on activating a new third party: the marketplace for mobility was born. Though the VO was sometimes considered a new public party, the organisation can distinguish itself from ordinary public cooperations through its creativity, flexibility, and efficiency. Political interference was limited to the programme level (priorities and values for the region), while the elaboration of that programme and reaching the targets was left entirely to the VO itself. Furthermore, projects were frequently delegated back to the different parent organisations and officials were often exchanged from the VO to the parents, or the other way around. *Dare and do what the other parties cannot or dare not do* was the motto.

The actor network diagrams display the VO in the middle of the network, placed next to its parents. The VO could integrate a diverse range of actors in its actor network, ranging from citizens and business actors, to knowledge institutions and other public actors. Specific programmes and projects were initiated to target specific actor networks (e.g. “Wild! van de spits” campaign to address car commuters and citizens, or the employers approaches targeting the business sector in the region. The latter nodes would represent actor networks themselves if we had more time and a more specific scope of analysis.

Thanks to the successful “peak avoidances”- approach, the VO increasingly built legitimacy and got its orgware approach institutionalised. The popularity of an orgware approach and the implementation of “smart measures” (optimising capacity and creating alternatives) can be attributed to the economic climate at that time; an economic climate that did not allow for many costly infrastructural measures (neither hardware, nor software). As such, the VO could increasingly mobilise more means, not only from the parent organisations but also from the national level. After the first years, the VO was given the opportunity to carry out the national consecutive BB-programmes for the region Rotterdam, and this approach was anchored in the future spatial planning and mobility institutional framework (BO MIRT) for the region (between the national level and the provinces).

This institutionalisation changed the VO, as it had to adapt its working methods and its organisation to the needs of the various programmes to carry out. The hardware and software interventions carried out by the partners, were always combined with an orgware approach by the VO. With the VO as a cooperating partner, consistency was created in the mobility policy and all subsystems of the complex adaptive mobility system were utilised and addressed appropriately in search for a more sustainable and accessible region.

The VO is the result of a co-evolutionary governance strategy followed by the parent organisations to adapt to a dynamic and volatile institutional setting and to address a dynamic actor field in a quest to keep the region accessible.

The mediators that facilitated the establishment of the VO were the director of the Port Authority and the Minister. Though less known by the ordinary citizens, the managing director of the VO plays an important role as well, to navigate between politics and practice, and to pursue an innovative path that sometimes encounters opposition. Furthermore, the people I spoke with took a central role as well, as they ensured the necessary cross-overs with the parent organisations on a regular basis, they defended the orgware approach where necessary in their “home base”.

They also manoeuvred the necessary structural couplings between the parents organisations.

Case study of the LIP Oosterweel Link

During the LIP Oosterweel link, the orgware changed drastically, thanks to the interplay of diverse actors with each other and with their institutional framework. The adopted governance strategies ranged from a strongly top-down oriented technocratic planning approach in the first project years, to a collaborative approach in the last two years, and even towards the inclusion of a cautious co-evolutionary layer after the settlement of the Future Covenant.

Like in the other case studies, this case started as an infrastructure story too. The infrastructural solutions were already suggested, even before a broader problem definition and scope had been considered appropriately. This illustrates the prevailing path dependent planning approach at that time. Later, under the influence of various citizens movements and knowledge evolutions adapting the institutional framework, various additional themes were added to the project, such as liveability and impact on the city and air quality. By using the translation rounds to reconstruct the case story, we wanted to draw attention to the multi-layered and increasingly complex character of the case. Although the earlier citizen movements had already opted for a capping of the ring road, the capping story was brought to life by the Ringland movement a few years later. They mastered the various media channels, they adapted their communication strategy, and they provided the knowledge with crowdfunded scientific studies. As such, they increasingly gained support from citizens, academics, business actors, and politics. They have catalysed the new dynamics necessary to break free from the locked-in LIP planning process.

While the two main actor networks in the case, respectively the governmental side “versus” the citizens movements, both grew, it was only with the Ringland movement that interconnections were established between the two. This also characterises the process that went from a conflict model to a collaborative model. Later, the intendant adopted a central position between both “sides” and structurally coupled both actor networks, which was anchored in the Future Covenant.

The various governance approaches that were adopted over the years each had their own exponents or mediators. While Camiel Paulus was the mediator of the path-dependent strategy in the early years of the large infrastructure project, this role was taken over by Cathy Berx (Poort Oost) adopting a rather collaborative strategy in a later phase. But the process got even more collaborative by Ringland (informal collaborations), and later by the intendant (informal and formal). Perhaps, the intendant has touched upon a co-evolutionary strategy, as he could gradually gain the trust of all parties in the project and he could widen his mandate. The actors were on speaking terms again and a settlement could be reached between the protagonists (Future Covenant). Even the pending legal disputes were cleared, as the urgency to act was omnipresent. To connect with the ordinary citizen he

relied on the collaborative techniques of research by design and organised several intensive rounds of citizen engagement in the project on different moments in the planning of the capping projects (*Ringdagen*). This gave the citizens the tools they needed to become involved with the mobility and spatial planning matter in their region.

In our opinion it is no coincidence that the most successful mediators in the story have an urban planning background (e.g. Ringland and the intendant); the interdisciplinary character and the eye for the creation of an imaginary is something that is in the nature of spatial planners, more than in the nature of others.

Insights were offered by the Curieuzeneuzen citizen science project

The Curieuzeneuzen citizen science project was launched by the Ringland Academy, a think tank within the Ringland movement to measure the traffic-related air quality in Antwerp. The project not only focused on collecting data of a high scientific quality, but also on involving citizens, and raising awareness in general, and on the adoption of the results by policy-makers. The project succeeded in mastering those objectives, and this brought the air quality issue to an even higher level on the policy agenda.

How does the citizen science project relate to our dual challenge? On the one hand, the project created structural couplings between the city and the citizen movements, as the city even became a (financial) partner of the project in addition to other universities. On the other hand, it provided the necessary institutional anchoring for the project, but also from a general perspective, for the engagement of citizens. It has further strengthened the legitimacy of the Ringland Academy and of the Ringland movement. Curieuzeneuzen functioned as a stepping stone to a more co-evolutionary governance track within the larger mobility debate in Antwerp and in the LIP Oosterweel Link.

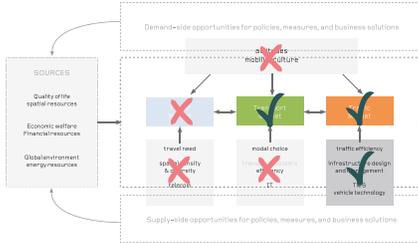
It is no coincidence that the Curieuzeneuzen project focused on air quality, as the average citizen often only has an anecdotal knowledge of the subject. Participation in such a project can therefore not only increase the individual scientific knowledge, but also render the environmental sciences more democratic on a larger scale; air quality and the associated quality of life aspects and environmental quality thus become a matter for everyone. The project gives the average citizen the tools to form a more well-founded opinion about measures that the city or, by extension, other authorities are taking or want to take, while at the same time calling their own behaviour into question.

The Ringland Academy and the results of the Curieuzeneuzen project provided the necessary means to have a proper debate on air quality. A debate that is strongly linked to the mobility and spatial planning debate in Antwerp. Furthermore, it brought the citizen movements, the city of Antwerp and the Flemish Government together to act now.

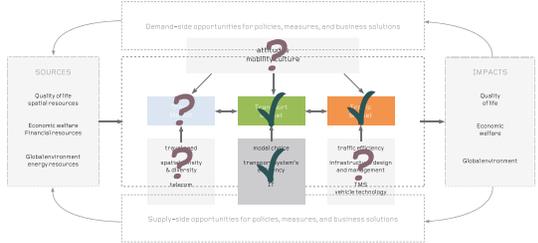
The practical added value is demonstrated first of all by the fact that the high-resolution Curieuzeneuzen air quality data gave a more refined picture of the difference in air quality between the streets themselves, and that the air quality models that are generally used as a basis for policy decisions need to be refined or adjusted. After all, the air quality has been effectively measured, where policy has always been based on air quality values generated by models based on only a

few effectively measured values. Secondly, the CurieuzeNeuzen air quality data has been adopted by the city as its reference base for testing the impact of future measures, e.g. the effect of the introduction of the low emission zone in Antwerp. Thirdly, the participation in such a project also has an impact on the participants, e.g. a change of attitude towards policy measures, but also regarding the mobility behaviour, etc. As such, “planning” moves beyond the plan and comes closer to the citizens again, the people we are eventually planning for.

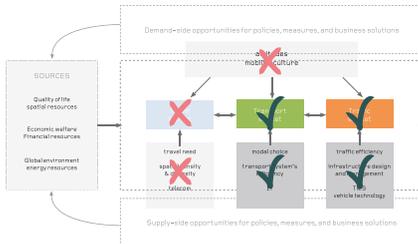
a) MOZO



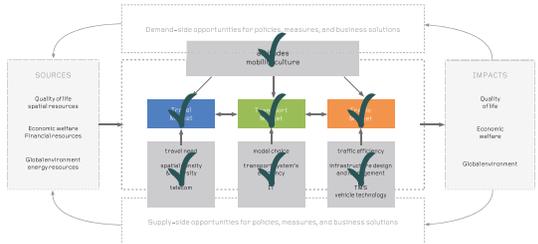
b) C-AR Mechelen



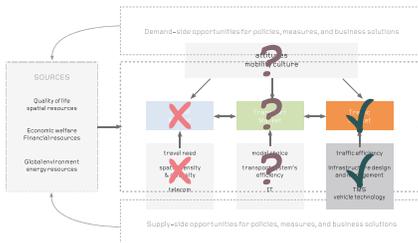
c) Transport region Mechelen



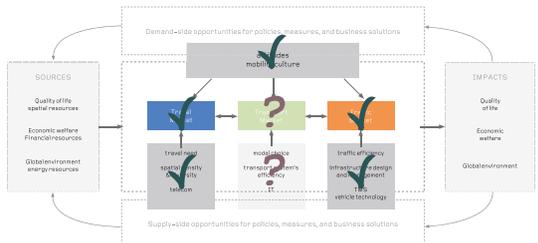
d) The VO (Rotterdam)



e) OWL by BAM



f) by citizen movements



g) OWL after intertant

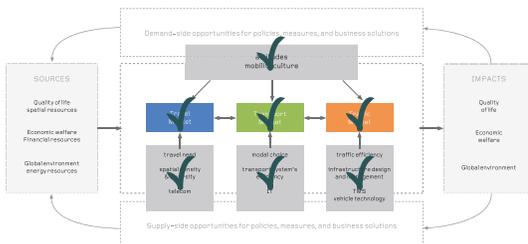


Figure 96 Summary of the cases' orgware .

9.2

The two-tiers challenge for the orgware

To cope with the encountered complexity in the mobility transition our theoretical framework was centred around the challenge to connect the actor networks and the subsystems, and to create the necessary conditions that stimulate or activate those connections. We kept this twofold challenge in mind while reconstructing several mobility governance case studies to gather in-depth information on the specific governance solutions that were established. What were the outcomes? Did they succeed? Who were the mediators in the story? We have searched the cross-case patterns, similarities and dissimilarities, barriers and opportunities to formulate an orgware agenda for mobility governance. In this part of the conclusions we will elaborate on those findings and observations as stepping stone towards our policy reflections. Although we will first elaborate on the manoeuvring for structural couplings and afterwards on the institutions, there are many overlaps between the two.

9.2.1

Manoeuvring for structural couplings

During this research, we observed that the traffic market is the engine of the complex adaptive mobility system (Figure 96); it is the arena from which many governance stories start. Hardware and software fixes, especially in the traffic market (traffic infrastructure and traffic management) are the most common and most popular solutions to mobility problems. Moreover, it is easier to find stakeholders and mobilise partnerships around hardware and software interventions, than around less tangible orgware measures, the output of which is not directly visible in the field. The coordination and integration with other policy areas, or thus considering mobility as a CAS that comprises more than just the traffic market, remains rare in Flanders. This is often illustrated by a hasty problem definition phase in the planning process.

Various cases show that an infrastructural solution was formulated and discussed even before an in-depth problem analysis had been conducted, revealing the structural basis of the problem and exploring possible synergies with other policy areas. This can lead to actors associating in partnerships for specific opportunistic reasons (cf. SLUIZO/MOZO), or can lead to a growing opposition to the project (cf. Oosterweel project). However, in the case of Rotterdam, the infrastructural bottlenecks served as the catalyst for a more structural orgware approach (the VO), that still exists and continues to grow, even after a decade. The orgware of the Oosterweel Link project also changed over the years. Especially during the last years, the dynamic actor field and opposition to the project was answered by the appointment of an intendant, as mediator to reconnect the actors and to look for convergence. Furthermore, the citizen movements became the protagonists of the planning scene. They got themselves into the decision-making process, and even changed the course of future mobility planning in the region of Antwerp; they were involved in the transport region Antwerp.

From the de- or reconstruction of the actor networks we could observe some patterns with respect to who the initiating actors were and which the resulting dynamics were from other actors in the network.

Only in the case of the VO, the initiative for a fundamental orgware shift was launched by the “regime” public actors themselves. Because they saw challenges that fell outside their own field of competence (behavioural change campaigns, setting up an marketplace for mobility, etc.). In the other studied cases, the initiative for a governance change came from the bottom-up (“niches”). Both in the SLUIZO/MOZO case, and in the case of regional cooperation for mobility in Mechelen (C-AR/transport region Mechelen), the cooperation was instigated by the local authorities (public actors). In the case of the large infrastructure project (LIP) of the Oosterweel Link, the most important incentive for change was manoeuvred by the citizen movements (Ringland, Ademloos and stRaten-generaal).

Often, in response to those bottom-up initiatives, a top-down answer was formulated by the regime actors (governments): the MOZO platform as a response to the SLUIZO study results, the transport region pilot Mechelen as response to the C-AR initiative, and the appointment of an intendant in the Oosterweel Link project as an answer to the opposing actor network of the citizen movements. This clearly shows that the path dependent, or at best adaptive and collaborative strategies prevail in mobility planning; there is no sign of adopting a co-evolutionary approach in general. It seems difficult for governmental actors to leave more autonomy to the planning process and the involved actors; they somehow want to keep control or be in charge. As such, initiatives that rose from the bottom-up were responded to or taken over by the top-down. This top-down story was not always fruitful, nor in line with the initiators’ proposal (cf. SLUIZO versus MOZO, and IGEMO and C-AR versus the transport region Mechelen). In the case studies, this is often the point where the stories hampered or even ended, except for the Oosterweel Link case, where the intendant ultimately fostered a strategy that can cautiously be considered as co-evolutionary.

For instance, the municipalities in the southeast of Antwerp were not awaiting extra studies or a governance platform. They engaged in the cooperation because they wanted infrastructural measures to tackle the perceived transit traffic problem. When the oversaturated road network and not the transit traffic appeared to be the actual mobility problem in the region (high car-dependency), the reason and the momentum to cooperate was lost. Moreover, the approaching elections also played to the detriment of the MOZO platform, that could not prove its usefulness with tangible results. But whereas the municipalities did not get the opportunity to get involved in the Masterplan of Antwerp before (cf. MOZO), they recently got incorporated in the transport region of Antwerp where they can take part in the decision-making process and in the mobility discussions.

In Mechelen, the bottom-up C-AR partnership, that was at the basis of the selection of Mechelen as a pilot transport region, was redefined in correspondence with the transport region. But in fact, most of the initiatives and projects under the C-AR umbrella were simply put on hold or are awaiting subsidies: the marketplace for mobility, the communication and participation programme for the region, etc. Thanks to the input and cooperative climate in Mechelen, the transport region of Mechelen was able to take a quick start. But like most pilot transport regions, several actors mentioned that also the transport region Mechelen was held up

by election fever. The regional transport plan will not be approved until the next legislature, and so the regional mobility plan will have to wait. Moreover, many changes have occurred from the start of the pilot up until now, and the region has not yet taken its final shape, as various municipalities still have the opportunity to change to neighbouring transport regions.

In our research we could identify the four governance extremes, each with their own specificities (recall the matrix of governance strategies): the path-dependent, the adaptive, the collaborative and the co-evolutionary. In the chapter on regional cooperation an adaptive governance strategy was adopted, focusing on the challenges of a changing setting and thinking about future scenario's to deal with those challenges within a relatively stable actor field. In the chapter on the entrepreneurial regional cooperation illustrated by the VO, we identified a co-evolutionary governance approach, as it accounted for a dynamic actor field and a dynamic institutional setting. In the case of the LIP Oosterweel Link, the identified strategies ranged from strongly path-dependent in the first years, with a focus on implementing the plan, not accounting for much dynamics regarding neither actor field, nor institutional setting, towards a collaborative strategy, focused on aligning the dynamic actor field within a relatively stable context, towards a co-evolutionary strategy focused on grasping the complexity offered by both the actor field and the institutional context. Those strategies do not exhibit a kind of ranking from inferior to best, but rather tell us something about the perceived main challenges the actors encounter or want to address. In the case of the Oosterweel link, several strategies were pursued, but none of the first did work out well, so the strategies changed during the project process.

In the cases, the path dependent, adaptive, and collaborative governance strategies prevailed. They focused on adapting to a changing setting, and, in absence of engaged niche actors, often only involved the vested actors so that the vested interests were catered for. The actor network constellations thus consisted of public actors in most cases. Only in the case of the VO and in the later phases of the Oosterweel Link project, other actors joined the scene (business, civil, or knowledge actors). Since these other actors are often not merely situated in the traffic market, but usually in the travel market (citizen movement focusing on quality of life aspects) or transport market (such as new service providers generating alternatives for cars), the scope for finding solutions increased by involving them. The solutions also became more robust and more broadly supported than would have been the case if only established actors in the traffic market were to develop a solution.

When overlooking all cases, many mediators or navigators could be identified who were all looking for structural couplings of actor networks to reach their objective. They ranged from public actors to citizen movements and knowledge actors and their approaches or manoeuvres did not all have the same result; some were more successful than others. We spend a few words on their similarities and dissimilarities.

They were all considered more neutral to some extent than the other actors in the actor network; more neutral as in that they could transcend their own local interests and think about a programme for the whole region or project. In this respect, for instance, the provincial level has entered the planning scene as the in between

level; governors are considered more neutral and are often, also in fields other than mobility, consulted as neutral party between municipalities and the regional government. Moreover, the provincial deputies can sometimes mediate or bridge the gap between municipalities and higher authorities. Sometimes, other even more external people became navigators in the complex actor networks.

In the Oosterweel Link project, governor Paulus is a good example of such mediator, he organised a States General to acquire the necessary support base and he was very devoted to the implementation of the project. Later, governor Berx was given the role as mediator (Poort Oost). Later in the process, an external intendant was the neutral person in between the actor networks, as the governments themselves were already too involved.

In the SLUIZO/MOZO case the mediator was provincial deputy Verhaert. She got involved when the actor network was already gradually dissipating. In the case of Mechelen, the first mediators were part of the intercommunal IGEMO, but they missed this higher escalation level, as the municipalities are their main clients. This was identified as a challenging position in this research. Later, in the transport region Mechelen, the mediators and chairmen of the transport region council were a higher level official (DMOW) and a progressive mayor.

In the case of Rotterdam, the first mediators were the port authority and the minister, who shared a connection on the higher scale level as well and made the VO come alive. Afterwards, the consecutive directors of the VO were appointed from the this higher scale level as well, they were top officials from Rijkswaterstaat; they always had a connection with the ministry, so they had some neutrality towards the other rather regional actors and parent organisations. But they kept their own focus and objectives, they each brought their own expertise and connections to the VO network.

In the cases that showed most successful outcomes, the mediators actively changed the governance course and tried to create the right conditions to make the ultimate connections. They not only identified the opportunities, but also added value to the process, a value that specifically stemmed from their capacity, which they actively manoeuvred into the process.

The VO used a co-evolutionary strategy to keep the region accessible, a challenge that the parent organisations by themselves did not know how to face. The VO created the conditions for new mobility suppliers to join the marketplace for mobility and seduce people to take other travel modes than the car.

In the case of the Oosterweel Link, the intendant gained the trust of all parties and gradually broadened his mandate, and the institutional framework for the project and future projects. He shifted the approach from collaborative towards co-evolutionary and introduced research by design to materialise new solutions and gain a support base among the Antwerp citizens. The mediators in the other studied cases did not (yet) manoeuvre this kind of added value into the process, and could therefore rather be considered as intermediaries that facilitate the process rather than as mediators (Latour 2005).

9.2.2

Situational condition planning to open up for structural couplings

In this part we focus on the influence of the institutional framework on the actors and governance possibilities or breakthroughs. Were there institutional changes that stimulated structural couplings between actors? Why could some actor networks institutionalise their objectives or programme, while others could not? We return to the major governance processes these cases embodied: inter-municipal and intergovernmental cooperation for mobility and coping with large infrastructure projects.

What at first seemed situational governance initiatives, i.e. specific for a particular place and time, such as inter-municipal or regional cooperation for mobility, were suddenly referred to as “pilots”, implying the possible implementation elsewhere in Flanders. Illustrative of this are the SLUIZO/MOZO case story and the case of the pilot transport regions. As a result the outcomes increasingly resemble generic approaches, albeit with the possibility to make adjustments here and there. Except for the pilot transport region Antwerp, the pilot transport regions did not turn the generic basis into a mixed and integrated organisational structure and actor field. In Mechelen, for instance, hardly any citizen movements or civil society organisations were structurally involved in drawing the public transport policy. As such, though the institutional framework is adjusted to enable the involvement of citizen movements or business sector actors, the translation to the practice lags behind.

Moreover, the final demarcation of the transport regions, regarding which municipalities participate in which transport regions, appears to be not that simple. As after two years of piloting, some municipalities have not yet made their final decision. When the pilot in Mechelen started, 18 municipalities participated in the transport region Mechelen. Whereas at the end of 2017, only 14 municipalities remained and even that is probably not the final constellation, as some further shifts are considered possible. One might wonder whether a new and fixed level of cooperation, i.e. that of the transport regions, allows to be applied everywhere; just think of the Dutch experience and abolition of the transport regions apart from the city regions Amsterdam and Rotterdam-The Hague.

Although Mechelen demonstrated with the C-AR that the region desired to be and could be a pilot for inter-municipal mobility cooperation, the final demarcation seems to be a difficult task. Isn't the search for the final, rigid demarcations fooling the transport regions?

Besides, working towards a plan or vision is still central. For example, the transport regions are committing themselves to draw up a transport plan (considering public transport), which will later lead to the elaboration and approval of a mobility plan (considering all modes). However, many objectives other than drawing up these plans are not being put into practice. As such, the plan bears a serious weight: it is the crystallisation of the transport region approach for the coming years. Consequently, the political interference in the drawing up of the plan is high and nearing elections are slowing down the process; in most of the pilots the approval of the plan is postponed until after the elections.

The decree on complex projects focused on streamlining the various legal procedures and impact assessments, which used to run a separate course. It also shifted the emphasis from a path-dependent to a co-production or collaborative governance process. Although the Oosterweel project did not follow this much more recent complex project procedure, we could reflect on the strengths and weaknesses experienced in the Oosterweel Link project and refer to the answer proposed by the complex approach. The route planner provided a streamlined trajectory in which participation and communication are paramount throughout the process, both in formal and informal way.

First, as one of its basic principles, the decree mentioned the solution-oriented cooperation between all actors. However, it is not specified who these actors could be, which mix of actors is to be pursued, nor how structurally they should be involved in the story. Hence, the translation into the practice appeared difficult. The Oosterweel Link case study shows that mainly the established public actors took control of the process management and the communication from the beginning. The project history was characterised by a technocratic shielded process, resulting in an ever-increasing opposition. The moment that the lead or process came into the hands of a third, more neutral party, the intendant, one could work towards an agreement in the dossier.

Second, another important evolution in the complex approach is the emphasis on a transparent communication and participation from the beginning. This is crucial to gather support for the project and it is difficult to catch up with in the middle of the planning process. **Third**, the complex projects approach procedure does not allow to rush the problem definition phase.

In the LIP Oosterweel Link, the infrastructural solution seemed to be sealed even before the problem had been properly analysed. The citizen movements demanded more transparency and a proper communication about the project. Since they did not get the impression that their claims were taken seriously in the process, time and again new issues such as quality of life or environmental aspects came up that generated new rounds of opposition, causing the actor networks to rearrange themselves in an increasingly complex project. Therefore, the complex approach calculated sufficient time to define the problem and to analyse the alternatives. The decision on the final project is postponed until the project has reached maturity in the development phase.

While several improvements have been made with the new approach, coping with the dynamic actor field remains a severe challenge in our opinion, as apart from the intensive participation trajectory, the translation into practice is not guaranteed. Therefore, we recommend the approach to look for the necessary structural couplings with other actor networks and policy domains, so that cross-mobility market strategic partnerships between public, business, civil and knowledge sectors arise that can answer future rounds of opposition and broaden the solution space.

However, since most complex projects are only in the first and rather exploratory stage, in which final choices have yet to be made, not much of such resistance has yet been encountered. We will have to wait till the first projects reach the final stage to see how fruitful the complex projects approach really is.

Our research showed that some institutional adaptations have indeed evolved and made some improvements regarding the encountered complexity. But, it is not because the institutional framework is set, that the desired translation into practice is automatically made. This translation could benefit some further evaluation and reflection. This shows that both governance challenges are linked to one another: the conditions can be set, but you still need to activate the actors, get them *interested* in the project or process, and that is where the mediator or navigator comes into play (Boonstra 2015).

Furthermore, by reconstructing the actor networks and their translation phases, it became increasingly clear that governance does not end with the approval of a plan or by having the objectives institutionalised. A continuous renewal must be strived for to demonstrate the legitimacy of the orgware approach or governance time and again; the translation phases started over and over again. "Moving beyond the mobility or transport plan", proved to be an important ingredient for success; the respective approaches gained legitimacy by building towards solutions from a much broader perspective, addressing all components of the CAS of mobility: the actors and their institutional framework (habits, behaviours, rules, etc.).

The VO, for instance, concentrated on realising a specific target: generating peak avoidances in a creative way and experiment with Mobility as a Service; all kinds of activities which the parent organisations are not at all familiar with. The partnership statement has been rewritten several times in function of the changing needs posed by the parent organisations and by the changing mobility challenges in Rotterdam. Besides, the VO was even established to be a temporary organisation initially, so its longevity is far from guaranteed. As long as the VO remains a significant and creative party in tackling the mobility issues in the region, it will continue to exist. The parent organisations themselves, including the port authority, the municipality, the transport region and Rijkswaterstaat, already covered the three mobility markets. As such, the scope for innovative and robust solutions was maximised by the VO. The behavioural pillar and the creation of more alternatives and more in-depth cooperation with the actors in the various markets was integrated by the VO. By setting up reward projects, an employer- and employee approach, starting a marketplace for mobility, etc. they went beyond drawing a plan. Instead, the VO reinvented itself time and again. They managed to include all the necessary subsystems of the entire mobility system, with only minimal adaptations to the parent organisations or institutional context. In fact, they did not want to replace any single entity that had proven its worth, they just added the necessary creativity to find new solutions. As they set specific quantitative and qualitative targets (numbers of persons reached, number of peak avoidances, etc.), they were able to monitor and illustrate their progress and silence the opposition to their approach. Especially for governance approaches, a lack of evidence or progress was often enough to start questioning the approach.

Ringland also took a step beyond the plan (realising Ringland, i.e. the land on top of the ring road) and expanded its role. Apart from being a citizen movement they soon also incorporated the role of knowledge accumulator or knowledge exchange platform. Additionally, they even became a participant in the decision-making process (agreed upon in the 'Future Covenant') they rendered the air quality issue more democratic (CurieuzeNeuzen citizen science project). From an actor relational approach perspective, we can say that the Ringland Academy, and thus the Ringland

actor network, went beyond institutionalising; beyond the Future Covenant. They took the initiative beyond the plan, and planted seeds for the development of a regime and even a democratic anchoring (ARA), by engaging in a strategic partnership with the public and knowledge actors, to let the citizens measure the ambient air quality in the city of Antwerp; a role that is perhaps more likely to be expected from the governmental sides.

9.2.3

Policy suggestions and future avenues

At the end of this study, we would particularly like to point out that the adopted governance approaches have evolved, to fit the encountered complexity regarding the dynamic actor field or changing institutional context better. However, they are still rigid and often still oriented towards taming complexity, taking control, and looking for (relatively) generic solutions, rather than towards leaving more autonomy to the process and the actors themselves. Furthermore, involving a broad spectrum of diverse actors, aside from the vested ones, remains challenging but necessary. Only then coalitions can arise that seek solutions outside the hardware and software of the traffic market alone, and that find added value in many more domains.

Planners can make the difference in our opinion, as their role lies in the manoeuvring for the structural couplings that shape the actor networks. The role of the governmental actors lies particularly in the art of creating consistency; consistency between subsystems, rules, incentives, translations of the actor networks, etc. That does however not at all imply the search for one-size-fits-all solution. Well, on the contrary, situational approaches are to be adopted; solutions that are relevant in a specific setting, that span all mobility markets and look for synergies. Those approaches must not necessarily be long-term, as the dynamic actor networks will decide about that. Consequently one makes sure that progress and efficiency are not hampered, because every part of the complex adaptive system of mobility is activated and faces the same direction.

Another point we want to make is that it is difficult to measure governance outcomes. In response to that, it pays off to add a quantitative layer to the qualitative one again. This facilitates not only the monitoring of the made progress, but also helps to counter questions about efficiency and relevance of governance. Therefore, setting clear targets and communicating about them is a good way to overcome such problems.

Last but not least, as informed people make smarter choices, we see the merits or even necessity of readdressing the (ordinary) citizens again. We can gradually build towards the mobility transition from the bottom-up and the top-down by re-engaging with the citizens and by activating them in some way. In this respect, a citizen science project can be a catalyst for change, not only regarding the scientific knowledge and experience, but also regarding attitudes towards certain policy measures and regarding their own mobility behaviour. Also participatory research by design can enable the actors that are more difficult to reach to be activated, as they materialise the various layers of complexity and provide the necessary tools or the vocabulary to enter the (mobility) planning discussion.

9.3

Applicability of the theoretical framework: some reflections

The proposed framework, a combination of the actor network theory with its translation phases and the actor relational approach proved suitable to reconstruct the case stories. The composed framework gave us certain clues on the reasons why some orgware constellations were more successful than others. We took those theories as a starting point, because they allowed us to embrace a complex reality and start from the actors themselves. We did not aim for a holistic perspective on the cases, because we are aware of the limits of us as the observers. We are rather working towards a composite image; from interviews and documents we collect the case's actors, factors and their connections. Of course, by adding more interviews or documents, the resulting orgware diagrams could vary, they might become more stable and refine the previous diagrams⁸⁹.

The actor network theory, however, did not propose specific means or ways to visualise or materialise the actor networks. Something that we felt was necessary to make our orgware message clear. Especially for large and complex cases, in which the orgware is composed of many actors or factors and many interrelations, there was little guidance, nor was there previous work to take as starting point for our research. So, the moment we wanted to start gathering data in order to visualise the actor networks, we ran into several additional questions; not only issues regarding the necessary data, data sources, formats and software tools, but also regarding what these data would show us in the end. For instance, how large are actors displayed and what does that represent? What do the connections represent? Shouldn't the connections reflect a kind of intensity for instance by differentiating the thickness of the lines in the diagrams? Those kind of smaller "struggles" were dealt with during the first phases of our research, but were afterwards replaced by issues on the reproducibility of the research. Although we can never fully grasp the truth, as there are always actors or connections that can be added, and as there is always some influence of the observer analysing the case, we still wanted to come up with relatively solid materialisations of the orgware. That is why we based the visualisations on coded interviews or documents and why we settled for a social network analysis approach, so that visualisations are not hand-drawn by the observer and therefore do not favour one actor over another. Instead, based on the coded input, the actor network diagrams were generated by a social network analysis software package. The observer can then only play with additional attributes and see what happens with the diagrams.

After having arrived at a certain readable visualisation method, we came across cases with many actors, too many to allow a straightforward reading of the diagram – so issues of selection to enhance readability arose. In the end, we tried to come up with solutions to all of the encountered questions, but it would be nice to know how other researchers would tackle or would have tackled those issues.

⁸⁹ Except in case the added interviews or documents strongly diverge from previous insights. But this is not very likely if interviewees and documents are selected carefully so that they already cover and account for different perspectives

In the actor network visualisations the translation to the different arenas of the complex adaptive mobility system was less straightforward, as actors often engage in more than one arena and as we therefore did not see the added value of letting the arenas determine the place of actors in the network. But by looking at the kind of actors involved and the specific things in the institutional framework they addressed or wanted to change, the mobility CAS arenas that were targeted could still be distinguished. We found this translation necessary to keep the overview and to draw conclusions, because when visualising the actors networks, the overview is sometimes lost. Although the scheme might look a bit simplistic, it is not our intention to oversimplify the mobility system; the scheme enables us to keep the overview which is useful in combination with the more detailed reading of the cases that is offered by the actor network approach.

The importance of this translation or materialisation of the complexity was acknowledged in the panel discussion/round table that we organised with respect to governing large infrastructure projects, in particular on the Oosterweel Link. At first, I was very sceptical about my task during that panel discussion, namely introducing the key actors to their own story from a complexity and actor network perspective. I was only a toddler when the Oosterweel story began after all. So what would I have to tell those big men and women around the table? But bringing the story from another angle, the complexity and actor network angle to be precise, was much appreciated and did not only recollect the whole process, but also offered tools to start the discussion between the parties; it gave them the possibility to rethink the planning process and identify the important moments of divergence and convergence. It turned out to be the start for a fruitful discussion. We were convinced of the possibilities and the added value of translating, visualising or materialising the orgware and bringing the actor network theory alive.

Appendices

10

Appendix 1. Overview of the interviews and attended events per case

10.1

Case regional mobility cooperation

10.1.1 MOZO

| Date | Name | Organization & Function | Location & Time |
|------------------|---------------|---|---|
| 17/02/2015 | F. Leys | Mobility coordinator for the Antwerp region, Department for Mobility and Public Works of the Flemish Government | -- telephone interview (11h-12h) |
| 24/03/2017 | T. Wassenberg | Cabinet member of the former Minister of Mobility, K. Van Brempt, and later on municipal councillor in Antwerp | Café Royal, Central Station Antwerp (10h-12h) |
| 3/04/2017 | I. Verhaert | Former deputy for Mobility, Province of Antwerp, coordinator of MOZO - platform | Parkhuis, Koningin Elisabethlei 18, 2018 Antwerp (14h-15h) |
| regular feedback | D. Lauwers | Professor at the department of civil engineering, centre for mobility and spatial planning (Ghent University), mobility expert, quality manager and contact of the Arckus SLUIZO study assignment, co-supervising this dissertation | Afdeling Mobiliteit en Ruimtelijke Planning Sint- Pietersnieuwstraat 41 B2, 9000 Gent |

Table 7 Overview of the interviews for the MOZO case

Frank Leys

Mobility coordinator for the Antwerp region, Department for Mobility and Public Works of the Flemish government

- What is the MOZO platform with respect to origins, leading stakeholders, expectations, specific assignments, outcomes, etc. ?
- Related interview objectives and topics to be covered:
 - > Understanding the problems in the region
 - > Shed light on the actors and their claims that have led to the MOZO project
 - > Revealing opportunities and threats of the mobility platform
 - > Estimating the impact of the study and platform

Inga Verhaert

Former deputy for Mobility, province of Antwerp, coordinator of MOZO platform

- What is the MOZO platform with respect to origins, leading stakeholders, expectations, specific assignments, outcomes, etc. ?
- What was/is the role of the province not only in this specific process, but also more generally, with respect to regional cooperations?
Related interview objectives and topics to be covered:
 - > Understanding the problems in the region
 - > Shed light on the actors and their claims that have led to the MOZO project
 - > Revealing opportunities and threats of the mobility platform
 - > Estimating the impact of the study and platform
 - > Lessons learned from MOZO – the start of a new cooperation Noorderkempen

Toon Wassenberg

Cabinet member of the former Minister of Mobility, K. Van Brempt, and later on municipal councillor in Antwerp

- What is the MOZO platform with respect to origins, leading stakeholders, expectations, specific assignments, outcomes, etc. ?
- Can you elaborate on the political context of the SLUIZO/MOZO initiative?

Related interview objectives and topics to be covered:

- > Understanding the problems in the region
- > Shed light on the actors and their claims that have led to the MOZO project
- > Revealing opportunities and threats of the mobility platform
- > Estimating the impact of the study and platform

Dirk Lauwers

Expert, quality manager and contact of the Arckus SLUIZO study assignment, co-supervising this dissertation

- Regular feedback on the SLUIZO study process and establishing of the MOZO project with regard to most important stakeholders, roles and influence, outcomes, etc.

10.1.2 Regional mobility cooperation in Mechelen

| Date | Name | Organization & Function | Location & Time |
|---------------------|---|--|---|
| 17/11/2016 | W. Abels, W. Van Hoof, and P. De Bruyne | Mobility consultant at intercommunal IGEMO, Project manager at IGEMO, Director IGEMO | IGEMO, Schoutetstraat3, 2800 Mechelen (10h30-12h45) |
| regular feedback | D. Lauwers | Professor at the department of civil engineering, centre for mobility and spatial planning (Ghent University), mobility expert, supervisor of the scientific quality and ambitions of the C-AR project, co-supervising this dissertation | Afdeling Mobiliteit en Ruimtelijke Planning Sint- Pietersnieuwstraat 41 B2, 9000 Gent |
| 6/12/2016 | G. Vaganée | Mayor of Bonheiden and chairman of the transport region council Mechelen (Vervoerregioaad) | Town Hall, Jacques Morrensplein 10, 2820 Bonheiden (11h-12h30) |
| 19/12/2016 | F. Leys | Mobility coordinator for the Antwerp region, Department for Mobility and Public Works of the Flemish Government, and co-chair of the transport region council Mechelen (Vervoerregioaad) | Anna Bijnsgebouw, Lange Kievitstraat 111-113, 2018 Antwerp (9h30-11h) |
| 7/03/2018 | F. Boelaert | Secretary General Department for Mobility and Public Works of the Flemish Government, professor at the department of civil engineering, centre for mobility and spatial planning (Ghent University) | Afdeling Mobiliteit en Ruimtelijke Planning Sint- Pietersnieuwstraat 41 B2, 9000 Gent (9h-10h) |

Table 8 Overview of interviews conducted for the case regional mobility cooperation in Mechelen

Willem Abels – *Mobility consultant at intercommunal IGEMO*

Werner Van Hoof – *Project manager at IGEMO*

Peter De Bruyne – *Director IGEMO*

- What is the Cooperation Accessible Region (C-AR): origins, establishing process, leading stakeholders, expectations, specific assignments, current outcomes, future perspective, etc.?

Related interview objectives and topics to be covered:

- > Origins C-AR
- > Lessons learned from the MOZO case?
- > Role of the intercommunal IGEMO
- > Organisational structure and financial support
- > How does C-AR relate to upcoming transport region in same area?
- > Current state of affairs
- > Challenges, commitment and perception of C-AR versus transport region Mechelen
- > Future perspective

Dirk Lauwers

Mobility expert, supervisor of the scientific quality and ambitions of the C-AR project, co-supervising this dissertation

- › Regular feedback on the IGEMO study process and the establishment of the C-AR with regard to most important stakeholders, roles and influence, outcomes, etc.

Frank Leys

Mobility coordinator for the Antwerp region, Department for Mobility and Public Works of the Flemish government, and co-chair of the transport region council Mechelen (Vervoerregioraad)

- What is the Cooperation Accessible Region (C-AR): origins, establishing process, leading stakeholders, expectations, specific assignments, current outcomes, future perspective, etc.?
Related interview objectives and topics to be covered:
 - › Origins C-AR
 - › Lessons learned from the MOZO case?
 - › Role of the intercommunal IGEMO
 - › How does C-AR relate to upcoming transport region in same area?
- Can you elaborate on the general context of Basic Accessibility and the transport regions?
Related interview objectives and topics to be covered:
 - › Selection, setup and organisational structure of transport region Mechelen
 - › Communication and streamlining of the different initiatives
 - › Main focus and activities of the transport regions and the institutional adjustments
 - › Difference between objectives and output C-AR versus Transport region Mechelen
 - › Planned timing and evaluation of transport regions
 - › Transport region Antwerp, Limburg and Turnhout?
 - › Main challenges for the transport regions

Filip Boelaert

Secretary General Department for Mobility and Public Works of the Flemish Government, associate professor at the Department of Civil Engineering, Centre for Mobility and Spatial Planning, Ghent University

- Can you elaborate on the general context of Basic Accessibility and the transport region pilots?
Related interview objectives and topics to be covered:
 - › State of affairs, timing, evaluation, legal framework
 - › Role of civic society actors and citizen movements
 - › Main challenges and bottlenecks
 - › Financial aspects of the transport regions
 - › Alignment with regional development in spatial planning policy?
 - › Transport region Mechelen: state of affairs, organisational structure, timing, transport plan
 - › Transport region Antwerp: state of affairs, organisational structure, alignment and collaboration, role of the civic society actors and citizen movements, role of the city of Antwerp, transport region Antwerp in relation to the Slim Naar Antwerpen and marketplace for mobility

10.2

Case entrepreneurial mobility cooperation the VO

| Date | Name | Organization & Function | Location & Time |
|------------|----------------------------------|---|---|
| 18/04/2017 | A. Van der Bend, and W. Veeneman | Former director of De Verkeersonderneming Associated professor at TU Delft | De Bouwcampus, Van der Burghweg 1, 2628 CS Delft (14h-16h30) |
| 20/04/2017 | F. Bus, and N. Ammerlaan | Project manager Logistics at De Verkeersonderneming and the Port of Rotterdam Programme manager at Port of Rotterdam | World Port Center (WPC), Wilhelminakade 909, 3072 AP Rotterdam (14h-15h30) |
| 9/05/2017 | M. Oosterbaan | Advisor programme organisation Beter Benutten at the Ministry of Infrastructure and the Environment | -- skype interview -- (10h-11h) |
| 10/05/2017 | B. Postma | Former expert traffic and transport at the municipality of Rotterdam, former account holder in De Verkeersonderneming | Municipality of Rotterdam - Stadsontwikkeling, Wilhelminakade 179, 3072 AP Rotterdam, 7th Floor (14h-15h30) |
| 11/05/2017 | R. Boshouwers | Consultant urban smart mobility, former project manager mobility services at De Verkeersonderneming, project manager Marketplace for Mobility Antwerp | Rebel Rotterdam, Wijnhaven 23, 3011 WH Rotterdam (10h-11h30) |
| 24/05/2017 | H. Moors | Project director Blankenburg Link Rijkswaterstaat, director ad interim de Verkeersonderneming | Rijkswaterstaat Rotterdam, Boompjes 200, 3011 XD Rotterdam (10h30-11h30) |

Table 9 Overview interviews case De Verkeersonderneming

| Date | Name | Organization & Function | Location & Time |
|------------|---------------|---|--|
| 11/05/2017 | R. Boshouwers | Consultant urban smart mobility, former project manager mobility services at De Verkeersonderneming, project manager Marketplace for Mobility Antwerp | Rebel Rotterdam, Wijnhaven 23, 3011 WH Rotterdam (10h-11h30) |
| 2/06/2017 | M. De roeck | Director communication and participation and program manager 'Slim naar Antwerpen' at City of Antwerp, programme manager 'Slim naar Antwerpen', City of Antwerp, department for urban development (Stadsontwikkeling) | Francis Wellesplein 1, 2018 Antwerpen (13h-14h) |

Table 10 Overview of the interviews for the Marketplace for Mobility Antwerp

Aernoud Van der Bend – *Former director of De Verkeersonderneming*

Wijnand Veeneman – *Associated professor at TU Delft*

- What is De Verkeersonderneming (VO): origins, establishing process, leading stakeholders, expectations, specific assignments, current outcomes, future perspective, etc.?
Related interview objectives and topics to be covered:
 - > Institutional context and changes for mobility
 - > Organisational structure the VO and relation with parent organisations
 - > Specific activities of the VO and the Beter Benutten programme
 - > Challenges, opportunities and future perspective?

Frank Bus – *Project manager Logistics at De Verkeersonderneming and the Port of Rotterdam*

Nicolette Ammerlaan – *Programme manager at Port of Rotterdam*

- What is De Verkeersonderneming (VO): origins, establishing process, leading stakeholders, expectations, specific assignments, current outcomes, future perspective, etc.?
Related interview objectives and topics to be covered:
 - > Origins, perspectives and share of the port authority in the VO
 - > Organisational structure the VO and relation with parent organisations, from a port authority perspective.
 - > Specific activities and evolution of De Verkeersonderneming and the Beter Benutten programmes
 - > Challenges, opportunities and future perspective?

Marsha Oosterbaan

Advisor programme organisation Beter Benutten at the Ministry of Infrastructure and the Environment

- What is the Beter Benutten (BB) programme: origins, stakeholders, expectations, specific assignments, current outcomes, future perspective, etc.?
Related interview objectives and topics to be covered:
 - > Origins and institutional context of the BB programme
 - > Content, organisation and focal points of the programme
 - > Programme implementation and regional differences
 - > BB in relation to the region of Rotterdam and the VO
 - > Future of BB
 - > the VO from the ministry's perspective

Bertus Postma

Former expert traffic and transport at the municipality of Rotterdam, former account holder in De Verkeersonderneming

- What is De Verkeersonderneming (VO): origins, establishing process, leading stakeholders, expectations, specific assignments, current outcomes, future perspective, etc.?
Related interview objectives and topics to be covered:
 - > Origins and institutional context from the municipality's perspective
 - > Organisational structure the VO and relation with parent organisations
 - > Specific activities and evolution of De Verkeersonderneming and the Beter Benutten programmes
 - > Opportunity for innovation: the marketplace for mobility?
 - > Main challenges and future perspective

Robert Boshouwers

Consultant urban smart mobility, former project manager mobility services at De Verkeersonderneming, project manager Marketplace for Mobility Antwerp

- What is De Verkeersonderneming (VO): origins, establishing process, leading stakeholders, expectations, specific assignments, current outcomes, future perspective, etc.?
Related interview objectives and topics to be covered:
 - > Origins and institutional context
 - > Organisational structure, activities and expansion of the VO in response to the BB-programme
 - > Philosophy behind the Marketplace for Mobility in Rotterdam, in relation to BB-programme
 - > BB programme implementation and its regional differences
 - > Evolution of the VO and BB-programmes, opportunities and threats
- Elaborate on the Marketplace for Mobility in Rotterdam and how this is transferred to Antwerp
Related interview objectives and topics to be covered
 - > Image of the marketplace for mobility and the concept of peak avoidances by parent organisations
 - > Comparison of the institutional context, the financial support, etc. between Antwerp and Rotterdam
 - > Current, successful mobility services
 - > Means of steering and conditions

Helene Moors

Project director Blankenburg Link at Rijkswaterstaat, director ad interim de Verkeersonderneming

- How does the process of the LIP Blankenburgverbinding looks like: origins, alternatives, participation, process and progress, etc.
Related interview objectives and topics to be covered:
 - > Institutional context of infrastructure planning, procedures and instruments in The Netherlands
 - > Origins and framing of the LIP project
 - > Participation trajectory, communication and transparency
 - > Estimated realisation
 - > Comparison of some of the aspect with the LIP Oosterweel Link

Marijke De Roeck

Director communication and participation and programme manager 'Slim naar Antwerpen' at city of Antwerp, programme manager 'Slim naar Antwerpen', city of Antwerp, department for urban development (Stadsontwikkeling)

- What does the Slim Naar Antwerpen (SNA) project and the marketplace for mobility in Antwerp include: origins, best-practices, stakeholders, organisation structure, role of the city in this.
Related interview objectives and topics to be covered:
 - > Institutional and political context in which the marketplace for mobility arose
 - > Relation to other actors and intergovernmental platforms
 - > Slim Naar Antwerpen and its relation to the marketplace for mobility
 - > The role of the city of Antwerp
 - > Link with future transport region Antwerp
 - > Current, successful mobility services
 - > Challenges and opportunities

10.3

Case LIP Oosterweel Link

10.3.1 Interviews

| Date | Name | Organization & Function | Location & Time |
|------------------|-------------------------|---|--|
| 9/06/2015 | S. Augusteyns | Architect – Urban designer at Stramien, urban researcher Ringland | Stramien, Broederminstraat 52, 2018 Antwerp (11h30-12h30) |
| 15/06/2015 | L. Ploegaert | Member of the citizen movement stRaten -generaal | Ballaarstraat 6, 2018 Antwerp (13h30-15h30) |
| 12/01/2016 | J. Verelst | Former journalist for De Morgen, followed the Oosterweel Link project and authored a book about the project | Café Maurice, Cogels -Osylei 88, 2600 Antwerpen (9h30-10h30) |
| 10/02/2017 | F. De Rynck | Professor at the Faculty of Economics and Business Administration, Department of Public Governance, Management and Finance, Ghent University | Henleykaai 84, Campus Mercator G, 9000 Gent (13h-14h) |
| 16/02/2017 | D. Stevens | Advisor complex infrastructure projects, Department of Environment, Nature and Energy, Flemish Government | Graaf de Ferrarisgebouw, Ministerie van de Vlaamse Gemeenschap, Koning Albert II -laan 20, 1000 Brussel (9h30-11h30) |
| 24/03/2017 | T. Wassenberg | Cabinet member of the former Minister of Mobility, K. Van Brempt, and later on municipal councillor in Antwerp | Café Royal, Central Station Antwerp (10h-12h) |
| 4/04/2017 | I. Verhaert | Former deputy for Mobility, Province of Antwerp, coordinator of MOZO -platform | Parkhuis, Koningin Elisabethlei 18, 2018 Antwerp (14h-15h) |
| 1/06/2017 | M. De Roeck | Director communication and participation and program manager ‘Slim naar Antwerpen’ at City of Antwerp, programme manager ‘Slim naar Antwerpen’, City of Antwerp, department for urban development (Stadsontwikkeling) | Francis Wellesplein 1, 2018 Antwerpen (13h-14h) |
| 7/03/2018 | F. Boelaert | Secretary General Department for Mobility and Public Works of the Flemish Government, professor at the department of civil engineering, centre for mobility and spatial planning (Ghent University) | Afdeling Mobiliteit en Ruimtelijke Planning Sint -Pietersnieuwstraat 41 B2, 9000 Gent (9h-10h) |
| regular feedback | L. Boelens, D. Lauwers, | Professors at the department of civil engineering, centre for mobility and spatial planning (Ghent University), both involved in many workshops, public and private discussions on the Oosterweel Link project, supervising this dissertation | At different locations, by different means of communication |
| regular feedback | H. Huyse | Head of sustainable development research group (HIVA), University of Leuven, active member of the Ringland Academy, co-supervising the CurieuzenNeuzen citizen science project in Antwerp, co-authoring a publication | At different locations, by different means of communication |

Table 11 Overview of the interviews for the case of the LIP Oosterweel Link

Sven Augusteyns

Architect – Urban designer at Stramien, urban researcher for and member of the citizen movement Ringland

- How did Ringland evolve from a concept to the brand it almost is today: origins, organisation, innovation, means of building support base, strategy, etc?
Related interview objectives and topics to be covered:
 - > Origins, elaboration and communication of ‘capping’ the ring road
 - > Relation to other citizen movements
 - > Building and sustaining a broad support base, Adopting strategies to spread the idea
 - > Aspiring and anticipating policy adoption
 - > Building expertise around the theme
 - > Increasing professionalisation, organisation structure of Ringland
 - > Future perspective

Linda Ploegaert

Member of the citizen movement stRaten-generaal

- Can you elaborate on the background of the citizen movement stRaten-generaal with respect to origins, front runners, focal themes and levels of commitment, organisation, projects, relation to the Oosterweel Link project, etc?
Related interview objectives and topics to be covered:
 - > How did stRaten-generaal arise; which urban (mobility or infrastructure) issues did it address?
 - > Involvement of the citizen movement in the Oosterweel Link project.
 - > Building knowledge and support base around diverse themes
 - > Engaged in the field of urban and infrastructure projects in the city of Antwerp and elsewhere
 - > Relation to other citizen movements or civil initiatives
 - > Means to mobilise, organisation structure

Jeroen Verelst

Former journalist for De Morgen, followed the Oosterweel Link project and authored a book about the project

- Why did you write a book about the Oosterweel Link process.
Related interview objectives and topics to be covered:
 - > Personal affinity with the Oosterweel Link project and planning process as journalist
 - > Press coverage of the project process and evolution of the project
 - > Specific sources for the book, interviews, press coverage, methodology
 - > What should we learn from the project process?

Filip De Rynck

Professor at the Faculty of Economics and Business Administration, Department of Public Governance, Management and Finance, Ghent University

- Where does the Flemish policy (governance) stand today in terms of participation and how to deal with complexity in complex infrastructure projects?
Related interview objectives and topics to be covered:
 - > Has 'participation' and governance evolved in Flanders/Belgium? (local level and regional level)
 - > Evolutions with respect to earlier contribution in the Parliamentary commission (and report) on complex/investment projects (2009) and involvement of stakeholders
 - > Decree on complex projects, procedures and evolutions in practice
 - > Impact of intergovernmental cooperations such as transport regions
 - > What further direction should governance take? (co-creation, area-specific, etc.)
 - > Good practices?
- To what extent were you involved in Oosterweel?
 - > Related interview objectives and topics to be covered:
 - > Personal reflections on the case, with regard to participation, decision-making strategies, etc.
 - > Citizen movements and their growing position in the debate
 - > Leading actors in the project and their strategies
 - > Role and impact of the intendant: unique opportunity?
 - > Influence of political factors

David Stevens

Advisor complex infrastructure projects, Department of Environment, Nature and Energy, Flemish government

- Complex projects past versus present way of steering
Related interview objectives and topics to be covered:
 - > Evolution of regulations concerning complex projects
 - > Current state of affairs: numbers of projects following the new procedure
 - > Reasons or reflections on why so few projects started in the new procedure
 - > Link with future transport region Antwerp
 - > Team complex projects, organisational structure, instruments (route planner)
 - > Evolution of participation
- To what extent are/were you involved in the Oosterweel Link project
Related interview objectives and topics to be covered:
 - > Personal reflections on the case, with regard to participation, decision-making strategies, etc.
 - > Role and impact of the intendant: unique opportunity?
 - > Challenges with regard to the Oosterweel Link project and capping the ring road
 - > What could his role mean for recent complex project?

Toon Wassenberg

Cabinet member of the former Minister of Mobility, K. Van Brempt, and later on municipal councillor in Antwerp

- What was your position in the Oosterweel Link project from 2004-2009.
- Can you elaborate on the specific political context and the leading actors in the story?
Related interview objectives and topics to be covered:
 - > decisive moments in the LIP planning process
 - > opportunities and threats
 - > leading actors and their role
 - > expectations for the future course of the Oosterweel Link project

Inga Verhaert

Former deputy for Mobility, province of Antwerp

- What was the role of the province of Antwerp, and the governor, in the Oosterweel Link project process?

Marijke De Roeck

Director communication and participation and programme manager 'Slim naar Antwerpen' at city of Antwerp, programme manager 'Slim naar Antwerpen', city of Antwerp, department for urban development (Stadsontwikkeling)

- What was the role of the city of Antwerp in the LIP Oosterweel Link process? What has this to do with *Slim Naar Antwerpen* project and the marketplace for mobility.
 - > Institutional and political context
 - > Relation to other actors and intergovernmental platforms
 - > Link with future transport region Antwerp

Filip Boelaert

Secretary General Department for Mobility and Public Works of the Flemish Government, associate professor at the Department of Civil Engineering, Centre for Mobility and Spatial Planning, Ghent University

- Can you elaborate on your perspective on and your relation with the Oosterweel Link project and the capping of the Antwerp ring road?
Related interview objectives and topics to be covered:
 - > When did you become directly or indirectly involved.
 - > What were the decisive moments in the Oosterweel Link planning process that have eventually led to the Future Covenant and cooperation between all involved actors according to you?
 - > Which bottlenecks still remain, will challenge the project in the (near) future? (financial aspects, ...?)

Huib Huyse

Head of sustainable development research group (HIVA), University of Leuven, active member of the Ringland Academy, co-supervising the CurieuzeNeuzen citizen science project in Antwerp, co-authoring a publication

- Regular feedback on the activities, strategies, knowledge accumulation by the Ringland Academy.
- Inside information on development and strategic partnerships to conduct a large-scale citizen science project (CurieuzeNeuzen).
- Co-authored a publication with me examining the effects of such citizen science project with regard to scientifically rigorous data, policy adoption, and deep citizen engagement and social learning.

10.3.2 Roundtable discussion

Roundtable Complex Infrastructure Projects – the Oosterweel Link Project

Greet Bernaers – *Director infrastructure and environment, Port of Antwerp*

David Stevens – *Advisor complex infrastructure projects, Department of Environment, Nature and Energy, Flemish government*

Ilse Moeremans – *Proces consultant complex projects, spatial development department, Flemish government*

Bert De Bondt – *Policy advisor, Department of Mobility and Infrastructure, Flemish government*

Jan Van Rensbergen – *CEO Beheermaatschappij Antwerpen Mobiel (BAM)*

Peter Vermeulen – *Initiator Ringland*

Manu Claeys – *Initiator stRaten-generaal*

- Abstract The current approach to govern or manage large infrastructure projects (LIPs) is put under pressure by an increasing number of actors and ever changing conditions. How can planning deal with the inherent complexity of such LIP processes? We propose a more integrated approach in which co-evolution is paramount. We are applying this new approach to the already long term and complex Oosterweel project. By means of an expert workshop with a number of relevant stakeholders, we try to shape this approach. Do the stakeholders agree? How do they interpret the course of the Oosterweel project from a co-evolutionary perspective? What does it add to the LIP project?

10.3.3 Ethnographic research Ringland – overview of internal meetings and attended public events

Internal Feedback meetings with Ringland

| <i>Date</i> | <i>Attendees</i> | <i>Location and time</i> |
|-------------|---|---|
| 24/09/2015 | Sven Augusteyns and Pol Van Steenvoort (Ringland), Luuk Boelens, Dirk Lauwers, and Suzanne Van Brussel (Ghent University) | Stramien, Broederminstraat 52, 2018 Antwerp (14h30-16h) |
| 3/12/2015 | idem 2018 Antwerp (14h30-15h30) | Stramien, Broederminstraat 52, |
| 22/02/2016 | Veerle Janssens and Pol Van Steenvoort (Ringland), Luuk Boelens, Dirk Lauwers, and Suzanne Van Brussel (Ghent University) | Stramien, Broederminstraat 52, 2018 Antwerp (15h30-16h30) |
| 25/08/2016 | idem | Stramien, Broederminstraat 52, 2018 Antwerp (14h30-15h30) |

Attended Executive Committee meetings

| <i>Date</i> | <i>Attendees</i> | <i>Location and time</i> |
|-------------|--|---|
| 6/10/2015 | Peter Vermeulen, Pol Van Steenvoort, Sven Augusteyns, Joris Baeten, Mat Steyvers (Ringland) | Stramien, Broederminstraat 52, 2018 Antwerp (17h30-20h) |
| 3/11/2015 | Peter Vermeulen, Pol Van Steenvoort, Sven Augusteyns, Joris Baeten (Ringland) | Stramien, Broederminstraat 52, 2018 Antwerp (17h30-20h) |
| 1/12/2015 | Peter Vermeulen, Pol Van Steenvoort, Joris Baeten, Veerle Janssens, Sven Augusteyns, Mat Steyvers, Wietse Vermeulen, Frans Teuchies (Ringland) | Stramien, Broederminstraat 52, 2018 Antwerp (14h30-15h30) |

Attended Steering Committee Meetings Ringland

| <i>Date</i> | <i>Attendees</i> | <i>Location and time</i> |
|-------------|-----------------------------|--|
| 20/10/2015 | Ringland Steering Committee | Haringrokerij, Kronenbrugstraat 34, 2000 Antwerp (19h30-23h30) |
| 19/11/2015 | Ringland Steering Committee | Haringrokerij, Kronenbrugstraat 34, 2000 Antwerp (19h30-23h30) |
| 9/01/2016 | Ringland Steering Committee | Haringrokerij, Kronenbrugstraat 34, 2000 Antwerp (19h30-23h30) |
| 2/02/2016 | Ringland Steering Committee | Haringrokerij, Kronenbrugstraat 34, 2000 Antwerp (19h30-23h30) |

Attended workshops and events Ringland

| <i>Date</i> | <i>Attendees</i> | <i>Location and time</i> |
|-------------|--|--|
| 12/05/2015 | Ringland Expert Colloquium – “Ringland Het Plan” | deSingel, Desguinlei 25, 2018 Antwerpen (13h30-17h) |
| 26/04/2016 | Ringland in zicht? | De Roma, Turnhoutsebaan 286, 2140 Borgerhout (20h-23h) |
| 23/10/2016 | CurieuzeNeuzen in de Roma | De Roma, Turnhoutsebaan 286, 2140 Borgerhout (11h-14h30) |
| 1/07/2017 | Ringland citizen science doordenkdag | Haringrokerij, Kronenbrugstraat 34, 2000 Antwerp (10h-15h) |

11

Appendix 2. Data acquisition, data analysis and visualisation

11.1

Case regional mobility cooperation

11.1.1 Mozo

The coded interviews in the MOZO case resulted in the identification of 109 actors. In order to optimise the visualisation of the actor network in the case a selection of this total number was applied. The following selection criteria were used. As the number of sources is rather limited, we decided that actors had to be mentioned at least 2 times (i.e. coded in 2 different paragraphs), or had to be mentioned by two different interviewees (i.e. show up in at least two source documents). As such the actor prove to be relevant for more than one involved person (interviewee). After selection, 54 (f)actors were included in the actor network visualisation. An overview of the (f)actors, their connections and the other attributes is provided in Table 12.

11.1.2 Regional mobility cooperation Mechelen

The coded interviews in the case of the C-AR and the transport region Mechelen resulted in the identification of 248 actors and factors. In order to optimise the visualisation of the actor network in the case a selection of this total number was applied. The following selection criteria were used. The actors had to be mentioned at least 5 times (i.e. coded in 2 different paragraphs), or had to be mentioned by at least two different interviewees (i.e. show up in at least two source documents). After selection, 102 actors were included in the actor network visualisation. An overview of the (f)actors, their connections and the other attributes is provided in Table 7.

11.2

Case entrepreneurial mobility cooperation the VO

The coded interviews in the case of the C-AR and the transport region Mechelen resulted in the identification of 144 actors and factors. In order to optimise the visualisation of the actor network in the case a selection of this total number was applied. By screening the data we noticed that many named actors were only mentioned once or twice over all the interviews. So, excluding the actors that were mentioned less than three times, already restricted the number of actors to about half of the initial amount. After selection, 72 actors were retained for the actor network visualisation. An overview of the (f)actors, their connections and the other attributes is provided in Table 14.

Table 12 Overview of the selected actors, their connections, and attributes in the SLUIZO/MOZO case.

| Nr. | Actor | Connecties | TTTE_UM | N | BCPK_NUM | NRL_NUM | N_Cod Ref | N_CodS ources | <2007 | 2007 | 2008 | >2009 | In_AN |
|-----|-------------------------------|---|---------|---|----------|---------|-----------|---------------|-------|------|------|-------|-------|
| 2 | Masterplan A | Port of Antwerp, Provincie A, Stad A, DMOW, NMBS, AIVV, De Lijn, BAM, Antea Group, Grontmij, Technum, Arcadis, brabo 2, Koen Kennis, H. Crevits, B. Weys, Oosterweelverbinding, minder hinder, Liefkenshoek, Sluipverkeer, Mortsel, K. Van Brempt, R11, Trémverlenging, Kontich, Missing links, H. Crevite BAM, Masterplan, Liefkenshoek, J. Polan, G. Van Alboom, Lenge Wepper, H. Crevits, B. Weys, Stad A, Meccano, Oosterweel-Noord, Intendant, Ringland, stRoten-generaal, Ademloos, Vlareg, kwaliteitskamer, Noriant, TVSAM, planMER, projectMER, GRUP, Horvathstudie, ArupSum, staten generaal, C. Paulus, Masterplan A, Sluipverkeer, RSV, | 6 | 3 | 2 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 3 | Oosterweelverbinding | stRoten-generaal, Ademloos, Vlareg, kwaliteitskamer, Noriant, TVSAM, planMER, projectMER, GRUP, Horvathstudie, ArupSum, staten generaal, C. Paulus, Masterplan A, Sluipverkeer, RSV, | 3 | 3 | 2 | 3 | 3 | 1 | 1 | 1 | 1 | 1 | 1 |
| 4 | R11 | Wegencategorisering, Gewestwegen, AWW, Mortsel, Eindrapport Sluzo | 3 | 3 | 2 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 5 | Mobiliteitsgedrag verandering | Vervoerregio Antwerpen, Vervoerregio Mechelen, Gemeenten ZO, SLUIZO-studie, Actieplan Provincie A, Fietscatriede, Masterplan A, Gemeenten ZO, Gemeenten NK, MOZO-platform, I. Verhaert (sp.a) | 2 | 0 | 1 | 3 | 1 | 0 | 1 | 1 | 1 | 1 | 1 |
| 8 | BFF | Provincie A, Masterplan A, Gebruikers, I. Verhaert (sp.a), BFF | 3 | 3 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 |
| 9 | Fietsbeleid | Provincie A, Masterplan A, Gebruikers, I. Verhaert (sp.a), BFF | 6 | 3 | 2 | 5 | 2 | 1 | 1 | 1 | 1 | 1 | 1 |
| 10 | Quick Wins | Masterplan A, SLUIZO-studie, Intergemeentelijke samenwerking, | 3 | 3 | 1 | 2 | 1 | 0 | 0 | 1 | 1 | 1 | 1 |
| 11 | Sluipverkeer | SLUIZO-studie, MOZO-platform, Gemeenten ZO, Lokale burgemeesters, Interbestuurlijke samenwerking, Mobiliteitsgedrag verandering MOZO-platform, Arcokus, Gemeenten ZO, Sluipverkeer, K. Van Brempt | 3 | 0 | 3 | 23 | 3 | 1 | 1 | 1 | 1 | 1 | 1 |
| 12 | SLUIZO-studie | (sp.a), Mobiliteitsgedrag verandering, Actieplan, Zandhoven, Lier, Antwerpen, D. Lauwers, T. Wassenberg (sp.a), | 6 | 3 | 1 | 12 | 3 | 0 | 1 | 1 | 1 | 1 | 1 |
| 19 | Burgers-gebruikers | Pendellfonds, Gemeenten ZO, N-VA, Gemeenten ZO, Vleperl, Gouverneur A, H. Crevits (CD&V), K. Peeters (CD&V), K. Snyders (CD&V), Edegem, Gemeenten ZO, Vlareg04-05, Vlareg09-14, Vlareg14- | 10 | 2 | 1 | 3 | 2 | 1 | 1 | 1 | 1 | 1 | 1 |
| 20 | CD&V | CD&V, Vleperl, Gemeenten ZO, P. Muylers (N-VA), A. De Ridder (N-VA), J. Peumans (N-VA), partijpolitiek parallelcircuit, B. De Wever (N-VA), B. Weys (N-VA), Vlareg04-05, Vlareg09-14, Vlareg14- | 4 | 3 | 2 | 2 | 1 | 0 | 1 | 1 | 1 | 1 | 1 |
| 23 | N-VA | Stad A, Vleperl, I. Verhaert (sp.a), K. Van Brempt (sp.a), T. Wassenberg (sp.a), S. Stevaert (sp.a), F. Vandenbroucke (sp.a), P. Janssens (sp.a), Vlareg09-04, Vlareg04-09, | 4 | 3 | 3 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 25 | sp.a | MOZO-platform, Actieplan, Intentieverklaring MOZO, Noorderkempen, Gemeenten ZO, MOZO-platform, SLUIZO-studie, Provincie A, Vleperl, | 2 | 3 | 3 | 3 | 1 | 0 | 1 | 1 | 1 | 1 | 1 |
| 27 | NMBS | Interbestuurlijke samenwerking, Stad A, MOZO-platform, Brasschaot, Mortsel, Borsbeek, Boechout, partiparallel circuit, Gemeenten ZO, | 1 | 3 | 1 | 10 | 2 | 0 | 1 | 1 | 1 | 1 | 1 |
| 28 | Lokale burgemeesters | IGEMO, SWV-BR, Interbestuurlijke samenwerking, MOZO, | 6 | 3 | 2 | 2 | 2 | 0 | 0 | 0 | 1 | 1 | 1 |
| 30 | Vervoerregio Antwerpen | SWV BR, Vervoerregio Mechelen, Intergemeentelijke samenwerking, Arendonk, Ravels, Oud-Turnhout, Interbestuurlijke samenwerking, Noorderkempen, ANB, Natuurpunt, vzw Kempen Landschap, Provincie A, I. Verhaert (sp.a), INTOE, | 13 | 3 | 1 | 2 | 1 | 0 | 0 | 0 | 1 | 1 | 1 |
| 31 | Vervoerregio Mechelen | Intergemeentelijke samenwerking, Antwerpen, Baringen, Bilsen, Diepenbeek, Geel, Gans, Grobbendonk, Ham, Hasselt, Herentals, Housden-Zelden, Leekdal, Lanaken, Lummen, Meerhout, Olen, Ranst, Schilde, Schoten, Tessenderlo, Westerlo, Wommelgem, Wijnegem, Zandhoven en Zutendaal, Gemeenten ZO, RSV, K. Peeters (CD&V), D. Van Mechelen (Open Vid), K. Van Brempt (sp.a), Vlareg04-05, | 1 | 3 | 2 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 32 | IGEMO | Intergemeentelijke samenwerking, Arendonk, Ravels, Oud-Turnhout, Interbestuurlijke samenwerking, Noorderkempen, ANB, Natuurpunt, vzw Kempen Landschap, Provincie A, I. Verhaert (sp.a), INTOE, | 1 | 3 | 2 | 5 | 1 | 0 | 0 | 0 | 1 | 1 | 1 |
| 33 | ARO | Intergemeentelijke samenwerking, Antwerpen, Baringen, Bilsen, Diepenbeek, Geel, Gans, Grobbendonk, Ham, Hasselt, Herentals, Housden-Zelden, Leekdal, Lanaken, Lummen, Meerhout, Olen, Ranst, Schilde, Schoten, Tessenderlo, Westerlo, Wommelgem, Wijnegem, Zandhoven en Zutendaal, Gemeenten ZO, RSV, K. Peeters (CD&V), D. Van Mechelen (Open Vid), K. Van Brempt (sp.a), Vlareg04-05, | 1 | 3 | 2 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 34 | ENA | Intergemeentelijke samenwerking, Interbestuurlijke samenwerking, eindrapport MOZO, SLUIZO-studie, Gemeenten ZO, Intentieverklaring, I. Verhaert (sp.a), MOV, De Lijn, NMBS, Provincie A, Stramien, Omgeving, F. Leys, | 6 | 3 | 2 | 27 | 3 | 0 | 0 | 1 | 1 | 1 | 1 |
| 35 | MOZO-platform | SLUIZO-studie, MOZO-platform, Mortsel (-1), Sluipverkeer, Lokale burgemeesters, Aartselaar, Boeschout, Borsbeek, Edegem, Hove, Kontich, Mortsel, Ranst, Wijnegem, Wommelgem, Zandhoven, Lier, Stad A, Provincie A, Vervoerregio A, Poort Oost | 1 | 3 | 1 | 39 | 3 | 0 | 1 | 1 | 1 | 1 | 1 |
| 36 | Gemeenten ZO | Gemeenten ZO | 10 | 3 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 39 | Borsbeek | Gemeenten ZO, SLUIZO-studie (-1), | 10 | 3 | 1 | 3 | 2 | 1 | 1 | 1 | 1 | 1 | 1 |
| 40 | Edegem | | 10 | 3 | 1 | 3 | 2 | 1 | 1 | 1 | 1 | 1 | 1 |

| | | | | | | | | | | | | | |
|-----|-------------------------|--|----|---|---|----|---|---|---|---|---|---|---|
| 42 | Kontich | Gemeenten ZO, SLUIZO-studie (-1), | 10 | 3 | 1 | 3 | 2 | 1 | 1 | 1 | 1 | 1 | 1 |
| 44 | Stad A | Gemeenten ZO, Vervoerregio Antwerpen, Provincie A, Mesterplan A, Oosterweelverbinding, Poort Oost | 10 | 3 | 1 | 5 | 2 | 1 | 1 | 1 | 1 | 1 | 1 |
| 46 | Mortsel | Gemeenten ZO, R11, | 10 | 3 | 1 | 11 | 2 | 1 | 1 | 1 | 1 | 1 | 1 |
| 51 | Intentieverklaring MOZO | Gemeenten ZO, MOZO-platform, De Lijn, Provincie A, AWV, DMOW | 6 | 3 | 2 | 2 | 1 | 0 | 0 | 1 | 1 | 1 | 1 |
| 52 | Noorderkempen | Intergemeentelijke samenwerking, Interbestuurlijke samenwerking, Studie Noorderkempen, Provincie A, DMOW, Gemeenten NK, Arendonk, Beerle-Hertog, Beerse, Brecht, Hoogstraten, Lille, Malle, Merksplas, Oud-Turnhout, Revels, Rijkvonsel, Turnhout, Vosselaar, Zoersel, Noorderkempen, Provincie A, | 13 | 3 | 2 | 12 | 2 | 0 | 0 | 0 | 1 | 1 | 1 |
| 53 | Gemeenten NK | Revels, Rijkvonsel, Turnhout, Vosselaar, Zoersel, Noorderkempen, Provincie A, | 10 | 3 | 1 | 69 | 1 | 0 | 0 | 0 | 1 | 1 | 1 |
| 54 | Arendonk | ARO, Noorderkempen, Gemeenten NK, | 10 | 3 | 1 | 6 | 1 | 0 | 0 | 0 | 1 | 1 | 1 |
| 56 | Beerse | Gemeenten NK, Stadsregio Turnhout, | 10 | 3 | 1 | 5 | 1 | 0 | 0 | 0 | 1 | 1 | 1 |
| 62 | Oud-Turnhout | Gemeenten NK, ARO, Stadsregio Turnhout | 10 | 3 | 1 | 6 | 1 | 0 | 0 | 0 | 1 | 1 | 1 |
| 63 | Revels | Gemeenten NK, | 10 | 3 | 1 | 6 | 1 | 0 | 0 | 0 | 1 | 1 | 1 |
| 65 | Turnhout | Gemeenten NK, Stadsregio Turnhout, Vervoerregio aanvraag Turnhout | 10 | 3 | 1 | 5 | 1 | 0 | 0 | 0 | 1 | 1 | 1 |
| 66 | Vosselaar | Gemeenten NK, Stadsregio Turnhout, | 10 | 3 | 1 | 5 | 1 | 0 | 0 | 0 | 1 | 1 | 1 |
| 69 | Studie Noorderkempen | Noorderkempen, Vectris, Provincie A, Stramien, Tri-Vizor, | 13 | 4 | 1 | 2 | 1 | 0 | 0 | 0 | 1 | 1 | 1 |
| 71 | Provincie A | I. Verhaert (sp.a), Gouverneur A, Noorderkempen, Gemeenten ZO, Gemeenten NK, DMOW, POM Antwerpen, Dep. REM, Interbestuurlijke samenwerking, Fietsostrades, BFF, Noorderlijn, Studie Noorderkempen, SLUIZO-studie, ARO, ENA | 2 | 3 | 3 | 16 | 2 | 1 | 1 | 1 | 1 | 1 | 1 |
| 72 | Gouverneur A | I. Verhaert (sp.a), Dep. REM, Poort Oost, | 2 | 3 | 3 | 2 | 2 | 1 | 0 | 1 | 1 | 1 | 1 |
| 73 | Poort Oost | Gouverneur A, Oosterweelverbinding, R11, H. Crevits, B. Weyts, Vlareg09-14, Vlareg14+, Provincie A, sp.a, K. Van Brempt (sp.a), | 3 | 3 | 2 | 4 | 3 | 0 | 0 | 0 | 1 | 1 | 1 |
| 74 | I. Verhaert (sp.a) | Noorderkempen, ARO, sp.a, ARO, Noorderkempen, MOZO-platform | 2 | 3 | 2 | 9 | 3 | 0 | 0 | 1 | 1 | 1 | 1 |
| 75 | Dep. REM | Provincie A, Noorderkempen, W. Lux, | 13 | 3 | 3 | 2 | 1 | 0 | 0 | 0 | 1 | 1 | 1 |
| 76 | Vlareg04-09 | CD&V, K. Peeters (CD&V), H. Crevits (CD&V), K. Van Brempt (sp.a), sp.a, Open VLD, N-VA | 13 | 3 | 2 | 30 | 3 | 1 | 1 | 1 | 0 | 1 | 1 |
| 83 | Vlareg99-04 | S. Stevaert (sp.a), P. Dewael (Open Vld), sp.a, Open Vld, Groen! | 13 | 3 | 2 | 4 | 1 | 1 | 1 | 1 | 0 | 0 | 1 |
| 91 | AWV | DMOW, MOZO-platform, SLUIZO-studie, Noorderkempen, H. Crevits (CD&V), K. Peeters (CD&V), S. Stevaert (sp.a), Vlaamse administraties, Vervoerregio Mechelen, Vervoerregio Antwerpen, Oosterweelverbinding, | 3 | 3 | 3 | 10 | 3 | 0 | 1 | 1 | 1 | 1 | 1 |
| 92 | De Lijn | DMOW, K. Van Brempt (sp.a), S. Stevaert (sp.a), H. Crevits (CD&V), MOZO-platform, SLUIZO-studie, Noorderkempen, Vervoerregio Mechelen, Vervoerregio Antwerpen, | 2 | 3 | 3 | 8 | 3 | 0 | 1 | 1 | 1 | 1 | 1 |
| 94 | DMOW | Vlaamse administraties, F. Leys, T. Janssens, AWV, MOZO-platform, SLUIZO-studie, | 6 | 3 | 3 | 11 | 3 | 0 | 1 | 1 | 1 | 1 | 1 |
| 95 | F. Leys | Vervoerregio Mechelen, Vervoerregio Antwerpen, Vervoerregio aanvraag Turnhout, DMOW, MOZO-platform, T. Janssens, Gemeenten ZO | 2 | 3 | 3 | 5 | 2 | 0 | 1 | 1 | 1 | 1 | 1 |
| 98 | Ruimte Vlaanderen | Vlaamse administraties, RSV, P. Muyters (N-VA), MOZO-platform, Noorderkempen, | 1 | 3 | 3 | 6 | 3 | 0 | 0 | 0 | 1 | 1 | 1 |
| 99 | VlaPar1 | A. De Ridder (N-VA), J. Peumans (N-VA), Gemeenten ZO, MOZO-platform (-1), | 4 | 3 | 3 | 3 | 1 | 0 | 1 | 1 | 1 | 1 | 1 |
| 102 | Arcadis | M. Keppens, Stad A, ArcCUS, Oosterweelverbinding, | 4 | 4 | 2 | 4 | 2 | 0 | 1 | 1 | 0 | 1 | 1 |
| 104 | ArcCUS | SLUIZO-studie, Arcadis, | 4 | 4 | 1 | 2 | 1 | 0 | 1 | 1 | 0 | 1 | 1 |
| 107 | Omgeving | Studie Noorderkempen, Stramien | 4 | 4 | 2 | 3 | 2 | 0 | 0 | 0 | 1 | 1 | 1 |
| 108 | Stramien | Studie Noorderkempen, Omgeving, | 4 | 4 | 1 | 3 | 2 | 0 | 0 | 0 | 1 | 1 | 1 |

Table 13 Overview of the selected actors, their connections, and attributes in the development of regional mobility cooperation in Mechelen.

| N_ID | Actors | Connections | TITE_N UM | RCPK_N UM | NRL_NU M | NCodRef | NCodSour ces | voor2015 | 2015 | 2016 | 2017 | na2017 |
|------|---|---|--------------|--------------|-------------|---------|-----------------|----------|------|------|------|--------|
| 1 | Europese subsidies | BFF, Vervoerregio M, W. Abele | 3 | 3 | 3 | 5 | 2 | 1 | 1 | 1 | 1 | 1 |
| 2 | Pendelfonds | Voka A, werkgemeenschap, werkgemeenschap, DMOW, Vlareg05-08, MOZO, Vervoer op maat, | 2 | 3 | 3 | 2 | 2 | 1 | 1 | 1 | 1 | 1 |
| 3 | BFF | Vervoerregio M, Pilots, Prov A, Fietsstrade, Masterplan A, Gemeenten 20, Gemeenten NK, MOZO -platform, I Verhaert (opa) | 3 | 3 | 3 | 4 | 2 | 1 | 1 | 1 | 1 | 1 |
| 4 | BlueBike | Vervoerregio M, NMBS, Aanvullend net, BFF, Vervoerregio M, Mobiliteitsplan M, Putte, Borneiden, Mechelen, Haecht, Boortmeembek, Kaerbergen, Sint-Katelijne-Waver, | 2 | 3 | 1 | 2 | 2 | 0 | 0 | 0 | 1 | 1 |
| 5 | Fietsstraten | Vervoerregio's, Bedrijfsvervoer, Havenvervoer, Decreet BB, | 2 | 3 | 1 | 16 | 7 | 1 | 1 | 1 | 1 | 1 |
| 6 | Aanvullend Net | De Lijn, Aanvullend net, Vervoer op maat, | 2 | 3 | 1 | 4 | 3 | 1 | 1 | 1 | 1 | 1 |
| 8 | Belbuscentrale | Vervoerregio M | 2 | 3 | 1 | 3 | 2 | 0 | 0 | 1 | 1 | 1 |
| 9 | Buurtbus | De Lijn, Decreet BB, Vervoerregio's, | 2 | 3 | 2 | 12 | 7 | 1 | 1 | 1 | 1 | 1 |
| 13 | Kennet | Regionet Mechelen, Vervoerregio's, Vervoerregio M, BUUR, Prov VI-B, Stad Leuven, De Lijn, AWV, NMBS, Interleuven, Ruimte Vlaanderen, DDMG | 2 | 3 | 3 | 2 | 2 | 0 | 1 | 1 | 1 | 1 |
| 15 | Regionet Leuven | Decreet BB, NMBS, | 2 | 3 | 3 | 3 | 2 | 1 | 1 | 1 | 1 | 1 |
| 16 | Treinnet | Vervoer op maat, Vervoerregio's | 2 | 1 | 1 | 19 | 6 | 1 | 1 | 1 | 1 | 1 |
| 17 | Vervoer op maat | Decreet BB, Vervoerregio's | 2 | 0 | 1 | 24 | 6 | 0 | 0 | 1 | 1 | 1 |
| 18 | Mobiliteitsgedrag verandering | Decreet BB, Vervoerregio's | 2 | 0 | 1 | 24 | 6 | 0 | 0 | 1 | 1 | 1 |
| 19 | Geleningprojecten | Vervoerregio M, G. Vagans, | 2 | 3 | 1 | 6 | 2 | 0 | 0 | 1 | 1 | 1 |
| 20 | Beloningprojecten | Vervoerregio M, Mobiliteitsgedrag verandering, VGGatendem | 2 | 1 | 1 | 8 | 5 | 0 | 0 | 1 | 1 | 1 |
| 22 | Werkgeversaanpak | BAM, Masterplan, Liefkenshoek, J. Polen, G. Van Alboom, Lange Wapper, H. Drevels, B. Ways, Stas A, Maccaro, Oosterweel-Noord, Intendant, Ringland, stRalen -generaal, Ademloos, Vlareg, kwaliteitskamen, Nohant, TVSAM, planMER, projectMER, GRUP, Horvathstudie, AnusSum, stalen generaal, C. Paulus, Poort Oost | 3 | 3 | 2 | 14 | 3 | 1 | 1 | 1 | 1 | 1 |
| 28 | Oosterweelverbinding | Overkapping, Werkgemeenschap, Overkappingswedstrijd, Superworkshops, Antwerps werkplatform, Toekomstverbond, Vervoerregio A, Intendant D'Hooghe, Routeplan 2020, Stad A, Ringland, Ademloos, stRalen -generaal, Burgerbeveiligingen, Vlareg14 - B. Ways, Havennacé, Oosterweelverbinding, Oosterweel light, | 3 | 3 | 2 | 14 | 3 | 1 | 1 | 1 | 1 | 1 |
| 29 | Overkapping, Werkgemeenschap, Overkappingswedstrijd, Superworkshops, Antwerps werkplatform, Toekomstverbond, Vervoerregio A, Intendant D'Hooghe, Routeplan 2020, Stad A, Ringland, Ademloos, stRalen -generaal, Burgerbeveiligingen, Vlareg14 - B. Ways, Havennacé, Oosterweelverbinding, Oosterweel light, | Overkapping, Overkappingswedstrijd, Superworkshops, Toekomstverbond, Vlareg14 - | 10 | 9 | 2 | 6 | 1 | 0 | 0 | 1 | 1 | 0 |
| 30 | Toekomstverbond | Decreet Personenvervoer, MDW, Vervoerregio's, De Lijn, Vlareg14 - pilots, Mobiliteitsplan M, Mobiliteitsplan W, Mobiliteitsplan A, Mobiliteitsplan V, Mobiliteitsplan_As, Treinnet, Kennet, Aanvullend net, Vervoer op maat, | 13 | 3 | 2 | 12 | 3 | 0 | 0 | 0 | 1 | 1 |
| 32 | Intendant D'Hooghe | Decreet Personenvervoer, MDW, Vlareg14 - | 10 | 9 | 2 | 6 | 1 | 0 | 0 | 1 | 1 | 0 |
| 38 | Decreet BB | Ruimte Vlaanderen, Vervoersgebieden, DDMG | 2 | 3 | 2 | 4 | 4 | 0 | 0 | 1 | 1 | 1 |
| 39 | Conceptnote BB | De Lijn, Bestsmobiliteit, Vervoersgebieden, Vervoerregio's, Pilots, De Lijn (-1), Aanvullend net, Vervoer op maat, Decreet BB | 2 | 3 | 2 | 4 | 2 | 1 | 1 | 1 | 1 | 1 |
| 40 | Decreet Personenvervoer | Wagencategorisering, Vrochtverkeeroutes, Ruimte Vlaanderen, Logistieke Ksart, DDMG | 2 | 3 | 2 | 4 | 2 | 1 | 1 | 1 | 1 | 1 |
| 42 | Decreet Regaliow kader | Bedrijfsvervoer, Werkgemeenschap, Middenveld | 2 | 3 | 1 | 4 | 3 | 0 | 0 | 1 | 1 | 1 |
| 47 | RSV | Vervoer op maat, Fabetra, Unizo, Voka, Werkgemeenschap, Mandatgroep | 1 | 3 | 3 | 3 | 2 | 1 | 1 | 1 | 1 | 1 |
| 48 | Bedrijfsvervoer | Fabetra, Unizo, Voka, Werkgemeenschap, Mandatgroep | 2 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 1 |
| 49 | Middenveld | Logistieke kaart, Middenveld, | 4 | 1 | 1 | 2 | 2 | 0 | 0 | 1 | 1 | 1 |
| 50 | Unizo | Logistieke kaart, Middenveld, | 4 | 1 | 3 | 4 | 4 | 0 | 0 | 1 | 1 | 1 |
| 53 | Voka | Fietsersbond, Mobiliteits, Over de brug, TrainTramBus, Kenkardgroep, Mandatgroep, | 4 | 2 | 1 | 8 | 2 | 0 | 0 | 1 | 1 | 1 |
| 54 | Gelangen groepen | Overkappingswedstrijd, Superworkshops, Read van state, GRUP (-1), | 4 | 2 | 1 | 8 | 2 | 0 | 0 | 1 | 1 | 1 |
| 55 | Burgerorganisaties | Werkgemeenschap, Toekomstverbond, Ringland, Ademloos, stRalen -generaal, Kenkardgroep, Mandatgroep, | 4 | 2 | 1 | 23 | 4 | 1 | 1 | 1 | 1 | 1 |
| 60 | Burgerorganisaties | TML, Studie De Lijn, | 4 | 4 | 1 | 6 | 4 | 0 | 0 | 1 | 1 | 1 |
| 67 | Deloitte | APPM, The New Drive, IMOB, Vervoerregio M, Ambtelijke werkgroep, Vervoerregio_As, Vervoerregioeend M, | 4 | 4 | 1 | 5 | 2 | 0 | 0 | 1 | 1 | 1 |
| 69 | IMOB | APPM, The New Drive, IMOB, Vervoerregio M, Ambtelijke werkgroep, Vervoerregio_As, Vervoerregioeend M, | 4 | 4 | 1 | 15 | 4 | 0 | 0 | 1 | 1 | 1 |
| 73 | The New Drive | Studie De Lijn, Deloitte, | 4 | 4 | 1 | 6 | 4 | 0 | 0 | 1 | 1 | 1 |
| 75 | TML | Deloitte, TML, De Lijn, Decreet BB, kennet, aanvullend net | 2 | 3 | 2 | 8 | 4 | 0 | 0 | 1 | 1 | 0 |
| 76 | Studie De Lijn | Vervoerregio W, Vervoerregioeend W, | 4 | 4 | 1 | 4 | 3 | 0 | 0 | 1 | 1 | 1 |
| 77 | Trejnnet | Vervoerregioeend, De Lijn, Treinnet, BFF, SWV BR, Vervoerregio M, Vervoerregio's, | 2 | 3 | 3 | 17 | 7 | 1 | 1 | 1 | 1 | 1 |
| 78 | NMBS | | | | | | | | | | | |

| | | | | | | | | | | | | |
|-----|--------------------------------|---|----|---|---|----|----|---|---|---|---|---|
| 81 | Vervoerregio's | Decreet Regelluul kader, Decreet Personenvervoer, Decreet BB, Basismobiliteit, Vervoerregio A, Vervoerregio_As, Vervoerregio M, Vervoerregio W, | 6 | 3 | 2 | 18 | 5 | 0 | 0 | 1 | 1 | 1 |
| 82 | Vervoerregio_As | Vervoerregio's, Decreet BB, Decreet Regelluul kader, DMOW, | 2 | 3 | 2 | 10 | 5 | 0 | 0 | 1 | 1 | 1 |
| 101 | Mobiliteitsplan_As | Gemeenten Aalst, Vervoerregio_As, DMOW, AWV, De Lijn, Gemeenten Aalst, | 6 | 3 | 2 | 3 | 3 | 0 | 0 | 0 | 1 | 1 |
| 102 | Vervoerregioeend_As | Vervoerregio_As, Mobiliteitsplan VAs, The New Drive, IMOB, Goudappel Coffeng, APPM, | 6 | 3 | 2 | 7 | 3 | 0 | 0 | 1 | 1 | 1 |
| 103 | Vervoerregio_Aanvraag Turnhout | Vervoerregio's, DMOW, | 6 | 3 | 3 | 2 | 2 | 0 | 0 | 0 | 1 | 1 |
| 104 | Vervoerregio A | Antwerps Werkplatform, Vervoerregioeend A, Taskforce, Routeplan 2030, Werkgemeenschap, Werkbanken, Superworkshops, Intendant, Gemeenten A, Burgerraad, | 6 | 3 | 2 | 24 | 9 | 0 | 0 | 0 | 1 | 1 |
| 106 | BAM | Antwerps Werkplatform, Oosterweelverbinding, Masterplan A, Toekomstverbond, | 3 | 3 | 2 | 20 | 5 | 0 | 0 | 0 | 1 | 1 |
| 108 | Gemeenten A | MOZO, SWV BR, Vervoerregioeend A, Routeplan 2030, Prov A, Werkgemeenschap, | 10 | 3 | 2 | 5 | 3 | 0 | 0 | 0 | 1 | 1 |
| 111 | HbA | MM_A, Stuurgroep impactmanagement, Werkgeversaanpak, Stad A, K. Kennis, BAM, | 6 | 3 | 2 | 6 | 2 | 0 | 0 | 0 | 1 | 1 |
| 112 | Stad A | Toekomstverbond, Superworkshops, Vervoerregio A, Vervoerregioeend A, Werkgemeenschap, Gemeenten A, Werkgeversaanpak, Overkappingswedstrijd, Velos, MM_A, Slim naar A, | 10 | 3 | 2 | 36 | 6 | 0 | 0 | 0 | 1 | 1 |
| 113 | K. Kennis | Stad A, B. Weyts, Toekomstverbond, HbA, | 10 | 3 | 2 | 4 | 2 | 0 | 0 | 0 | 1 | 1 |
| 117 | M. De Roeck | MM_A, Stad A, Slim naar A, | 6 | 3 | 2 | 6 | 1 | 0 | 0 | 0 | 1 | 1 |
| 122 | Slim naar A | Stad A, Oosterweelverbinding, M. De Roeck, BAM, Mobiliteitsgedrag verandering, Minden hinder, MM_A, Werkgeversaanpak, MM_R | 6 | 3 | 2 | 13 | 2 | 0 | 0 | 1 | 1 | 1 |
| 154 | Intendant | Vervoerregio A, Werkgemeenschap | 6 | 4 | 2 | 4 | 2 | 0 | 0 | 0 | 0 | 1 |
| 155 | Routeplan 2030 | Vervoerregio A, Gemeenten A, Masterplan A, | 13 | 3 | 2 | 13 | 4 | 0 | 0 | 0 | 1 | 1 |
| 157 | Vervoerregioeend A | Vervoerregio A, Werkgemeenschap, Routeplan 2030, MDW, | 6 | 3 | 2 | 13 | 4 | 0 | 0 | 0 | 1 | 1 |
| 158 | Werkgemeenschap | Vervoerregio A, Intendant | 13 | 3 | 2 | 12 | 1 | 0 | 0 | 0 | 1 | 1 |
| 160 | Vervoerregio M | Vervoerregio's, Pilots, Vervoerregioeend M, Vervoercollege, Mobiliteitsplan M, | 6 | 3 | 2 | 48 | 12 | 0 | 0 | 1 | 1 | 1 |
| 161 | Ambtelijke werkgroep M | Vervoerregio M, | 6 | 3 | 2 | 7 | 2 | 0 | 0 | 1 | 1 | 1 |
| 162 | Burgemeesters | Vervoerregio M, Vervoercollege, COBUR | 10 | 3 | 2 | 7 | 3 | 0 | 1 | 1 | 1 | 1 |
| 163 | COBUR | IGEMO, Vervoerregio M, SWV BR, Vervoercollege, G. Vaganée, B. Somers, | 4 | 3 | 3 | 7 | 2 | 0 | 1 | 1 | 1 | 1 |
| 164 | Gemeenten M | Vervoerregio M, Vervoerregioeend, IGEMO, Prov A, Prov VI-B, Gemeenten BR, | 10 | 3 | 1 | 24 | 3 | 0 | 0 | 1 | 1 | 1 |
| 186 | Kernoverleg | Vervoerregio M, De Lijn, DMOW, AWV, MAV, Vervoerregioeend M, | 6 | 3 | 2 | 4 | 3 | 0 | 0 | 1 | 1 | 1 |
| 187 | Kleinbondgroep | Vervoerregio M | 4 | 3 | 1 | 2 | 2 | 0 | 0 | 1 | 1 | 1 |
| 188 | Mobiliteitsplan M | Vervoerregio M, The New Drive, APPM, IMOB, Goudappel Coffeng | 6 | 3 | 2 | 24 | 7 | 0 | 0 | 1 | 1 | 1 |
| 189 | Vervoerregioeend M | Burgenbewegingen, Middenveld, Vervoerregio M, Kernoverleg, Vervoercollege, The New Drive, APPM, IMOB, Goudappel Coffeng | 6 | 3 | 2 | 29 | 7 | 0 | 0 | 1 | 1 | 1 |
| 190 | Vervoercollege | Vervoerregioeend, Open Vid, N-VA, CD&V, B. Somers (Open Vid), G. Vaganée (N-VA), N. Sminate (N-VA), K. Van den Heuvel (CD&V), L. Vleugels (CD&V) | 6 | 3 | 2 | 5 | 3 | 0 | 0 | 1 | 1 | 1 |
| 191 | B. Somers | Open Vid, Mechelen, COBUR | 10 | 3 | 2 | 4 | 2 | 0 | 1 | 1 | 1 | 1 |
| 192 | G. Vaganée | N-VA, Fietsstraten, Gemeenten M, Vervoercollege, Vervoerregioeend M, F. Leys, COBUR, Beloningsprojecten, | 10 | 3 | 2 | 13 | 3 | 0 | 1 | 1 | 1 | 1 |
| 196 | Vervoerregio W | Gemeenten W, Vervoerregioeend W, Mobiliteitsplan W, | 6 | 3 | 2 | 10 | 5 | 0 | 0 | 1 | 1 | 1 |
| 198 | Mobiliteitsplan W | Gemeenten W, | 6 | 3 | 2 | 3 | 3 | 0 | 0 | 0 | 1 | 1 |
| 199 | Vervoerregioeend W | Gemeenten W, Traject | 6 | 3 | 2 | 8 | 3 | 0 | 0 | 0 | 0 | 0 |
| 200 | VO | Gem Rott, HbR, MM_R, MRDH, RWS, Spitsmijdingen, Rebel, SWV BR, | 6 | 3 | 3 | 4 | 3 | 1 | 1 | 1 | 1 | 1 |
| 203 | MM_R | VO, MM_M, MM_A, | 13 | 3 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 1 |
| 204 | MRDH | VO | 13 | 3 | 3 | 2 | 2 | 1 | 1 | 1 | 1 | 1 |
| 206 | Spitsmijdingen | VO, SWV BR, Vervoerregio's, MM_R, MM_M, MM_A, Mobiliteitsgedrag verandering | 3 | 3 | 1 | 4 | 2 | 1 | 1 | 1 | 1 | 1 |
| 207 | IGEMO | SWV BR, W. Abels, W. Van Hoof, Ambtelijke werkgroep, Vervoerregioeend, Mandaatgroep, MM_M, Gemeenten M, | 4 | 3 | 1 | 39 | 5 | 1 | 1 | 1 | 1 | 1 |
| 208 | W. Abels | IGEMO, SWV BR, MM_M, Mobiliteitsconferentie, | 4 | 3 | 1 | 10 | 3 | 0 | 1 | 1 | 1 | 1 |
| 210 | SWV BR | Engagementsverklaring BR, Mandaatgroep, Ambtelijke werkgroep, Beleidsgroep, Mobiliteit, Gemeenten BR, IGEMO, Logistieke Kaart, Gemeenten BR, Regionet Mechelen, Masterplan BR, MM_Mechelen, Vervoerregio M, | 2 | 3 | 2 | 42 | 4 | 0 | 0 | 1 | 1 | 1 |
| 211 | Ambtelijke werkgroep BR | The New Drive, IMOB, APPM, Goudappel Coffeng, DMOW, Vervoerregio M, | 2 | 3 | 2 | 3 | 2 | 0 | 0 | 1 | 1 | 1 |
| 213 | Engagementsverklaring BR | SWV BR, Gemeenten BR, IGEMO, | 2 | 3 | 2 | 5 | 3 | 0 | 0 | 1 | 1 | 1 |
| 214 | Gemeenten BR | IGEMO, Berlaar, Bonheiden, Bornem, Duffel, Heist-op-den-Berg, Lier, Mechelen, Nijlen, Putte, Puurs, Sint-Amands, Sint-Katelijne-Waver, Wilfebrouk | 10 | 3 | 1 | 10 | 2 | 0 | 0 | 1 | 1 | 1 |
| 215 | Logistieke Kaart | Agentschap Ondernemen, IGEMO, Vreuchtverkeer, SWV BR, Gemeenten BR, Voke, Unizo, Belangengroepen | 3 | 3 | 2 | 5 | 3 | 0 | 1 | 1 | 1 | 1 |
| 216 | Mandaatgroep | Gemeenten BR, IGEMO, Vervoerregioeend M, | 13 | 3 | 2 | 10 | 2 | 0 | 0 | 1 | 1 | 1 |
| 217 | MM_M | IGEMO, SWV BR, | 13 | 3 | 1 | 11 | 3 | 0 | 0 | 1 | 1 | 1 |
| 218 | Masterplan BR | Gemeenten BR, IGEMO, Mobiliteitsplan M, Vervoerregio M, Burgerorganisaties, | 6 | 3 | 2 | 19 | 3 | 0 | 0 | 0 | 1 | 1 |
| 219 | Mobiliteitsconferentie | Belangengroepen, Middenveld, Gemeenten BR, SWV BR, | 4 | 3 | 3 | 4 | 3 | 0 | 0 | 1 | 1 | 1 |

Table 14 Overview of the selected actors, their connections, and attributes in the case of the VO.

| ID_VO | Actor | Connecties | TTTE_N um | BCPK_N um | NRL_N um | Nr. CodSou rces | Nr. CodRef | Phase |
|-------|-------------------------------|--|--------------|--------------|-------------|-----------------------|---------------|-------|
| 2 | Aanbodsmatregelen | A15, Blankenburgverbinding, Masterplan Antwerpen, Oosterweelverbinding, Noordenlijn, | 3 | 0 | 2 | 6 | 205 | 1 |
| 3 | A15 | De Verkeersonderneming, HbR, | 3 | 0 | 2 | 5 | 20 | 1 |
| 4 | Blankenburgverbinding | IenM, MIRT, HbR, Tracéwet | 3 | 0 | 2 | 2 | 3 | 3 |
| 5 | Masterplan Antwerpen | Stad Antwerpen, Oosterweelverbinding, BAM, AWW, DMOW, Provincie Antwerpen | 6 | 0 | 2 | 2 | 10 | 1 |
| 6 | Oosterweelverbinding | Poort Oost, Provincie Antwerpen, ProjectMER Oosterweel, Masterplan Antwerpen, | 3 | 0 | 2 | 3 | 13 | 1 |
| 10 | Noordenlijn | Stad Antwerpen, M. De Roeck, Masterplan Antwerpen, BAM, De Lijn, | 3 | 0 | 2 | 1 | 8 | 2 |
| 12 | RET | MRDH | 3 | 1 | 2 | 3 | 4 | 1 |
| 15 | Mobiliteitsgedrag verandering | Vraagmaatregelen, Mobiliteitsmarkt Antwerpen, Mobiliteitsmarkt Rotterdam, Slim naar Antwerpen, Filedier campagne, | 4 | 0 | 1 | 6 | 82 | 1 |
| 16 | Bewonenseaankpak | Slim naar Antwerpen, De Verkeersonderneming, Filedier campagne, | 5 | 2 | 1 | 3 | 5 | 1 |
| 17 | Filedier campagne | De Verkeersonderneming, H. Stevens, A. Van der Bend, R. Boshouwers, Mobiliteitsmarkt Rotterdam, Mobiliteitsgedrag verandering | 4 | 3 | 1 | 2 | 5 | 2 |
| 18 | Slim Naar Antwerpen | Stad Antwerpen, Masterplan Antwerpen, M. De Roeck, | 5 | 3 | 1 | 2 | 13 | 3 |
| 19 | Werkgeversaankpak | Deltalinqs, VNO-NCW | 4 | 0 | 1 | 4 | 14 | 1 |
| 20 | Spitamijsdijingen | De Verkeersonderneming, Beter Benutten I, Beter Benutten Vervolg, A15 | 3 | 0 | 1 | 6 | 25 | 1 |
| 22 | MIRT | IenM, Aanbodsmatregelen, Blankenburgverbinding, A15, | 13 | 3 | 2 | 4 | 4 | 1 |
| 27 | Tweede Kamer | IenM, Minister Infrastructuur en Milieu, Beter Benutten I, Beter Benutten Vervolg, HbR, Deltalinqs, VNO NCW, ECT, Raad Van Advies | 4 | 3 | 3 | 4 | 4 | 1 |
| 28 | Bedrijfsleven | HbR, Deltalinqs, VNO NCW, ECT, Raad Van Advies | 8 | 1 | 2 | 6 | 33 | 1 |
| 33 | MaaS | Mobiliteitsmarkt Rotterdam, Mobiliteitsmarkt Antwerpen, De Verkeersonderneming, | 13 | 1 | 1 | 5 | 7 | 1 |
| 35 | Deltalinqs | Bedrijfsleven, J. Nagtegaal, Raad Van Advies, Werkgeversaankpak | 4 | 1 | 3 | 2 | 3 | 1 |
| 39 | VNO NCW | Deltalinqs, C. Bieringa, Raad Van Advies, Bedrijfsleven, | 4 | 1 | 3 | 4 | 5 | 1 |
| 43 | Mobiliteitsmarkt Antwerpen | M. De Roeck, R. Boshouwers, HbA, Voka, Voka alfaport, Stad Antwerpen, Slim Naar Antwerpen, Mobiliteitsmarkt Rotterdam | 13 | 3 | 1 | 3 | 29 | 3 |
| 46 | M. De Roeck | Stad Antwerpen, Mobiliteitsmarkt Antwerpen | 13 | 3 | 1 | 1 | 6 | 3 |
| 50 | Mobiliteitsmarkt Rotterdam | De Verkeersonderneming, MaaS, H. Stevens, R. Boshouwers, Rebel, | 13 | 3 | 1 | 5 | 37 | 2 |
| 59 | Burgens-gebruikers | Bewonenseaankpak, Filedier campagne, Slim naar Antwerpen, Mobiliteitsgedrag verandering, MaaS, Mobiliteitsmarkt Rotterdam, Mobiliteitsmarkt Antwerpen, | 13 | 2 | 1 | 3 | 6 | 1 |
| 63 | Rebel | R. Boshouwers, BAM, Oosterweelverbinding, M. De Roeck, H. Stevens, De | 4 | 4 | 1 | 3 | 13 | 1 |
| 64 | R. Boshouwers | Verkeersonderneming, Mobiliteitsmarkt Antwerpen, Mobiliteitsmarkt Rotterdam, Rebel, Stad Antwerpen, | 13 | 4 | 1 | 3 | 10 | 1 |
| 69 | Gemeentebesturen | Gemeente Rotterdam, Gemeente Den Haag, Provinciebesturen, Intergemeentelijke samenwerkingen, Interbestuurlijke samenwerkingen, Stad Antwerpen, Provincie Antwerpen, Provincie Zuid-Holland, Vervoerregio Antwerpen, MRDH, Vervoerregio Annhem-Nijmegen, Vervoer | 10 | 3 | 2 | 6 | 14 | 1 |
| 71 | Gemeente Rotterdam | Gemeentebesturen, MRDH, Vervoerregio Rotterdam, Wethouder Verkeer & Vervoer, B. Postma, H. Stevens, HbR, De | 10 | 3 | 2 | 5 | 30 | 1 |
| 72 | B. Postma | Verkeersonderneming, Moederorganisaties, IenM, BDU, Beter Benutten I, Beter Benutten Vervolg, MIRT Gemeente Rotterdam, Accounthoudersoverleg, De Verkeersonderneming, H. Stevens, N. Ammerlaan, J. Bus, A. Van den Bend, L. Schrijnen, J.W. Immerzeel, J. Gouwetak, H. Smits, Portefeuillehouder Verkeer & Vervoer, | 5 | 3 | 2 | 2 | 5 | 1 |

| | | | | | | | | |
|-----|---------------------------------------|---|----|---|---|---|----|---|
| 74 | Wethouder Verkeer & Vervoer | Gemeente Rotterdam, Burgemeester Rotterdam, M. De Roeck, BAM, Oosterweelverbinding, ProjectMER Oosterweel, Noorderlijn, K. Kennis, DMOW, AWV, Slim naar Antwerpen, De Verkeersonderneming, BB-Maastricht | 10 | 3 | 2 | 2 | 3 | 1 |
| 75 | Stad Antwerpen | Stad Antwerpen, N-VA, BAM, Oosterweelverbinding, Toekomstverbond, Intendant, | 13 | 3 | 2 | 3 | 24 | 2 |
| 76 | K. Kennis | BAM, K. Kennis, Stad Antwerpen, Oosterweelverbinding, Noorderlijn, Slim naar Antwerpen, Mobiliteitsmarkt Antwerpen, E-bus | 10 | 3 | 2 | 2 | 6 | 2 |
| 77 | HbA | Water taxi, moederorganisaties, accounthoudersoverleg, De Verkeersonderneming, F. Bus, N. Ammerlaan, H. Smits, directeur VO, Mobiliteitsmarkt Rotterdam, Beter Benutten I, Beter Benutten Vervolg, SOK, Bereikbaarheidsverklaring | 10 | 3 | 2 | 5 | 42 | 1 |
| 78 | HbR | HbR, N. Ammerlaan, De Verkeersonderneming, H. Smits, J. Gouwetak, H. Stevens, Mobiliteitsmarkt Rotterdam | 13 | 3 | 1 | 3 | 3 | 1 |
| 79 | F. Bus | HbR, Minister van Infrastructuur en Milieu, De Verkeersonderneming, Beter Benutten I, Beter Benutten Vervolg, Stuurgroep | 10 | 3 | 2 | 3 | 4 | 1 |
| 80 | H. Smits | M. De Roeck, R. Boshouwers, Rebel, Oosterweelverbinding, De Lijn, HbA, De Verkeersonderneming, | 3 | 3 | 2 | 4 | 19 | 1 |
| 83 | BAM | Gemeente Rotterdam, Gemeente Den Haag, J.W. Immerzeel, Vervoerregio Rotterdam, Vervoerregio Den Haag, Portefeuillehouder Verkeer & Vervoer, moederorganisaties, Beter Benutten I, Beter Benutten Vervolg, RET, HTM | 13 | 3 | 2 | 5 | 39 | 1 |
| 85 | MRDH | Stuurgroep, MRDH, Wethouder Verkeer & Vervoer, Bestuurlijk Trio, Beter Benutten I, Beter Benutten Vervolg | 13 | 3 | 2 | 3 | 4 | 1 |
| 87 | Portefeuillehouder Verkeer en Vervoer | MRDH, Vervoerregio's, Provincie Zuid-Holland, Gemeente Den Haag, De Verkeersonderneming, Beter Benutten I, Beter Benutten Vervolg, RWS, HTM | 13 | 3 | 2 | 4 | 7 | 1 |
| 89 | Vervoerregio Den Haag | MRDH, Gemeente Rotterdam, Vervoerregio's, Provincie Zuid-Holland, RWS, RET | 13 | 3 | 2 | 5 | 8 | 1 |
| 90 | Vervoerregio Rotterdam | Vervoerregio's, Beter Benutten I, Beter Benutten Vervolg | 13 | 3 | 2 | 3 | 6 | 1 |
| 92 | Vervoerregio Amsterdam | DMOW, AWV, De Lijn, Gemeentebesturen, Vervoerregio's, NMBS | 13 | 3 | 2 | 2 | 4 | 3 |
| 93 | Vervoerregio Antwerpen | Vervoerregio's, Brabantstad, R. Boshouwers RWS, Minister van Infrastructuur en Milieu, directeur VO, M. Oosterbaan, Beter Benutten I, Beter Benutten Vervolg, Beter Benutten III - Verankering, Mobiliteitsgedrag verandering, MIRT, SDU, | 13 | 3 | 2 | 5 | 38 | 1 |
| 95 | Vervoerregio Brabant | Beter Benutten I, Beter Benutten Vervolg, CEO bedrijfaleven, L. Ruijs, Minister van Infrastructuur en Milieu, Portefeuillehouder Verkeer & Vervoer, | 13 | 5 | 2 | 4 | 6 | 2 |
| 101 | IenM | IenM, Mobiliteitsgedrag verandering, filedier campagne, De Verkeersonderneming, Provinciebesturen, Vervoerregio's, M. Oosterbaan, Vervoerregio Rotterdam, Vervoerregio Den Haag, Vervoerregio Brabant, Vervoerregio Utrecht, Vervoerregio Eindhoven, Vervoerreg | 13 | 3 | 2 | 5 | 9 | 2 |
| 102 | Bestuurlijk Trio | O. Van den Veen, IenM, M. Oosterbaan, Beter Benutten I, Beter Benutten Vervolg, HbR, De Verkeersonderneming, Vervoerregio Rotterdam, Vervoerregio Den Haag, Vervoerregio Brabant, Vervoerregio Utrecht, Vervoerregio Eindhoven, Vervoerregio Arnhem-Nijmegen, B | 13 | 3 | 2 | 4 | 6 | 3 |
| 103 | Beter Benutten I | | | | | | | |
| 104 | Beter Benutten III - Verankering | | | | | | | |

| | | | | | | | | |
|-----|---------------------------------------|--|----|---|---|---|----|---|
| 106 | Beter Benutten Vervolg | Beter Benutten I, Beter Benutten III - Verankering, IenM, Vervoerregio Rotterdam, Vervoerregio Den Haag, Vervoerregio Brabant, Vervoerregio Utrecht, Vervoerregio Eindhoven, Vervoerregio Arnhem-Nijmegen, BS-Maastricht, Vervoerregio Rotterdam, Vervoerregio Den Haag, De Verkeersonderneming, Beter Benutten I, Beter Benutten Vervolg, IenM, DG Bereikbaarheid | 13 | 3 | 2 | 5 | 11 | 3 |
| 107 | M. Oosterbaan | IenM, Stuurgroep, Bestuurlijk Trio, Raad Van Advies, Stuurgroep, HID RWS, Moederorganisaties, Accounthoudersoverleg, Aanbodsmatregelen | 13 | 3 | 2 | 2 | 3 | 2 |
| 109 | Minister van Infrastructuur en Milieu | De Lijn, DMOW, AWW, BAM, Stad Antwerpen, Masterplan Antwerpen, Vervoerregio Antwerpen, Vervoerregio Mechelen, Provinciebesturen, Stad Antwerpen, Vervoerregio Antwerpen, Poort Oost, Provinciale administratie | 13 | 3 | 2 | 4 | 6 | 1 |
| 111 | RWS | C. Berx (CD&V), I. Verhaert (sp.a), L. Lemmens (N-VA), Poort Oost, Oosterweelverbinding, Streefbeeldstudie RT1, Stad Antwerpen, gemeentebesturen, Masterplan Antwerpen, Vervoerregio Antwerpen | 3 | 3 | 2 | 5 | 27 | 1 |
| 113 | NMBS | Oosterweelverbinding, Provincie Antwerpen, Stad Antwerpen, gemeentebesturen, Vervoerregio Antwerpen, BAM, directeur VO, Stichting VO, L. Schrijnen, HbR, H. Moons, R. Demkes, A. Van der Bend, Moederorganisaties, RWS, IenM, HbR, Gemeente Rotterdam, MRDH, Beter Benutten I, Beter Benutten Vervolg, Raad Van Advies, Stuurgroep, Accounthoudersoverleg, R. Boshou | 6 | 3 | 2 | 2 | 6 | 3 |
| 116 | Provincie Antwerpen | De Verkeersonderneming, B. Postma, J. Gouwetask, J.W. Immerzeel, A. Van der Bend, directeur VO, A. Van der Bend, H. Moons, R. Demkes, L. Schrijnen, Stichting VO, Filedien campagne, Directeur VO, Mobiliteitsmarkt Rotterdam, NG Infra, RWS, Blankenburgverbinding, directeur VO, Directeur VO, Bedrijfsleven | 11 | 3 | 3 | 2 | 7 | 2 |
| 117 | Gouverneur | Directeur VO, Gemeente Rotterdam, De Verkeersonderneming, Mobiliteitsmarkt Rotterdam, R. Boshouwers | 4 | 3 | 3 | 1 | 4 | 1 |
| 120 | Poort Oost | HbR, RWS, IenM, Gemeente Rotterdam, MRDH, Beter Benutten I, Beter Benutten Vervolg, Raad Van Advies, Stuurgroep, Accounthoudersoverleg, R. Boshou | 4 | 3 | 3 | 1 | 5 | 2 |
| 123 | Verkeersonderneming | De Verkeersonderneming, B. Postma, J. Gouwetask, J.W. Immerzeel, A. Van der Bend, directeur VO, A. Van der Bend, H. Moons, R. Demkes, L. Schrijnen, Stichting VO, Filedien campagne, Directeur VO, Mobiliteitsmarkt Rotterdam, NG Infra, RWS, Blankenburgverbinding, directeur VO, Directeur VO, Bedrijfsleven | 13 | 3 | 2 | 6 | 91 | 1 |
| 124 | Accounthoudersoverleg | Directeur VO, Gemeente Rotterdam, De Verkeersonderneming, Mobiliteitsmarkt Rotterdam, R. Boshouwers | 13 | 3 | 2 | 3 | 11 | 1 |
| 125 | Directeur VO | HbR, RWS, IenM, Gemeente Rotterdam, MRDH, Bedrijfsleven, VNO NCW, RWS, Gemeente Rotterdam, Provincie Zuid-Holland, HbR | 13 | 3 | 2 | 4 | 26 | 1 |
| 126 | A. Van der Bend | HbR, RWS, Gemeente Rotterdam, MRDH, De Verkeersonderneming, De Verkeersonderneming, Stuurgroep, Directeur VO, Directeur VO, De Verkeersonderneming, Minister IenM, Wethouder Verkeer en Vervoer, Gemeente Rotterdam, MRDH, HbR, RWS, SOK | 13 | 3 | 2 | 4 | 7 | 2 |
| 127 | H. Moons | DMOW, Masterplan Antwerpen, De Lijn, F. Leys, Vervoerregio Antwerpen, Vervoerregio Mechelen, Slim naar Antwerpen, Mobiliteitsmarkt Antwerpen, Stad Antwerpen | 3 | 3 | 2 | 2 | 3 | 3 |
| 128 | L. Schrijnen | AWW, DMOW, Slim Naar Antwerpen, Masterplan Antwerpen, Stad Antwerpen, AWV, F. Leys, Vervoerregio Mechelen, Vervoerregio Antwerpen, Vervoerregio's, BAM, Masterplan Antwerpen, Stad Antwerpen, Mobiliteitsmarkt Antwerpen, | 3 | 3 | 2 | 3 | 5 | 1 |
| 129 | R. Demkes | Directeur VO, Gemeente Rotterdam, De Verkeersonderneming, Mobiliteitsmarkt Rotterdam, R. Boshouwers | 13 | 3 | 2 | 3 | 3 | 3 |
| 130 | H. Stevens | HbR, RWS, Gemeente Rotterdam, MRDH, De Verkeersonderneming, De Verkeersonderneming, Stuurgroep, Directeur VO, Directeur VO, De Verkeersonderneming, Minister IenM, Wethouder Verkeer en Vervoer, Gemeente Rotterdam, MRDH, HbR, RWS, SOK | 13 | 4 | 1 | 4 | 4 | 1 |
| 131 | Moederorganisaties | DMOW, Masterplan Antwerpen, De Lijn, F. Leys, Vervoerregio Antwerpen, Vervoerregio Mechelen, Slim naar Antwerpen, Mobiliteitsmarkt Antwerpen, Stad Antwerpen | 13 | 3 | 2 | 5 | 29 | 1 |
| 132 | Raad van advies | HbR, RWS, Gemeente Rotterdam, MRDH, De Verkeersonderneming, De Verkeersonderneming, Stuurgroep, Directeur VO, Directeur VO, De Verkeersonderneming, Minister IenM, Wethouder Verkeer en Vervoer, Gemeente Rotterdam, MRDH, HbR, RWS, SOK | 13 | 5 | 3 | 4 | 4 | 1 |
| 133 | SOK | DMOW, Masterplan Antwerpen, De Lijn, F. Leys, Vervoerregio Antwerpen, Vervoerregio Mechelen, Slim naar Antwerpen, Mobiliteitsmarkt Antwerpen, Stad Antwerpen | 13 | 3 | 2 | 3 | 12 | 1 |
| 134 | Stichting VO | De Verkeersonderneming, Stuurgroep, Directeur VO, Directeur VO, De Verkeersonderneming, Minister IenM, Wethouder Verkeer en Vervoer, Gemeente Rotterdam, MRDH, HbR, RWS, SOK | 13 | 3 | 2 | 5 | 11 | 1 |
| 135 | Stuurgroep | DMOW, Masterplan Antwerpen, De Lijn, F. Leys, Vervoerregio Antwerpen, Vervoerregio Mechelen, Slim naar Antwerpen, Mobiliteitsmarkt Antwerpen, Stad Antwerpen | 13 | 3 | 2 | 5 | 9 | 1 |
| 138 | AWV | DMOW, Masterplan Antwerpen, De Lijn, F. Leys, Vervoerregio Antwerpen, Vervoerregio Mechelen, Slim naar Antwerpen, Mobiliteitsmarkt Antwerpen, Stad Antwerpen | 3 | 3 | 2 | 3 | 13 | 1 |
| 139 | De Lijn | AWV, DMOW, Slim Naar Antwerpen, Masterplan Antwerpen, Stad Antwerpen, AWV, F. Leys, Vervoerregio Mechelen, Vervoerregio Antwerpen, Vervoerregio's, BAM, Masterplan Antwerpen, Stad Antwerpen, Mobiliteitsmarkt Antwerpen, | 2 | 3 | 2 | 2 | 8 | 1 |
| 140 | De Vlaamse Waterweg nv | AWV, F. Leys, Vervoerregio Mechelen, Vervoerregio Antwerpen, Vervoerregio's, BAM, Masterplan Antwerpen, Stad Antwerpen, Mobiliteitsmarkt Antwerpen, | 3 | 3 | 2 | 1 | 4 | 1 |
| 141 | DMOW | DMOW, Masterplan Antwerpen, De Lijn, F. Leys, Vervoerregio Antwerpen, Vervoerregio Mechelen, Slim naar Antwerpen, Mobiliteitsmarkt Antwerpen, Stad Antwerpen | 2 | 3 | 2 | 2 | 11 | 1 |

11.3

Case LIP Oosterweel Link

11.3.1 Governmental side (BAM)

The coded documents resulted in the identification of 198 actors in the Oosterweel Link case. In order to optimise the visualisation of the actor network in the case a selection of this total number was applied. The following selection criteria were used. Actors had to be coded in at least 10 separate coding references, or had to show up in at least two source documents. This means in practice that within one document a certain actor should appear at least at ten pages, because coding happened more or less per page, but also took into account subdivisions of the parliamentary committee minutes. Or the actor should appear in at least two different parliamentary committee minute documents. As such the actor proofs to be relevant over the years and thus for the LIP-process. As such, a number of 110 (f) actors was included in the actor network visualisations. Table 15 gives an overview of the coded parliamentary committee minutes. An overview of the (f)actors, their connections and the other attributes is provided in Table 16.

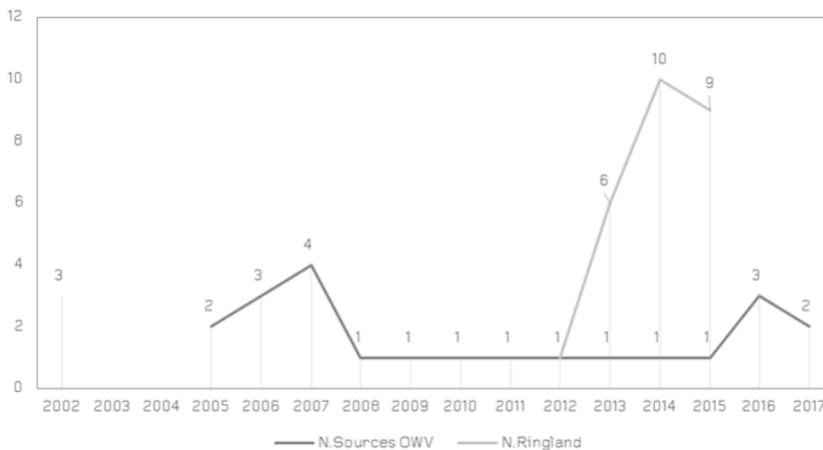


Figure 97 Distribution of sources according to Oosterweel Link or Ringland over time.

Table 15 Overview of the coded sources for the Oosterweel Link (governmental side).

| Year | Month | Type | Titel | Nr. of pages | Source | Coded | Nodes | References |
|------|-----------|---------------------------------|---|--------------|---------------------------------------|-------|-------|------------|
| 2002 | November | Parliamentary commission report | ONTWERP VAN DECREET houdende de oprichting van de naamloze vennootschap van publiek recht Beheersmaatschappij Antwerpen Mobiel (BAM) VERSLAG namens de Commissie voor Openbare Werken, Mobiliteit en Energie uitgebracht door de heer Ludwig Caluwé | 59 | Vlaams parlement | Yes | 105 | 803 |
| 2002 | September | Draft decree | ONTWERP VAN DECREET houdende de oprichting van de naamloze vennootschap van publiek recht Beheersmaatschappij Antwerpen Mobiel (BAM) | 41 | Vlaams parlement | Yes | 11 | 25 |
| 2003 | February | Decree | Decreet houdende de oprichting van de naamloze vennootschap van publiek recht Beheersmaatschappij Antwerpen Mobiel (1) | 3 | Ministerie van de Vlaamse Gemeenschap | Yes | 5 | 8 |
| 2005 | March | Parliamentary commission report | BEHEERSMAATSCHAPPIJ ANTWERPEN MOBIEL (BAM) – GROTE INFRASTRUCTUURPROJECTEN HOORZITTING VERSLAG namens de Commissie voor Openbare Werken, Mobiliteit en Energie, uitgebracht door de heer Jan Peumans | 97 | Vlaams Parlement | Yes | 194 | 1822 |
| 2005 | June | Parliamentary commission report | BEHEERSMAATSCHAPPIJ ANTWERPEN MOBIEL (BAM) – GROTE INFRASTRUCTUURPROJECTEN EERSTE VOORTGANGSRAPPORTAGE Juni 2005 VERSLAG namens de Commissie voor Openbare Werken, Mobiliteit en Energie uitgebracht door de heren Jan Peumans en Jan Pennis | 55 | Vlaams Parlement | Yes | 128 | 1294 |
| 2006 | May | Parliamentary commission report | BEHEERSMAATSCHAPPIJ ANTWERPEN MOBIEL (BAM) – GROTE INFRASTRUCTUURPROJECTEN DERDE VOORTGANGSRAPPORTAGE Maart 2006 VERSLAG namens de Commissie voor Openbare Werken, Mobiliteit en Energie uitgebracht door de heren Jan Pennis en Jan Peumans | 99 | Vlaams Parlement | Yes | 146 | 1940 |
| 2008 | July | Parliamentary commission report | BEHEERSMAATSCHAPPIJ ANTWERPEN MOBIEL (BAM) – GROTE INFRASTRUCTUURPROJECTEN VIERDE VOORTGANGSRAPPORTAGE Juni 2007 VERSLAG namens de Commissie voor Openbare Werken, Mobiliteit en Energie uitgebracht door de heren Jan Peumans en Jan Pennis | 23 | Vlaams Parlement | Yes | 118 | 1488 |
| 2008 | November | Court of Audit report | BEHEERSMAATSCHAPPIJ ANTWERPEN MOBIEL (BAM) – GROTE INFRASTRUCTUURPROJECTEN VERSLAG – van het Rekenhof – Vijfde voortgangsaaportage van de Beheersmaatschappij Antwerpen Mobiel inzake het Masterplan Antwerpen | 23 | Vlaams Parlement | Yes | 36 | 114 |
| 2007 | March | Parliamentary commission report | BEHEERSMAATSCHAPPIJ ANTWERPEN MOBIEL (BAM) GROTE INFRASTRUCTUURPROJECTEN ACHTSTE VOORTGANGSRAPPORTAGE Maart 2007 VERSLAG namens de Commissie voor Openbare Werken, Mobiliteit en Energie uitgebracht door de heren Jan Pennis en Jan Peumans | 397 | Vlaams Parlement | Yes | 135 | 1791 |
| 2007 | June | Court of Audit report | BEHEERSMAATSCHAPPIJ ANTWERPEN MOBIEL (BAM) – GROTE INFRASTRUCTUURPROJECTEN VERSLAG – van het Rekenhof – Zevende voortgangsaaportage van de Beheersmaatschappij Antwerpen Mobiel inzake het Masterplan Antwerpen | 22 | Vlaams Parlement | Yes | 55 | 280 |
| 2007 | August | Parliamentary commission report | BEHEERSMAATSCHAPPIJ ANTWERPEN MOBIEL (BAM) GROTE INFRASTRUCTUURPROJECTEN ZEVENDE VOORTGANGSRAPPORTAGE Juni 2007 VERSLAG namens de Commissie voor Openbare Werken, Mobiliteit en Energie uitgebracht door de heren Jan Pennis en Jan Peumans | 189 | Vlaams Parlement | Yes | 191 | 3197 |
| 2007 | December | Parliamentary commission report | BEHEERSMAATSCHAPPIJ ANTWERPEN MOBIEL (BAM) GROTE INFRASTRUCTUURPROJECTEN ACHTSTE VOORTGANGSRAPPORTAGE November 2007 VERSLAG namens de Commissie voor Openbare Werken, Mobiliteit en Energie uitgebracht door de heren Jan Pennis en Jan Peumans | 83 | Vlaams Parlement | Yes | 167 | 2110 |
| 2008 | April | Parliamentary commission report | BEHEERSMAATSCHAPPIJ ANTWERPEN MOBIEL (BAM) GROTE INFRASTRUCTUURPROJECTEN NEGEDE VOORTGANGSRAPPORTAGE Maart 2008 VERSLAG namens de Commissie voor Openbare Werken, Mobiliteit en Energie uitgebracht door de heren Jan Pennis en Jan Peumans | 138 | Vlaams Parlement | Yes | 230 | 4817 |
| 2009 | April | Parliamentary commission report | BEHEERSMAATSCHAPPIJ ANTWERPEN MOBIEL (BAM) GROTE INFRASTRUCTUURPROJECTEN TWAALFDE VOORTGANGSRAPPORTAGE Maart 2009 VERSLAG namens de Commissie voor Openbare Werken, Mobiliteit en Energie uitgebracht door de heren Jan Pennis en Jan Peumans | 21 | Vlaams Parlement | Yes | 145 | 1280 |
| 2010 | February | Parliamentary commission report | BEHEERSMAATSCHAPPIJ ANTWERPEN MOBIEL (BAM) GROTE INFRASTRUCTUURPROJECTEN DERTIENDE VOORTGANGSRAPPORTAGE Januari 2010 Verslag namens de Commissie voor Mobiliteit en Openbare Werken uitgebracht door de heren Jan Pennis en Dirk de Kort | 214 | Vlaams Parlement | Yes | 208 | 3782 |
| 2011 | May | Parliamentary commission report | Verslag van de Vlaamse Regering over het Masterplan 2020 Basisaaportage Verslag van het Rekenhof | 20 | Vlaams Parlement | Yes | 89 | 832 |
| 2012 | January | Parliamentary commission report | Verslag van de Vlaamse Regering over het Masterplan 2020 Eerste voortgangsaaportage Verslag namens de Commissie voor Mobiliteit en Openbare Werken uitgebracht door de heren Jan Pennis en Dirk de Kort | 139 | Vlaams Parlement | Yes | 188 | 2254 |
| 2013 | June | Parliamentary commission report | Verslag van de Vlaamse Regering over het Masterplan 2020 Vijfde voortgangsaaportage Verslag namens de Commissie voor Mobiliteit en Openbare Werken uitgebracht door de heren Jan Pennis en Dirk de Kort | 32 | Vlaams Parlement | Yes | 189 | 1834 |
| 2014 | January | Parliamentary commission report | Verslag van de Vlaamse Regering over het Masterplan 2020 Vijfde voortgangsaaportage Verslag namens de Commissie voor Mobiliteit en Openbare Werken uitgebracht door de heren Jan Pennis en Dirk de Kort | 29 | Vlaams Parlement | Yes | 194 | 1424 |
| 2015 | February | Parliamentary commission report | Verslag namens de Commissie voor Mobiliteit en Openbare Werken uitgebracht door de heren Dirk de Kort en Wouter Vanbesien over het verslag van de Vlaamse Regering over het Masterplan 2020 Zevende voortgangsaaportage | 26 | Vlaams Parlement | Yes | 209 | 1928 |
| 2016 | May | Report Flemish Government | Verslag van de Vlaamse Regering over het Masterplan 2020 Tiende voortgangsaaportage | 38 | Vlaams parlement | Yes | 88 | 227 |
| 2016 | September | Parliamentary commission report | Verslag namens de Commissie voor Mobiliteit en Openbare Werken uitgebracht door Yasmina Oerbach en Annick De Ridder over het verslag van de Vlaamse Regering over het Masterplan 2020 Tiende voortgangsaaportage | 40 | Vlaams parlement | Yes | 140 | 1265 |
| 2016 | September | Parliamentary commission report | Verslag namens de Commissie voor Mobiliteit en Openbare Werken uitgebracht door Yasmina Oerbach en Annick De Ridder over het verslag van de Vlaamse Regering over het Masterplan 2020 Tiende voortgangsaaportage | 41 | Vlaams parlement | Yes | 211 | 2281 |
| 2017 | January | Report Flemish Government | Verslag van de Vlaamse Regering over het Masterplan 2020 Elfde voortgangsaaportage | 30 | Vlaams parlement | Yes | 69 | 203 |
| 2017 | March | Parliamentary commission report | Verslag namens de Commissie voor Mobiliteit en Openbare Werken uitgebracht door Wouter Vanbesien en Annick De Ridder over het verslag van de Vlaamse Regering over het Masterplan 2020 Elfde voortgangsaaportage | 35 | Vlaams parlement | Yes | 172 | 1084 |
| 2017 | June | Written question | Schriftelijke vraag van Koen Daniels aan Ben Weyts: Toekomstverbond voor de mobiliteit en leefbaarheid van Antwerpen Vertegenwoordiging Waalens (2) | 2 | Vlaams parlement | Yes | 49 | 54 |
| 2017 | June | Report Flemish Government | Verslag van de Vlaamse Regering over de uitvoering van het toekomstverbond voor bereikbaarheid en leefbaarheid 15 juni 2017 | 84 | Vlaams parlement | Yes | 181 | 835 |

| Nr. | Actor | BAM_Connecties | TITE_Num | BCPK_Num | NRL_Num | BAM_N_CodRef | BAM_N_Sources | Years | In_AN |
|-----|---------------------------|---|----------|----------|---------|--------------|---------------|--|-------|
| 84 | Cooperation Southern Ring | Intendant O'Hooghe, Ademoos, sTRaten-generaal, Ringland, Ringland Academy, DLNE, DMOW, BAM, J. Van Rensbergen, B. De Bondt, D. Stevens, Manu Claeys, Peter Vermeulen, Wim Van Hees, Portof A, B. Weys, B. Van Camp, Koen Kennis, Stad A, B. De Wever, Costerwêlverbinding, Costerwêl-Noord | 13 | 4 | 1 | 15 | 3 | 2016, 2017 | 1 |
| 85 | Design Contest | Intendant O'Hooghe, Capping, Masterplan, Toekomstverbond | 10 | 4 | 2 | 10 | 3 | 2016, 2017 | 1 |
| 87 | RWC | TV G&M, BAM, Groep C | 4 | 4 | 3 | 9 | 5 | 2008, 2007, 2015 | 1 |
| 88 | Rots | BAM, Groning, Costerwêlverbinding | 3 | 4 | 2 | 10 | 3 | 2013, 2014, 2015 | 1 |
| 89 | Stels-Morales | Masterplan, Stad A, ANV, De Lijn, BAM, TV G&M | 1 | 4 | 1 | 8 | 3 | 2007, 2008, 2012 | 1 |
| 100 | Sticbe | BAM, Kwaliteitskamer, Masterplan, Costerwêlverbinding | 4 | 4 | 2 | 8 | 3 | 2017, 2008, 2009 | 1 |
| 101 | TV G&M | BAM, Rots, Groning, Arcadis, Technum, Costerwêlverbinding, Masterplan, DeLijn, Groep C, Vlaams Bouwmeester, Kwaliteitskamer, planieren, Paper Nouveau, Vlaams Verkeerscentrum | 3 | 4 | 2 | 89 | 12 | 2002, 2005, 2008, 2007, 2008, 2009, 2011, 2012 | 1 |
| 102 | Arcadis | TV G&M, Rots | 3 | 4 | 3 | 2 | 2 | 2008, 2014 | 1 |
| 103 | Groning | TV G&M, Rots, Costerwêlverbinding, Stad A, DMOW, Portof A, NMBB, De Lijn | 3 | 4 | 3 | 2 | 2 | 2005, 2007 | 1 |
| 104 | Technum | TV G&M, Tritel, Groning, Stad A, DMOW, De Lijn, NMBB, Portof A, Costerwêlverbinding | 3 | 4 | 3 | 2 | 2 | 2005, 2007 | 1 |
| 105 | Vlaams Bouwmeester | BAM, Stad A, Langedwapper, Kwaliteitskamer, TV G&M, De Lijn, stadbouwmeester A, Norman, Staten-generaal | 1 | 4 | 3 | 11 | 5 | 2005, 2007, 2009 | 1 |
| 106 | WTCB | VTC, Costerwêlverbinding | 4 | 4 | 3 | 2 | 2 | 2016 | 1 |
| 107 | Capping | Costerwêlverbinding, Partial Cappings, Intendant, Ringland, stRaten-generaal, Toekomstverbond, Ademoos, Cooperation process Left Bank, Cooperation process Southernring, VlaReg_14 - Stad A, Portof A, planIER, projectIES, g&U, Stramen, Stedelijke ringweg, Rots, Design Contest, A. Tuntelboom, B. Tommelan, BAM | 10 | 2 | 1 | 58 | 5 | 2013, 2015, 2016, 2017 | 1 |
| 108 | Partial Cappings | Costerwêlverbinding, Intendant O'Hooghe, VlaReg_14 - Masterplan, Vlaams Verkeerscentrum, m&g&v ringen, ANV, VlaReg_29-34, VlaReg_34-35, VlaReg_32-14, VlaReg_14 - Liefdenoshok, costerwêlverbinding, B. Weys, De Lijn, stRaten-generaal, K. Kennis, B. De Wever, Stad Antwerpen, Ringland, Intendant O'Hooghe, Ademoos, Costerwêlverbinding, Costerwêl-Noord, VlaReg_14 | 10 | 3 | 2 | 8 | 3 | 2015, 2016 | 1 |
| 109 | Quick Wins | Costerwêlverbinding, B. Weys, De Lijn, stRaten-generaal, K. Kennis, B. De Wever, Stad Antwerpen, Ringland, Intendant O'Hooghe, Ademoos, Costerwêlverbinding, Costerwêl-Noord, VlaReg_14 | 8 | 3 | 2 | 33 | 7 | 2013, 2014, 2015, 2016, 2017 | 1 |
| 110 | Toekomstverbond | Intendant O'Hooghe, Ademoos, Costerwêlverbinding, Costerwêl-Noord, VlaReg_14 | 13 | 5 | 2 | 10 | 1 | 2017 | 1 |

11.3.2 Ringland

For this dissertation Ringland granted us an almost complete access to the daily activities, decision-making strategies, formal and informal meeting minutes. We even obtained email conversations and meeting minutes from the very start of Ringland in the end of 2012. During the period September 2015– April 2016, we followed Ringland very closely and attended several executive committee meetings and steering group meetings. We also planned several feedback meetings with Ringland to discuss the possible synergy between our research and the citizen movement. In addition we attended several public and expert events organised by Ringland (cf. Appendix 1, Section 10.3.3).

Coding the email conversations (clustered per month in one source document) in NVivo resulted in the identification of 461 actors. In order to optimise the visualisation of the actor network of the case, a selection of this total number was applied. The following selection criteria were used. Actors had to be coded in at least 10 separate coding references, or had to show up in at least two source documents. Where possible, we clustered actors in a logical entity they were part of (e.g. members of the parliamentary commission are clustered into one entity, and are not separately visible anymore). This means in practice that within one source, or thus, month, a certain actor should appear at least in ten different emails or paragraphs of meeting minutes. Or the actor should appear in at least two different source documents or months. This proves that the actor is considered relevant for the citizen movements; that they stay at least a few times on the Ringland agenda. Applying those selection criteria results in a number of 92 (f)actors that becomes included in the actor network visualisations. Table 15 gives an overview of the coded parliamentary committee minutes. An overview of the (f)actors, their connections and the other attributes is provided in Table 17.

11.4

Ucinet Node Attributes

As NVIVO only allows for numeric values, except for the label of the nodes in the network, all attributes were converted into numeric values. The legends of which are listed.

| BCP_num | BCP |
|---------|-----------|
| 1 | Business |
| 2 | Civic |
| 3 | Public |
| 4 | Knowledge |

| NRL_num | NRL |
|---------|-----------|
| 1 | Niche |
| 2 | Regime |
| 3 | Landscape |

| TTTE_num | TTTE |
|----------|---|
| 1 | Travel Market |
| 2 | Transport Market |
| 3 | Traffic Market |
| 4 | Environment |
| 5 | Travel Market + Transport Market |
| 6 | Transport Market + Traffic Market |
| 7 | Traffic Market + Environment |
| 8 | Travel Market + Environment |
| 9 | Transport Market+ Environment |
| 10 | Travel Market + Traffic Market |
| 11 | Transport Market + Traffic Market + Environment |
| 12 | Travel Market + Traffic Market + Environment |
| 13 | Travel Market + Transport market + Traffic Market |

Table 18 Overview of the node attributes used in NVivo and their meaning

Appendix 3. Initial route alternatives for the Oosterweel Link project

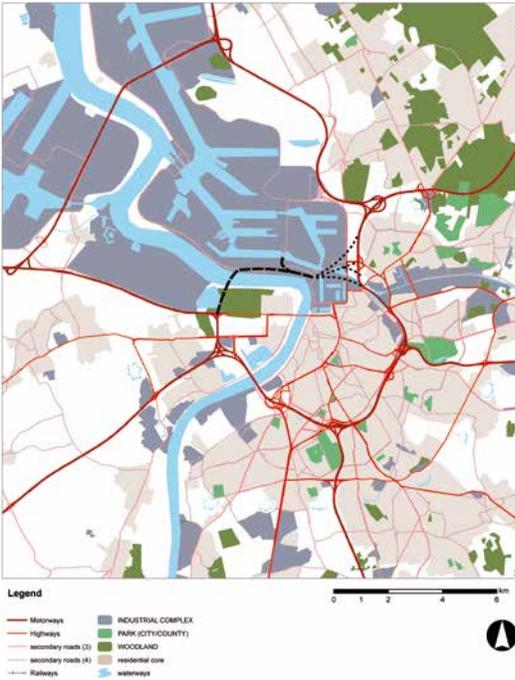


Figure 98 ABM Alternative variant 1, black large dots: viaduct, black small dots: tunnel. Source: based on AWW and Limehome fig. 2.1 p. 2.4 Overheidsstudie AWW Bestek/98C8, 1/03/2000 (<https://nl.wikipedia.org>).



Figure 99 ABM Alternative variant 2, black large dots: viaduct, black small dots. Source: based on AWW and Limehome fig. 2.2 p. 2.5 Overheidsstudie AWW Bestek/98C8, 1/03/2000 (<https://nl.wikipedia.org>).



Legend

- Motorways
- Highways
- secondary roads (3)
- secondary roads (4)
- Railways
- INDUSTRIAL COMPLEX
- PARK (CITY/COUNTY)
- WOODLAND
- residential core
- waterways

Figure 100 ABM Alternative variant 3, black large dots: viaduct, black small dots: tunnel. Source: based on AWV and Limehome fig. 2.3 p. 2.7 Overheidsstudie AWV Bestek/98C8, 1/03/2000 (<https://nl.wikipedia.org>).



Legend

- Motorway
- Highways
- secondary roads (3)
- secondary roads (4)
- Railways
- INDUSTRIAL COMPLEX
- PARK (CITY/COUNTY)
- WOODLAND
- residential core
- waterways

Figure 101 ABM Alternative variant 4. Source: based on AWV and Limehome fig. 2.4 p. 2.9 Overheidsstudie AWV Bestek/98C8, 1/03/2000 (<https://nl.wikipedia.org>).

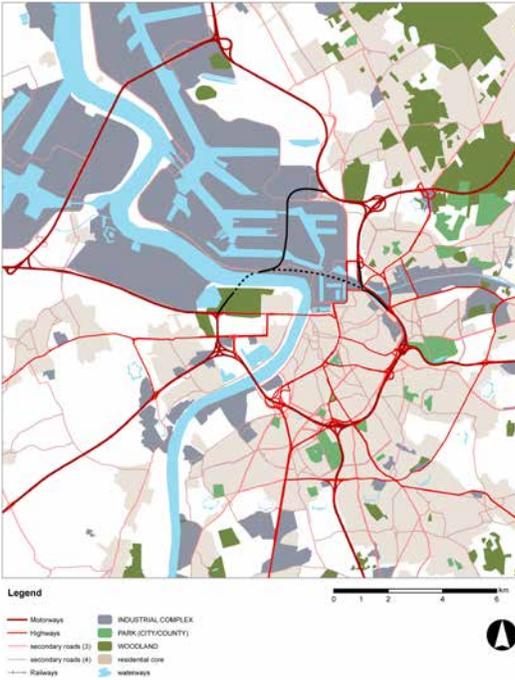


Figure 102 ABM Alternative variant 5.
 Source: based on AWW and Limehome
 fig. 2.5 p. 2.11 Overheidsstudie AWW
 Bestek/98C8, 1/03/2000
 (<https://nl.wikipedia.org>).



Figure 103 ABM Alternative variant 6.
 Source: based on AWW and Limehome
 fig. 2.6 p. 2.13 Overheidsstudie AWW
 Bestek/98C8, 1/03/2000
 (<https://nl.wikipedia.org>).



Figure 104 ABM Alternative variant 7.
 Source: based on AWW and Limehome
 fig. 2.7 p. 2.15 Overheidsstudie AWW
 Bestek/98C8, 1/03/2000
 (<https://nl.wikipedia.org>).

Appendix 4. CurieuzeNeuzen profile of participants and project outreach

Table 19 Age (n: 1,395)

| Age | % of participants |
|--------------|-------------------|
| 16-20 | 0.2 |
| 21-25 | 1.8 |
| 26-30 | 12.5 |
| 31-35 | 16.3 |
| 36-40 | 15.2 |
| 41-45 | 14.6 |
| 46-50 | 9.1 |
| 51-55 | 8.5 |
| 56-60 | 8.1 |
| 61-65 | 8.1 |
| 66-70 | 3.7 |
| more than 70 | 1.9 |

Table 20 Gender (n: 1,398)

| Gender | % of participants |
|--------|-------------------|
| Male | 46 |
| Female | 54 |

Table 21 Highest diploma (n: 1,410)

| Highest diploma | % of participants |
|-----------------------|-------------------|
| Primary education | 0.6 |
| Secondary education | 13.3 |
| Higher education | 80.6 |
| No diploma or unknown | 5.5 |

Table 22 Family situation (n: 732)

| Family situation | % of participants |
|--|-------------------|
| Single, without children | 15.3 |
| Single parent, with children | 9.2 |
| Living together or married, without children | 22.1 |
| Living together or married, with children | 50.5 |
| Other | 2.9 |

Table 23 How many other people did you talk with about the CurieuzeNeuzen research and or de results? (n: 663)

| People talked to | Total |
|--|--------|
| Friends | 3,489 |
| Family members | 2,706 |
| Neighbours | 4,200 |
| colleagues at work | 1,739 |
| During other social activities (sportclub, school, ..) | 1,648 |
| Total (for 660 participants) | 11,982 |
| Total (estimate: 1950 participants) | 35,400 |

References

- Ademloos. 2012. "Uit de ban van de Ring: de overkapping – presentatie van Peter Vermeulen." Ademloos, Last Modified 31/10/2012, accessed 11/08/2015, <http://www.ademloos.be/nieuws/uit-de-ban-van-de-ring-de-overkapping-presentatie-van-peter-vermeulen>.
- Agoria. 2017. "Guido Vaganée (burgemeester Bonheiden) over smart cities: 'Innovatie is de sleutel tot daadkracht'." Agoria, <https://www.agoria.be/nl/Guido-Vagane-e-burgemeester-Bonheiden-over-smart-cities-Innovatie-is-de-sleutel-tot-daadkracht>.
- Agyeman, Julian, and Briony Angus. 2003. "The role of civic environmentalism in the pursuit of sustainable communities." *Journal of Environmental Planning and Management* 46 (3):345-363.
- Akerman, Jonas, David Banister, Karl Dreborg, Peter Nijkamp, Ruggero Schleicher-Tappeser, Dominic Stead, and Peter Steen. 2000. *European transport policy and sustainable mobility*. London: Routledge.
- Albrechts, Louis. 2012. "Reframing strategic spatial planning by using a coproduction perspective." *Planning Theory* 12 (1):46-63.
- Albrechts, Louis, and Tom Coppens. 2003. "Megacorridors: striking a balance between the space of flows and the space of places." *Journal of Transport Geography* 11 (3):215-224.
- Albrechts, Louis, and Filip Meuris. 2000. *The EU compendium of spatial planning systems and policies: Belgium*. Luxembourg: European Commission.
- Alexander, Ernest R. 2002. "Acting together: from planning to institutional design." in Proceedings of XIV AESOP conference, Volos.
- Alford, John. 1998. "A public management road less travelled: Clients as co-producers of public services." *Australian Journal of Public Administration* 57 (4):128-137.
- Anable, Jillian, Christian Brand, Martino Tran, and Nick Eyre. 2012. "Modelling transport energy demand: A socio-technical approach." *Energy policy* 41:125-138.
- Anderson, Philip. 1999. "Perspective: Complexity theory and organization science." *Organization science* 10 (3):216-232.
- Arckus. 2007. *Sluipverkeer in de Zuidostrand van Antwerpen: Eindrapport versie 4.0a*: Vlaamse Overheid, Departement Mobiliteit en Openbare Werken, afdeling Beleid Mobiliteit en Verkeersveiligheid.
- aro. 2015, June 23 "Huidige Oosterweelverbinding is niet verenigbaar met Ringland." *De Standaard*. http://www.standaard.be/cnt/dmf20150623_01744410.
- Arts, B, and P Leroy. 2003. *Verandering van politiek, vernieuwing van milieubeleid. Klassieke en post-moderne arrangementen*. Nijmegen: Nijmegen University Press.
- asry. 2017, September 14 "Nog nooit inspraak op deze schaal geweest." *Gazet Van Antwerpen*, p 22.
- Axelrod, R., M.D. Cohen, and Babylonia. 2001. *Complexiteit in organisaties: een raamwerk voor het management*. Amsterdam: Financial Times/Prentice Hall.
- B.B.R. 2015, September 1 "De ingenieurs zijn klaar, het blijft wachten op de politici." *De Standaard*, p 11. Accessed 12 September 2015. http://www.standaard.be/cnt/dmf20150831_01842841.
- Banister, David. 2005. *Unsustainable transport: city transport in the new century*. Oxfordshire: Routledge.
- Banister, David. 2008. "The sustainable mobility paradigm." *Transport Policy* 15 (2):73-80.
- Belga. 2015a, June 28 "20.000 bezoekers voor tweede Ringlandfestival." *De Morgen*. <http://www.demorgen.be/binnenland/20-000-bezoekers-voor-tweede-ringlandfestival-a2378778/>.
- Belga. 2015b, July 2 "Actiegroepen voeren druk tegen 'beslist beleid' Oosterweel op." *De Standaard*. http://www.standaard.be/cnt/dmf20150702_01759838.
- Belgisch Staatsblad. 2014. *Ordonnantie houdende de algemene uitgavenbegroting van het Brussels Hoofdstedelijk Gewest voor het begrotingsjaar 2014*.
- Bertolini, Luca. 2012. "Integrating mobility and urban development agendas: A manifesto." *disP-The Planning Review* 48 (1):16-26.
- Bertolini, Luca, Frank le Clercq, and Thomas Straatemeier. 2008. "Urban transportation planning in transition." *Transport Policy* 15 (2):69-72.
- Beunen, Raoul, Kristof Van Assche, and Martijn Duineveld. 2015. *The Search for Evolutionary Approaches to Governance*. Heidelberg: Springer.
- Bevir, M. 2013. *A Theory of Governance*. Berkeley: University of California Press.

- Boelens, Luuk. 2010. "Theorizing practice and practising theory: Outlines for an actor-relational-approach in planning." *Planning theory* 9 (1):28-62.
- Boelens, Luuk. 2015. "Governance of mobile complexity: co-evolutionary management towards a resilient mobility in Flanders." In *Adaptive mobility: a new policy and research agenda on mobility in horizontal metropolises*, edited by Luuk Boelens, Dirk Lauwers and Frank Witlox, 191-209. Groningen: InPlanning.
- Boelens, Luuk, and Gert De Roo. 2014. Planning of undefined becoming; From poststructuralism towards actor-relational opportunities. *Planning Theory* 15 (1): 42-67.
- Bonney, Rick, Heidi Ballard, Rebecca Jordan, Ellen McCallie, Tina Phillips, Jennifer Shirk, and Candie C Wilderman. 2009. *Public Participation in Scientific Research: Defining the Field and Assessing Its Potential for Informal Science Education. A CAISE Inquiry Group Report*. Washington, D.C.: Center for Advancement of Informal Science Education (CAISE).
- Bonney, Rick, Caren B Cooper, Janis Dickinson, Steve Kelling, Tina Phillips, Kenneth V Rosenberg, and Jennifer Shirk. 2009. "Citizen science: a developing tool for expanding science knowledge and scientific literacy." *BioScience* 59 (11):977-984.
- Bonney, Rick, Jennifer L Shirk, Tina B Phillips, Andrea Wiggins, Heidi L Ballard, Abraham J Miller-Rushing, and Julia K Parrish. 2014. "Next steps for citizen science." *Science* 343 (6178):1436-1437.
- Boonstra, Beitske. 2015. "Planning Strategies in an Age of Active Citizenship. A Post-structuralist Agenda for Self-organization in Spatial Planning." Doctoral dissertation, Utrecht University.
- Boonstra, Beitske, and Luuk Boelens. 2011. "Self-organization in urban development: towards a new perspective on spatial planning." *Urban Research & Practice* 4 (2):99-122.
- Borgatti, Stephen P, Martin G Everett, and Jeffrey C Johnson. 2013. *Analyzing social networks*. London: SAGE Publications Ltd.
- Boussauw, Kobe, and Luuk Boelens. 2015. "Fuzzy tales for hard blueprints: the selective coproduction of the Spatial Policy Plan for Flanders, Belgium." *Environment and Planning C: Government and Policy* 33 (6):1376-1393.
- Boussauw, Kobe, and Thomas Vanoutrive. 2017. "Transport policy in Belgium: Translating sustainability discourses into unsustainable outcomes." *Transport Policy* 53:11-19.
- Bovaird, Tony. 2008. "Emergent strategic management and planning mechanisms in complex adaptive systems: the case of the UK Best Value initiative." *Public Management Review* 10 (3):319-340.
- Bovaird, Tony, and Elke Löffler. 2009. *Public management and governance*. 2nd ed. London: Routledge.
- Bradshaw, Ben. 2003. "Questioning the credibility and capacity of community-based resource management." *The Canadian Geographer/Le Géographe canadien* 47 (2):137-150.
- Brinckman, Bart. 2010, February 11 "Het woord is aan Kris Peeters." *De Standaard*. <http://www.standaard.be/cnt/722m4430?word=het+woord+is+aan+kris+peeters>.
- Brinckman, Bart. 2017, February 23 "Uitzicht op 'vredesverdrag' na twintig jaar oorlog " *De Standaard*. http://www.standaard.be/cnt/dmf20170223_02746552.
- Bringmann, Katja, Ann Verhetsel, Thomas Vanoutrive, and Jo Reynaerts. 2013. "The impact of venture capital linkages on start-ups' cluster embeddedness."
- Brossard, Dominique, Bruce Lewenstein, and Rick Bonney. 2005. "Scientific knowledge and attitude change: The impact of a citizen science project." *International Journal of Science Education* 27 (9):1099-1121.
- Brudney, Jeffrey L, and Robert E England. 1983. "Toward a definition of the coproduction concept." *Public Administration Review*:59-65.
- BSI. 2014. *BSI Standards Publication. Smart cities - Vocabulary PAS 180:2014*. London: The British Standards Institution.
- Buitelaar, Edwin, Wouter Jacobs, and Arnoud Lagendijk. 2007. "A theory of institutional change: illustrated by Dutchcity-provinces and Dutch land policy." *Environment and Planning A* 39 (4):891-908.
- Buitelaar, Edwin, Arnoud Lagendijk, and Wouter Jacobs. 2007. "A Theory of Institutional Change: Illustrated by Dutch City-Provinces and Dutch Land Policy." *Environment and Planning A: Economy and Space* 39 (4):891-908.
- Burch, Martin, Patricia Hogwood, SJ Bulmer, C Cairtriona, Ricardo Gomez, and Andrew Scott. 2003. "Charting routine and radical change: a discussion paper". *Manchester Papers in Politics: Devolution and European Policy Series, Paper, (6)*.

- Callon, Michel. 1986. "Some elements of a sociology of translation: domestication of the scallops and the fishermen of St. Brieuc Bay." *Power, action, and belief: A new sociology of knowledge* 32:196-223.
- Callon, Michel. 1999. "Actor-network theory – the market test." *The Sociological Review* 47 (S1):181-195.
- Callon, Michel, and John Law. 1997. "After the Individual in Society: Lessons on Collectivity from Science, Technology and Society." *The Canadian Journal of Sociology / Cahiers canadiens de sociologie* 22 (2):165-182.
- Carayannis, Elias G, and David FJ Campbell. 2009. "'Mode 3' and 'Quadruple Helix': toward a 21st century fractal innovation ecosystem." *International journal of technology management* 46 (3-4):201-234.
- Carslaw, David C. 2005. "Evidence of an increasing NO₂/NO_x emissions ratio from road traffic emissions." *Atmospheric Environment* 39 (26):4793-4802.
- Castenmiller, P, P Keur, and B Woudenberg. 2010. *Plusen en minnen. Evaluatie van de Wgr-plus*. Den Haag: Ministerie van Binnenlandse Zaken en Koninkrijksrelaties.
- Chapman, Lee. 2007. "Transport and climate change: a review." *Journal of transport geography* 15 (5):354-367.
- Cohen, Joshua, and Joel Rogers. 1992. "Secondary Associations and Democratic Governance." *Politics & Society* 20 (4):393-472.
- Cohen, Michael D, Rick L Riolo, and Robert Axelrod. 1999. *The emergence of social organization in the prisoner's dilemma: How context-preservation and other factors promote cooperation*. Santa Fe, New Mexico: Santa Fe Institute.
- Conrad, Catherine T, and Tyson Daoust. 2008. "Community-based monitoring frameworks: Increasing the effectiveness of environmental stewardship." *Environmental Management* 41 (3):358-366.
- Conrad, Cathy C., and Krista G. Hilchey. 2011. "A review of citizen science and community-based environmental monitoring: issues and opportunities." *Environmental Monitoring and Assessment* 176 (1):273-291.
- Cresswell, Tim. 2004. *Place: a Short Introduction*. Malden, MA: Blackwell.
- D'Hooghe, Alexander, Matthias Blondia, Sanne Peeters, Rolf van der Leeuw, Benoit Burquel, Michiel Duré, Hella Rogiers, Griet Noë, Daan Boddeke, Martin van Oosten, Stijn Joosten, Wiebe Mulder, and Mark de Bel. 2016. *Over de ring. Samen naar een aantrekkelijke metropool*. Antwerpen: Departement Mobiliteit en Openbare Werken.
- De Decker, Pascal. 2011. "Understanding housing sprawl: the case of Flanders, Belgium." *Environment and Planning A* 43 (7):1634-1654.
- De Meulder, Bruno, Jan Schreurs, Annabel Cock, and Bruno Notteboom. 1999. "Patching up the Belgian urban landscape." *Oase* 52:78-113.
- De Roo, Gert. 2012. "Spatial planning, complexity and a world 'out of equilibrium': outline of a non-linear approach to planning." In *Complexity and Spatial Planning: Systems, Assemblages and Simulations*, edited by G De Roo, J Jean Hillier and J Van Wezemaal, 129-165. Farnham UK: Ashgate.
- De Rynck, Filip. 2017, March 17 "Oosterweel: ook een plan voor nieuwe democratie?" *De Morgen*. <http://www.demorgen.be/opinie/oosterweel-ook-eeen-plan-voor-nieuwe-democratie-b3d05283/>.
- De Smet, Dries. 2014, 02/10/2014 "Nergens zoveel subsidies voor bedrijfsauto's als bij ons." *De Standaard*.
- De Verkeersonderneming. 2015. *Evaluatie Marktplaats voor Mobiliteit*. Rotterdam: De Verkeers-onderneming.
- Dendooven, Pascal. 2010, September 27 "Franse slag op Vlaamse bodem." *De Standaard*.
- Dickinson, Janis L, Jennifer Shirk, David Bonter, Rick Bonney, Rhiannon L Crain, Jason Martin, Tina Phillips, and Karen Purcell. 2012. "The current state of citizen science as a tool for ecological research and public engagement." *Frontiers in Ecology and the Environment* 10 (6):291-297.
- Dickinson, Janis L, Benjamin Zuckerberg, and David N Bonter. 2010. "Citizen science as an ecological research tool: challenges and benefits." *Annual review of ecology, evolution and systematics* 41:149-72.
- DiMaggio, Paul J. 1988. "Interest and agency in institutional theory." *Institutional patterns and organizations: Culture and environment* 1:3-22.

- Dobrov, Gennady M. 1979. "The strategy for organized technology in the light of hard-, soft-, and org-ware interaction." *Long Range Planning* 12 (4):79-90.
- Downs, Anthony. 1962. "The law of peak-hour expressway congestion." *Traffic Quarterly* 16 (3).
- Draulans, Dirk. 2016, September 21 "Waarom de 'lastigaards' zullen blijven komen." *Knack*, 96-99
- Dray, Lynnette M, Andreas Schäfer, and Moshe E Ben-Akiva. 2012. "Technology limits for reducing EU transport sector CO2 emissions." *Environmental science & technology* 46 (9):4734-4741.
- Duranton, Gilles, and Matthew A Turner. 2011. "The fundamental law of road congestion: Evidence from US cities." *American Economic Review* 101 (6):2616-52.
- E.D.M. 2015, December 25 "Ringland haalt beoogde 100.000 euro op voor studiewerk." *De Standaard*. http://www.standaard.be/cnt/dmf20141225_01446374.
- Egeter, B. , and O.A.W.T. van de Riet. 1998. *Systeemdiagram voor het beleidsveld vervoer en verkeer*. Delft: RAND Europe.
- El-adaway, Islam H, Ibrahim S Abotaleb, and Eric Vechan. 2016. Social Network Analysis Approach for Improved Transportation Planning. *Journal of Infrastructure Systems* 23 (2).
- European Commission Joint Expert Group on Transport and Environment. 2000. *Implementing Sustainable Urban Transport Policies*. Paris: ECMT/OECD.
- Evans, Celia, Eleanor Abrams, Robert Reitsma, Karin Roux, Laura Salmonsens, and Peter P Marra. 2005. "The Neighborhood Nestwatch Program: Participant outcomes of a citizen-science ecological research project." *Conservation Biology* 19 (3):589-594.
- Farthing, Stuart. 2016. *Research design in urban planning: a student's guide*. London: Sage Publications Ltd.
- Flyvbjerg, Bent. 2006. "Five misunderstandings about case-study research." *Qualitative inquiry* 12 (2):219-245.
- Flyvbjerg, Bent. 2007. "Policy and planning for large-infrastructure projects: problems, causes, cures." *Environment and Planning B: Planning and Design* 34 (4):578-597.
- Freitag, Amy, Ryan Meyer, and Liz Whiteman. 2016. "Strategies Employed by Citizen Science Programs to Increase the Credibility of Their Data." *Citizen Science: Theory and Practice*. 1 (1):1-11.
- Friedmann, John. 2010. "Place and place-making in cities: A global perspective." *Planning Theory & Practice* 11 (2):149-165.
- Fuchs, Stephan. 2001. *Against essentialism: A theory of culture and society*. London: Harvard University Press.
- Furubotn, Eirik Grundtvig, and Rudolf Richter. 1991. "The new institutional economics." In *The new institutional economics: A Collection of Articles from the Journal of Institutional and Theoretical Economics*, edited by Eirik Grundtvig Furubotn and Rudolf Richter, 1-34. Tübingen: J.C.B. Mohr.
- Geels, Frank. 2002a. "Technological transitions as evolutionary reconfiguration processes: a multi-level perspective and a case-study." *Research policy* 31 (8):1257-1274.
- Geels, Frank. 2002b. *Understanding the dynamics of technological transitions: a co-evolutionary and socio-technical analysis*. Enschede: Twente University Press.
- Geels, Frank. 2004. "From sectoral systems of innovation to socio-technical systems: Insights about dynamics and change from sociology and institutional theory." *Research policy* 33 (6):897-920.
- Geels, Frank. 2012. "A socio-technical analysis of low-carbon transitions: introducing the multi-level perspective into transport studies." *Journal of Transport Geography* 24 (0):471-482.
- Geels, Frank, and Johan Schot. 2007. "Typology of sociotechnical transition pathways." *Research policy* 36 (3):399-417.
- Geerlings, Harry. 2012. Nu verplaatsen in de tijd van morgen: uitdagingen voor duurzaamheid, mobiliteit en governance in een dynamische wereld. Rotterdam: Erasmus Universiteit Rotterdam.
- Geerlings, Harry, Yoram Shiftan, and Dominic Stead. 2012. "The Complex Challenge of Transitions Towards Sustainable Mobility – An Introduction." In *Transition towards sustainable mobility: the role of instruments, individuals and institutions*, edited by Harry Geerlings, Yoram Shiftan and Dominic Stead, 1-13. Farnham: Ashgate Publishing, Ltd.
- Gerometta, Julia, Hartmut Haussermann, and Giulia Longo. 2005. "Social innovation and civil society in urban governance: Strategies for an inclusive city." *Urban Studies* 42 (11):2007-2021.

- Giddens, Anthony. 1984. *The constitution of society: Outline of the theory of structuration*. Berkeley: University of California Press. Original edition, 1984.
- Gorham, Roger. 2009. *Demystifying induced travel demand: the Ministry*.
- Gössling, Stefan, and Scott Cohen. 2014. "Why sustainable transport policies will fail: EU climate policy in the light of transport taboos." *Journal of Transport Geography* 39 (0):197-207.
- Greener, Ian. 2002. "Theorising path-dependency: how does history come to matter in organisations?" *Management Decision* 40 (6):614-619.
- Hayek, Friedrich August. 1960. *The constitution of liberty: The definitive edition*. London: Routledge and Kegan Paul.
- Hertogh, Marcel, and Edward Westerveld. 2010. "Playing with Complexity. Management and organisation of large infrastructure projects." Doctoral Dissertation, Public Administration, Erasmus University Rotterdam.
- Hietanen, Sampo. 2014. "'Mobility as a Service' – the new transport model?" *Eurotransport* 12 (2).
- Hillier, Jean, Joris Van Wezemael, and Gert de Roo. 2012. *Complexity and planning: Systems, assemblages and simulations*. Farnham: Ashgate Publishing, Ltd.
- Hirst, Paul. 1994. *Associative Democracy: new forms of social and economic governance*. Cambridge: Polity Press.
- Hirst, Paul, and Veit-Michael Bader. 2001. *Associative democracy: the real third way*. London: Frank Cass.
- Hodgson, Geoffrey Martin. 1993. *Economics and evolution: bringing life back into economics*. Cambridge: Polity Press.
- Holland, John H. 1992. "Complex adaptive systems." *Daedalus*:17-30.
- Huang, Liang, Xinyan Zhu, Xinyue Ye, Wei Guo, and Jiye Wang. 2016. "Characterizing street hierarchies through network analysis and large-scale taxi traffic flow: a case study of Wuhan, China." *Environment and Planning B: Planning and Design* 43 (2):276-296.
- Hull, Angela. 2008. "Policy integration: What will it take to achieve more sustainable transport solutions in cities?" *Transport Policy* 15 (2):94-103.
- Huyse, Luc. 2015, May 13 "Wat Ringland en Weyts elkaar kunnen leren." *De Morgen*, p 24. <http://www.demorgen.be/opinie/wat-ringland-en-weyts-elkaar-kunnen-leren-b8d20827/>.
- Huyse, Luc. 2016, June 4 "Eindelijk, de bocht naar de burger." *De Standaard*.
- IGEMO. 2016. *Bereikbare Regio Regionaal Masterplan Duurzame Mobiliteit. Voortgangsrapportage fase 1 en 2, Plan van Aanpak fase 3 en 4*. Mechelen: IGEMO.
- Jacobs, Jane. 1961. *The death and life of great American cities*. New York: Random House and Jonathan Cape.
- Jan Van helden, G, and E Pieter Jansen. 2003. "New public management in Dutch local government." *Local Government Studies* 29 (2):68-88.
- Jeekel, Hans. 2017. "Social sustainability and smart mobility: exploring the relationship." *Transportation Research Procedia* 25:4300-4314.
- Jessop, Bob. 1997. "The governance of complexity and the complexity of governance: preliminary remarks on some problems and limits of economic guidance." In *Beyond markets and hierarchy: interactive governance and social complexity*, edited by A. Amin and J. Hausner, 111-147. Cheltenham: Edward Elgar.
- Jessop, Bob. 2001. "Institutional re (turns) and the strategic-relational approach." *Environment and Planning A* 33 (7):1213-1236.
- Jones, Candace, William S. Hesterly, and Stephen P. Borgatti. 1997. "A General Theory of Network Governance: Exchange Conditions and Social Mechanisms." *The Academy of Management Review* 22 (4):911-945.
- Jones, Rhys, Jessica Pykett, and Mark Whitehead. 2013. *Changing Behaviours - On the Rise of the Psychological State*. Cheltenham: Edward Elgar.
- Joss, Simon. 2016. "'SMART CITY': A Regressive Agenda?" Paper presented at Society for the History of Technology Annual Meeting 2016, Singapore, 22-26 June 2016.
- Kęptowski, Wojciech, and David Bassens. 2017. "'All transport problems are essentially mathematical": The uneven resonance of academic transport and mobility knowledge in Brussels." *Urban Geography*, 10.1080/02723638.2017.1336320:1-25. doi: 10.1080/02723638.2017.1336320.

- Kemp, René, and Derk Loorbach. 2006. "Transition management: a reflexive governance approach." In *Reflexive governance for sustainable development*, edited by Jan-Peter Voss, Dierk Bauknecht and René Kemp, 103-130. Montpellier: Edward Elgar Publishing.
- Kenis, PN, and KG Provan. 2008. "Het network-governance-perspectief." In *Business Performance Management. Sturen op prestatie en resultaat*, edited by T Wentink, 296-312. Den Haag: Boom Lemma uitgevers.
- Kingdon, J. W. 1995. *Agendas, alternatives, and public policies*. New York: HarperCollins.
- Klijn, Erik-Hans. 2008. "Governance and Governance Networks in Europe." *Public Management Review* 10 (4):505-525.
- L.B. 2010, April 29 "Stuurgroep start met uitwerking tunnel." *De Morgen*.
- Latour, Bruno. 2004. *Politics of nature : How to bring the sciences into democracy books*. Cambridge: Harvard University Press.
- Latour, Bruno. 2005. *Reassembling the social-an introduction to actor-network-theory*. Vol. 1, *Reassembling the Social-An Introduction to Actor-Network-Theory*, by Bruno Latour, pp. 316. Foreword by Bruno Latour. Oxford University Press, Sep 2005. ISBN-10: 0199256047. ISBN-13: 9780199256044. Oxford: Oxford University Press.
- Lauwers, Dirk, and Georges Allaert. 2013. "Sustainable urban mobility planning. Institutional cooperation, facts and theory." in Proceedings of Ch4llenge Workshop SUMP institutional cooperation, Leeds.
- Lauwers, Dirk, and Dominique Gillis. 2010. "Towards new principles of road categorization: reflections based on practices in Belgium and Eastern Europe." in Proceedings of First International Conference on Road and Rail Infrastructure.
- Law, John. 1986. "On the methods of long-distance control: vessels, navigation and the Portuguese route to India." *The Sociological Review* 32 (1):234-263.
- Lewné, Marie, Josef Cyrys, Kees Meliefste, Gerard Hoek, Michael Brauer, Paul Fischer, Ulrike Gehring, Joachim Heinrich, Bert Brunekreef, and Tom Bellander. 2004. "Spatial variation in nitrogen dioxide in three European areas." *Science of The Total Environment* 332 (1-3): 217-230.
- Linder, Stephen H, and B Guy Peters. 1995. "The two traditions of institutional designing: dialogue versus decision?" In *Institutional design*, edited by David L Weimer, 133-160. Norwell, Ma: Kluwer publishers.
- Litman, Todd. 2007. "Generated Traffic and Induced Travel: Implications for Transport Planning (Victoria, BC Victoria: Transport Planning Institute)."
- Litman, Todd. 2013. "The new transportation planning paradigm." *Institute of Transportation Engineers. ITE Journal* 83 (6):20.
- Litman, Todd, and Steven B Colman. 2001. "Generated traffic: Implications for transport planning." *Institute of Transportation Engineers. ITE Journal* 71 (4):38.
- Lowndes, Vivien, and Chris Skelcher. 1998. "The dynamics of multi-organizational partnerships: an analysis of changing modes of governance." *Public administration* 76 (2):313-333.
- Luhmann, Niklas. 1997. *Die Gesellschaft der Gesellschaft*. Frankfurt am Main: Suhrkamp.
- Macharis, Cathy, and Imre Keseru. 2018. "Rethinking mobility for a human city." *Transport Reviews* 38 (3):275-278.
- Marcussen, Martin, and Hans Peter Olsen. 2007. "Transcending Analytical Cliquishness with Second-generation Governance Network Analysis." In *Democratic Network Governance in Europe*, edited by Martin Marcussen and Jacob Torfing, 273-292. London: Palgrave Macmillan UK.
- Marín, Andrés, and Fikret Berkes. 2010. "Network approach for understanding small-scale fisheries governance: The case of the Chilean coastal co-management system." *Marine Policy* 34 (5):851-858.
- Marsden, Greg, Caroline Mullen, Ian Bache, Ian Bartle, and Matt Flinders. 2014. "Carbon reduction and travel behaviour: Discourses, disputes and contradictions in governance." *Transport Policy* 35 (0):71-78.
- Marshall, Stephen, and David Banister. 2000. "Travel reduction strategies: intentions and outcomes." *Transportation Research Part A: Policy and Practice* 34 (5):321-338.
- May, Anthony. 2015. "Encouraging good practice in the development of Sustainable Urban Mobility Plans." *Case studies on transport policy* 3 (1):3-11.

- Mayntz, Renate. 1998. "New challenges to governance theory." *Governance as social and political communication*:27-40.
- Mees, Hannelore, Barbara Tempels, Ann Crabbé, and Luuk Boelens. 2016. "Shifting public-private responsibilities in Flemish flood risk management. Towards a co-evolutionary approach." *Land Use Policy* 57:23-33.
- Metropoolregio Rotterdam Den Haag. 2014. *Conceptbegroting 2015 en Meerjarenbeeld 2016 -2018 Metropoolregio Rotterdam Den Haag*: Metropoolregio Rotterdam Den Haag.
- Ministerie van de Vlaamse gemeenschap. 2001. Decreet betreffende de organisatie van het personenvervoer over de weg en tot oprichting van de Mobiliteitsraad van Vlaanderen. edited by Ministerie van de Vlaamse gemeenschap. Brussel: Belgisch Staatsblad.
- Ministerie van Verkeer en Waterstaat. 2008. Samenwerkingsovereenkomst De Verkeersonderneming. edited by Ministerie van Verkeer en Waterstaat. Rotterdam: Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, Staatscourant.
- Moens, Barbara. 2014, October 22 "Oosterweel is af van een van de vele obstakels." *De Tijd*.
- Moens, Barbara, and Wim Van de Velden. 2017, February 8 "Oosterweelcompromis kost miljard extra." *De Tijd*.
- Moolenaar, Lex. 2008, July 11 "Stap naar referendum." *Gazet van Antwerpen*, p 7.
- Moolenaar, Lex. 2014, July 23 "Onzekerheid over Oosterweel." *Het Nieuwsblad*, p 22. http://www.nieuwsblad.be/cnt/dmf20140722_01188471.
- Moulaert, Frank, Flavia Martinelli, Erik Swyngedouw, and Sara Gonzalez. 2005. "Towards alternative model (s) of local innovation." *Urban studies* 42 (11):1969-1990.
- Muro, Melanie, and Paul Jeffrey. 2008. "A critical review of the theory and application of social learning in participatory natural resource management processes." *Journal of environmental planning and management* 51 (3):325-344.
- N.N. 2017, September 17 "Geen obstakels meer voor Oosterweel." *De Standaard*.
- Newman, Greg, Jim Graham, Alycia Crall, and Melinda Laituri. 2011. "The art and science of multi-scale citizen science support." *Ecological Informatics* 6 (3-4):217-227.
- North, Douglass C. 1990. *Institutions, institutional change and economic performance*: Cambridge university press.
- Nowotny, Helga, Peter B Scott, and Michael T Gibbons. 2001. *Re-thinking science: Knowledge and the public in an age of uncertainty*. Cambridge: Polity Press.
- Nykvist, Björn, and Lorraine Whitmarsh. 2008. "A multi-level analysis of sustainable mobility transitions: Niche development in the UK and Sweden." *Technological forecasting and social change* 75 (9):1373-1387.
- Olsen, Johan P, and James G March. 1989. *Rediscovering institutions: The organizational basis of politics*: New York: Free Press.
- Osborne, Stephen P. 2006. "The new public governance?" *Public Management Review* 8 (3):377-387.
- Osborne, Stephen P, and Kirsty Strokosch. 2013. "It takes two to tango? understanding the Co-production of public services by integrating the services management and public administration perspectives." *British Journal of Management* 24 (S1).
- Over de ring. 2017. "Verslag ringdagen. Gebundelde collectieve intelligentie." accessed December, 11, https://www.overdering.be/wp-content/uploads/2017/11/overdering_verslag_ringdagen.pdf.
- Oxford Dictionary 2014. <http://www.oxforddictionaries.com/definition/english/government>.
- Palm, Henri, and Marcel van der Meulen. 2014. "Rewarding for avoiding the peak period in Rotterdam." in Proceedings of Proceeding of 93rd Annual Meeting of The Transportation Research Board, Washington, D.C.
- Palmes, E. D., A. F. Gunnison, J. DiMattio, and C. Tomczyk. 1976. "Personal sampler for nitrogen dioxide." *American Industrial Hygiene Association Journal* 37 (10):570-577.
- Papa, Enrica, and Dirk Lauwers. 2015. "Smart mobility: opportunity or threat to innovate places and cities."
- Paredis, Erik, and Thomas Block. 2015. "Transitiepraktijk van de Vlaamse overheid: meer dan een schijnbeweging?" *VLAAMS TIJDSCHRIFT VOOR OVERHEIDSMANAGEMENT*, (1):11-19.
- Peeters, Tine, and Roel Wauters. 2017, March 16 "Na 21 jaar dan toch jawoord." *De Morgen*, p 6.

- Pel, Bonno, and Geert Teisman. 2009. "Governance of transitions as selective connectivity." in Proceedings of IRSPM conference April.
- Peleman, David. 2010. "The production of public space and the re-invention of history: the case of the road network and the Belgian city (1945-1962)." in Proceedings of Public Life in the In-Between-City (PLiC-2010).
- Penris, Jan, and Jan Peumans. 2007. *Beheersmaatschappij Antwerpen Mobiel (BAM) – Grote Infrastructuurprojecten – Zesde Voortgangsrapportage maart 2007. Verslag namens de Commissie voor Openbare Werken, Mobiliteit en Energie*. Brussel: Vlaams Parlement.
- Peumans, Jan, and Jan Penris. 2005. *Beheersmaatschappij Antwerpen Mobiel (BAM) – Grote Infrastructuurprojecten – Eerste voortgangsrapportage juni 2005. Verslag namens de Commissie voor Openbare Werken, Mobiliteit en Energie*. Brussel: Vlaams Parlement.
- Pierre, Jon. 2000. *Debating governance: Authority, steering, and democracy*: Oxford University Press.
- PJBA. 2016, October 24 "Rode bollen tegen slechte luchtkwaliteit." *Het Laatste Nieuws*. <http://www.hln.be/regio/nieuws-uit-borgerhout/rode-bollen-tegen-slechte-luchtkwaliteit-a2935786/>.
- Pollitt, Christopher. 2008. *Time, policy, management: governing with the past*. Oxford: Oxford University Press.
- Portugali, Juval. 2006. "Complexity theory as a link between space and place." *Environment and Planning A* 38 (4):647-664.
- Portugali, Juval. 2012. "Complexity theories of cities: Achievements, criticism and potentials." In *Complexity theories of cities have come of age*, 47-62. Heidelberg: Springer.
- Priemus, Hugo. 2007. "Development and design of large infrastructure projects: disregarded alternatives and issues of spatial planning." *Environment and Planning B: Planning and Design* 34 (4):626-644.
- Pryke, Stephen D. 2005. "Towards a social network theory of project governance." *Construction management and economics* 23 (9):927-939.
- Putnam, Robert D. 1995. "Bowling alone: America's declining social capital." *Journal of democracy* 6 (1):65-78.
- Raddick, M Jordan, Georgia Bracey, Pamela L Gay, Chris J Lintott, Phil Murray, Kevin Schawinski, Alexander S Szalay, and Jan Vandenberg. 2010. Galaxy zoo: Exploring the motivations of citizen science volunteers. *Astronomy Education Review* 9 (1). doi:10.3847/AER2009036.
- Rajan, Sudhir Chella. 2006. "Climate change dilemma: technology, social change or both?: An examination of long-term transport policy choices in the United States." *Energy policy* 34 (6):664-679.
- Rhodes, Roderick Arthur William. 1996. "The new governance: governing without government1." *Political studies* 44 (4):652-667.
- Richard, Nobles, and Schiff David. 2006. *A sociology of jurisprudence*. Oxford: Hart.
- Ringland. 2014. "MEMORANDUM voor de volgende VLAAMSE REGERING." Ringland, Last Modified 15/05/2014, <http://www.ringland.be/memorandum/>.
- Rip, Arie. 2002. "Postmodern Science and Technology Policy." Paper presented at NISTEP International Symposium 2002, Tokyo, February 28 - March 1.
- Rip, Arie. 2006. "A Co-Evolutionary Approach to Reflexive Governance—and its Ironies." In *Reflexive governance for sustainable development*, edited by JP Voss, D Bauknecht and R Kemp, 82-100. Cheltenham, UK/Northampton, MA, USA: Edward Elgar.
- Rittel, Horst WJ. 1972. *On the Planning Crisis: Systems Analysis of the "First and Second Generations"*: Institute of Urban and Regional Development.
- Rittel, Horst WJ, and Melvin M Webber. 1973. "Dilemmas in a general theory of planning." *Policy sciences* 4 (2):155-169.
- Rotmans, Jan, and Derk Loorbach. 2010. "Towards a better understanding of transitions and their governance. A systemic and reflexive approach." In *Transitions to sustainable development. New directions in the study of long term transformative change*, edited by John Grin, Jan Rotmans, Johan Schot, Frank Geels and Derk Loorbach, 105-198. New York: Routledge.
- Rupprecht Consult. 2012. *The State-of-the-Art of Sustainable Urban Mobility Plans*. Cologne: ELTISplus.
- Ryckewaert, Michael. 2012. "Building a Hybrid Highway System: Road Infrastructure as an Instrument of Economic Urbanization in Belgium." *Transfers* 2 (1):59-86.

- Salet, Willem, Luca Bertolini, and Mendel Giezen. 2013. "Complexity and uncertainty: problem or asset in decision making of mega infrastructure projects?" *International Journal of Urban and Regional Research* 37 (6):1984-2000.
- Scharpf, Fritz Wilhelm. 1997. *Games real actors play: Actor-centered institutionalism in policy research*. Vol. 1997: Westview Press Boulder, CO.
- Schwanen, Tim. 2016. "Geographies of transport I: Reinventing a field?" *Progress in Human Geography* 40 (1):126-137.
- Schwanen, Tim. 2017. "Geographies of transport II: Reconciling the general and the particular." *Progress in Human Geography* 41 (3):355-364.
- Schwanen, Tim, David Banister, and Jillian Anable. 2012. "Rethinking habits and their role in behaviour change: the case of low-carbon mobility." *Journal of Transport Geography* 24:522-532.
- Service Public de Wallonie. 2014. *Budget des recettes de la Région Wallonne pour l'année budgétaire 2014*.
- Seyfang, Gill, and Alex Haxeltine. 2012. "Growing grassroots innovations: exploring the role of community-based initiatives in governing sustainable energy transitions." *Environment and Planning C: Government and Policy* 30 (3):381-400.
- Shove, Elizabeth, and Gordon Walker. 2010. "Governing transitions in the sustainability of everyday life." *Research policy* 39 (4):471-476.
- Silvertown, Jonathan. 2009. "A new dawn for citizen science." *Trends in Ecology & Evolution* 24 (9):467-471.
- Simon, Herbert A. 1972. "Theories of bounded rationality." In *Decision and organization*, edited by C B McGuire and R Radner, 161-176. Amsterdam: North-Holland Publishing Company.
- Solvit, Samuel. 2012. *Dimensions of War: Understanding War as a Complex Adaptive System: l'Harmattan*.
- Stacey, Ralph D. 1996. "One Point of View: Management and the Science of Complexity: If Organizational Life Is Nonlinear, Can Business Strategies Prevail?" *Research-technology management* 39 (3):8-10.
- Stacey, Ralph D. 2001. *Complex responsive processes in organizations: Learning and knowledge creation*: Psychology Press.
- Stacey, Ralph D. 2007. *Strategic management and organisational dynamics: The challenge of complexity to ways of thinking about organisations*. 5 ed: Pearson education.
- Stoker, G., and K. Mossberger. 1994. "Urban Regime Theory in Comparative Perspective." *Environment and Planning C: Government and Policy* 12 (2):195-212.
- Stoker, Gerry. 1998. "Governance as theory: five propositions." *International social science journal* 50 (155):17-28.
- Stone, Clarence N. 1993. "Urban Regimes and the Capacity to Govern: A Political Economy Approach." *Journal of Urban Affairs* 15 (1):1-28.
- Storksdieck, Martin, Jennifer Lynn Schirk, Jessica L. Cappadonna, Meg Domroese, Claudia Göbel, Muki Haklay, Abraham J. Miler-Rushing, Philip Roetman, Carla Sbrocchi, and Katrin Vohland. 2016. "Associations for Citizen Science: Regional Knowledge, Global Collaboration." *Citizen Science: Theory and Practice* 1 (2):1-10.
- Sullivan, Brian L, Christopher L Wood, Marshall J Iliff, Rick E Bonney, Daniel Fink, and Steve Kelling. 2009. "eBird: A citizen-based bird observation network in the biological sciences." *Biological Conservation* 142 (10):2282-2292.
- Switzer, Andrew, Luca Bertolini, and John Grin. 2013. "Transitions of Mobility Systems in Urban Regions: A Heuristic Framework." *Journal of Environmental Policy & Planning* 15 (2):141-160.
- Teisman, Geert. 2005. *Publiek management op de grens van orde en chaos. Over leidinggeven en organiseren in complexiteit*. Den Haag: Sdu.
- Teisman, Geert. 2008. "Complexity and management of improvement programmes: An evolutionary approach." *Public Management Review* 10 (3):341-359.
- Teisman, Geert, Arwin van Buuren, and Lasse M Gerrits. 2009. *Managing complex governance systems*. New York: Routledge.
- Tempels, Barbara. 2016. "Flood resilience : a co-evolutionary approach. residents, spatial developments and flood risk management in the Dender basin." Ghent University.
- Terryn, Els. 2016. "De situationele benadering: een onderzoek naar de betekenis en mogelijkheden van beleidsevaluatie in de ruimtelijke planning." Ghent University.

- Theunis, Jan, Jan Peters, and Bart Elen. 2017. "Participatory Air Quality Monitoring in Urban Environments: Reconciling Technological Challenges and Participation." In *Participatory Sensing, Opinions and Collective Awareness*, edited by Vittorio Loreto, Muki Haklay, Andreas Hotho, Vito D. P. Servedio, Gerd Stumme, Jan Theunis and Francesca Tria, 255-271. Cham: Springer International Publishing.
- Tregidgo, Daniel J., Sarah E. West, and Mike R. Ashmore. 2013. "Can citizen science produce good science? Testing the OPAL Air Survey methodology, using lichens as indicators of nitrogenous pollution." *Environmental Pollution* 182:448-451.
- Truyts, Philippe. 2017, June 14 "Erop of eronder voor Toekomstverbond." *Het Laatste Nieuws*.
- Tweede Kamer der Staten-Generaal. 2011. *Voortgangsbericht visienota bestuur en bestuurlijke inrichting*. Den Haag: Tweede Kamer der Staten-Generaal.
- Tweede Kamer der Staten-Generaal. 2012. *Voortgangsbericht visienota bestuur en bestuurlijke inrichting*. Den Haag: Tweede Kamer der Staten-Generaal.
- Urry, John. 2004. "The 'system' of automobility." *Theory, Culture & Society* 21 (4-5):25-39.
- Van Acker, Veronique. 2015. "Car use as a life style? Integrating lifestyles into travel behaviour." In *Adaptive Mobility. A new policy and research agenda on mobility in horizontal metropolises*, edited by Luuk Boelens, Dirk Lauwers and Frank Witlox, 45-66. Groningen: InPlanning.
- Van Acker, Veronique, Phil Goodwin, and Frank Witlox. 2016. "Key research themes on travel behavior, lifestyle, and sustainable urban mobility." *International journal of sustainable transportation* 10 (1):25-32.
- Van Acker, Veronique, Patricia L Mokhtarian, and Frank Witlox. 2014. "Car availability explained by the structural relationships between lifestyles, residential location, and underlying residential and travel attitudes." *Transport Policy* 35:88-99.
- Van Assche, Kristof, Raoul Beunen, and Martijn Duineveld. 2013. *Evolutionary governance theory: an introduction*: Springer.
- Van Assche, Kristof, Raoul Beunen, Joren Jacobs, and Petruta Teampau. 2011. "Crossing trails in the marshes: rigidity and flexibility in the governance of the Danube Delta." *Journal of environmental planning and management* 54 (8):997-1018.
- Van Assche, Kristof, and Nodir Djanibekov. 2012. "Spatial planning as policy integration: The need for an evolutionary perspective. Lessons from Uzbekistan." *Land use policy* 29 (1):179-186.
- Van Assche, Kristof, and Gert Verschraegen. 2008. "The limits of planning: Niklas Luhmann's systems theory and the analysis of planning and planning ambitions." *Planning theory* 7 (3):263-283.
- Van Brussel, Suzanne, Luuk Boelens, and Dirk Lauwers. 2016. "Unravelling the Flemish Mobility Orgware: the transition towards a sustainable mobility from an actor-network perspective." *European Planning Studies* 24 (7):1336-1356.
- Van Brussel, Suzanne, and Huib Huyse. 2018. "Citizen science on speed? Realising the triple objective of scientific rigour, policy influence and deep citizen engagement in a large-scale citizen science project on ambient air quality in Antwerp." *Journal of Environmental Planning and Management*, 10.1080/09640568.2018.1428183:1-18. doi: 10.1080/09640568.2018.1428183.
- Van Brusselen, Daan, Wouter Arrazola de Oñate, Bino Maiheu, Stijn Vranckx, Wouter Lefebvre, Stijn Janssen, Tim S. Nawrot, Ben Nemery, and Dirk Avonts. 2016. "Health Impact Assessment of a Predicted Air Quality Change by Moving Traffic from an Urban Ring Road into a Tunnel. The Case of Antwerp, Belgium." *PLOS ONE* 11 (5):e0154052. doi: 10.1371/journal.pone.0154052.
- Van Ginneken, Sylvie. 2016, June 6 "Grote verzoener haalt lont uit Oosterweel-kruitvat." *De Standaard*, p 6.
- van Lier, Tom, and Cathy Macharis. 2015. "Transport: Addicted to Oil." In *Decarbonization in the European Union: Internal Policies and External Strategies*, edited by Claire Dupont and Sebastian Oberthür, 115-136. London: Palgrave Macmillan UK.
- Vandaele, John, and Filip De Rynck. 2016, October 25 "Politici, zet ramen en deuren open voor je burgers!" *MO*, <https://www.mo.be/interview/politici-zet-ramen-en-deuren-open-voor-je-burgers>.
- Vandenbergh, Jochen. 2009, October 19 "'Naar een nieuw Antwerpen zonder BAM'." *De Standaard*.
- Vanveldhoven, Sandra, and Dirk Lauwers. 2010. "Hoe het Oosterweelproject volledig vastliep." *VERKEERSSPECIALIST*, (171):18-21.
- Vanveldhoven, Sandra, Dirk Lauwers, and Marleen Goethals. 2009. "Het leerproces van Oosterweel." *RUIMTE*, (3):67-68.

- Verbeek, Thomas. 2017. "Living Cities: Reconnecting Environmental Health and Urban Planning." Ghent University.
- Verbeek, Thomas, and Luuk Boelens. 2016. "Environmental health in the complex city: a co-evolutionary approach." *Journal of Environmental Planning and Management* 59 (11):1913-1932.
- Vercruyssen, Geert, Floris Van den Broeck, Fred Van Remoortel, Tim Vanduren, and Wim Hendrickx. 2012. *Mobiliteitsstudie Noorderkempen - Eindrapport: Dienst Mobiliteit Provincie Antwerpen*.
- Verelst, Jeroen. 2008, May 31 "Lange Wapper is een middeleeuws project." *De Morgen*.
- Verelst, Jeroen. 2011, June 10 "Studie naar Meccanoplan bestaat niet." *De Morgen*.
- Verhoeven, Karel, and Tom Ysebaert. 2008, June 14 "Het mysterie van A." *De Standaard*.
- Verstraete, Katrien. 2010, September 23 "Oosterweelende nog lang niet voorbij! Bouwaanvraag en milieuraapporten moeten opnieuw worden ingediend! Banken vinden voor financiering wordt heikele zaak." *De Tijd*.
- Vlaams Parlement. 2008. *Vraag om uitleg over de opvolging van de SLUIZO-studie en het gebruik van de studie als pilootproject voor Vlaanderen*: Vlaams Parlement.
- Vlaams Parlement. 2010. *Vraag om uitleg van mevrouw Sophie De Wit tot mevrouw Hilde Crevits, Vlaams minister van Mobiliteit en Openbare Werken, over de werking van het Overlegplatform Mobiliteit ZuidOstrand Antwerpen (MOZO)*. Brussel: Commissie voor Openbare Werken, Mobiliteit en Energie.
- Vlaams Parlement. 2013. *Ontwerp van decreethoudende de algemene uitgavenbegroting van de Vlaamse Gemeenschap voor het begrotingsjaar 2014*.
- Vlaams Parlement. 2017a. *Verslag van de Vlaamse Regering over de uitvoering van het Toekomstverbond voor bereikbaarheid en leefbaarheid*. Brussel: Vlaams Parlement.
- Vlaams Parlement. 2017b. *Vraag om uitleg over de reorganisatie van De Lijn van Karin Brouwers aan minister Ben Weyts*. Brussel: Vlaams Parlement.
- Vlaamse Overheid. 2009. Decreet betreffende het mobiliteitsbeleid. edited by Departement Mobiliteit en Openbare Werken. Brussel: Belgisch Staatsblad.
- Voss, Jan-Peter, and René Kemp. 2006. "Sustainability and reflexive governance: introduction." In *Reflexive governance for sustainable development*, edited by Jan-Peter Voss, Dierk Bauknecht and René Kemp, 3-28. Montpellier: Edward Elgar Publishing.
- W.A.M. 2010, January 15, 2010 "MOZO wordt nieuw leven in geblazen." *Het Nieuwsblad/Antwerpen*.
- Wakefield, Sarah E. L., Susan J. Elliott, Donald C. Cole, and John D. Eyles. 2001. "Environmental risk and (re)action: air quality, health, and civic involvement in an urban industrial neighbourhood." *Health & Place* 7 (3):163-177.
- Webster, Christopher J., and Lawrence Wai-Chung Lai. 2003. *Property rights, planning and markets: Managing spontaneous cities*. Cheltenham, UK: Edward Elgar Publishing.
- Wefering, F., S. Rupprecht, S. Bührmann, and S. Böhrer-Baedeker. 2013. *Guidelines. Developing and Implementing a Sustainable Urban Mobility Plan*. Brussels: European Commission.
- Weimer, David L. 1995. "Institutional design: overview." In *Institutional design*, 1-16. Springer.
- Weyts, Ben. 2016. *Conceptnota. Met basisbereikbaarheid naar een efficiënt en aantrekkelijk vervoersmodel in Vlaanderen dat optimaal tegemoetkomt aan de globale en lokale vervoersvraag*. Brussel: Vlaams Parlement.
- Weyts, Ben. 2017. *Conceptnota aan de Vlaamse Regering, betreft: stand van zaken inzake Basisbereikbaarheid*. Brussel: Vlaamse Regering.
- Whitelaw, Graham, Hague Vaughan, Brian Craig, and David Atkinson. 2003. "Establishing the Canadian community monitoring network." *Environmental monitoring and assessment* 88 (1-3):409-418.
- Williams, Katie. 2005. *Spatial planning, urban form and sustainable transport*. Edited by Katie Williams. Aldershot: Ashgate.
- Wilsford, David. 1994. "Path Dependency, or Why History Makes It Difficult but Not Impossible to Reform Health Care Systems in a Big Way." *Journal of Public Policy* 14 (3):251-283.
- Yin, Robert K. 2014. *Case study research: Design and methods*. 5th ed. Thousand Oaks, CA: Sage publications.
- Young, Oran R. 2017. *Governing Complex Systems: Social Capital for the Anthropocene*. London: MIT Press.

Internet sources

http://4.bp.blogspot.com/_9fJALToVDT4/SF5Y10YUI2I/AAAAAAAAExU/fA9AjpEhWgk/s400/lw14.jpg (10/02/2017).

<http://dederactie.be/cm/vrtnnieuws/regio/vlaamsbrabant/2.34088> (22/01/2018).

<http://regionetleuvenbe.webhosting.be/extra/> (20/10/2017).

<http://vervoersplanoloog.blogspot.com/2011/> (25/01/2018).

<http://www.ademloos.be/nieuws/milieu/bam-wil-ringland> (3/10/2016).

<http://www.bavo.biz/img/images/langewapper%2012.jpg> (10/02/2017).

<http://www.businessdictionary.com/definition/corporate-governance.html> (11/09/2016).

<http://www.mobielvlaanderen.be/overheden/artikel.php?id=1968> (2/02/2017).

http://www.nieuwsblad.be/cnt/dmf04032009_049 (10/02/2017).

<http://www.verkeerscentrum.be/verkeersinfo/nieuwsitems/2010/nieuws-100225-MOZO> (10/10/2017).

<https://en.oxforddictionaries.com/definition/leprechaun> (30/01/2018).

<https://en.oxforddictionaries.com/definition/mobility> (20/01/2018).

<https://en.oxforddictionaries.com/definition/transport> (20/01/2018).

<https://nl.wikipedia.org/wiki/Oosterweelverbinding#/media/File:SluitenR1variante1.jpg> (18/01/2018).

<https://nl.wikipedia.org/wiki/Oosterweelverbinding#/media/File:SluitenR1variante4.jpg> (18/01/2018).

<https://nl.wikipedia.org/wiki/Oosterweelverbinding#/media/File:SluitenR1variante5.jpg> (18/01/2018).

<https://nl.wikipedia.org/wiki/Oosterweelverbinding#/media/File:SluitenR1variante6.jpg> (18/01/2018).

<https://nl.wikipedia.org/wiki/Oosterweelverbinding#/media/File:SluitenR1variante7.jpg> (18/01/2018).

<https://nl.wikipedia.org/wiki/Oosterweelverbinding#/media/File:Trac%C3%A9abm2.jpg> (18/01/2018).

<https://nl.wikipedia.org/wiki/Oosterweelverbinding#/media/File:Trac%C3%A9abm3.jpg> (18/01/2018).

https://rsv.ruimtevlaanderen.be/Portals/121/documents/workshops/2011/00_3_LUC_GOEDERTIER_Investeringsprojecten.pdf (5/04/2016).

<https://www.cob.nl/magazines-brochures-en-nieuws/nieuws/nieuws/tweede-kamer-blanken-burgtunnel-maar-wel-aangepast.html> (25/01/2018).

https://www.slideshare.net/Institut_national_du_cancer/21-ross-c-brownson (20/03/2016).

<https://www.slimnaarantwerpen.be/nl/mobiliteitsaanbieders/projectoproep-2016#ed3cc950-8368-4968-9d5f-9456ec96bde3> (22/10/2017).

© Suzanne Van Brussel, Department of Civil Engineering, Faculty of Engineering and Architecture, Ghent University 2018.

ISBN

978-94-6355-131-1

Cover

©Suzanne van Brussel

Internal design and production

André Diepgrond / In Ontwerp, Assen

Digital access

InPlanning Technical Team

InPlanning Editor in Chief

Gert de Roo

This work is intellectual property and subject to copyright. All rights reserved, whether the whole or part of the material is concerned. Duplication of this publication or parts thereof is permitted only under the provisions of the 'Auteurswet' (Copyright Law) of the 23th of September 1912, in its current version, and permission for use must always be obtained from InPlanning. Violations are liable to prosecution under Dutch Law.

PhD Series InPlanning

// IN /
PLAN /
/ NING

Published by InPlanning

Oude Kijk in 't Jatstraat 6,
9712 EG Groningen, The Netherlands

info@inplanning.eu

www.inplanning.eu

InPlanning is legally registered as cooperative under KvK 58997121

The InPlanning PhD Series supports the publication and distribution of PhD theses produced within Schools of Planning. The InPlanning PhD Series is part of the InPlanning portfolio of books, journals, posters, videos, documentaries and other information carriers. The InPlanning PhD Series is available on the InPlanning App for tablets (iOS and Android) and via www.inplanning.eu.

The Art of Governing in the Complex Mobility Transition

Mobility problems increasingly become complex, and in order to respond to them, the decision-making processes and proposed solutions must also become more complex; they should by no means ignore this complexity by creating standard solutions. Solutions are often strongly viewed and formulated from the infrastructural-technical (hardware) and technological and user-oriented (software) angle, while an appropriate organization or “orgware” to be able to cope with such complexity is lacking. Yet, mobility is much more than just the construction of infrastructure or the development of new vehicle technology; it is influenced by so many other policy areas and evolutions, and by individual and collective customs. Each of us can be held responsible in the mobility transition. There is general acceptance that, in order to initiate a mobility transition, our behaviour – the way we act and govern – must also change.

In this dissertation we reveal a necessary orgware agenda, based on real-world complex case studies that provide insight into some recent, important orgware innovations in mobility: developing a regional cooperation for mobility, the transport regions, and dealing with complexity in large infrastructure projects. By visualising the mobility orgware, we try to materialise the use and the added value of the orgware approach. We focus on mapping the actors and the institutional context and we analyse how these two influence each other. In order to play with complexity and progress towards a more sustainable mobility, we propose an orgware agenda that aims to structurally connect a variety of actors across the various related policy areas. Therefore, the necessary conditions or institutional changes should be introduced as well, so that there are no obstacles to the new partnerships. This research is a plea for a co-evolutionary orgware approach to mobility to complement the conventional hardware and software approaches.



Suzanne Van Brussel (1991) holds a Master’s degree in Urbanism and Spatial Planning (Ghent University, 2014). From 2014 to 2018, she worked as a PhD researcher at the Centre for Mobility and Spatial Planning at Ghent University. Her research interests span the fields of spatial planning and mobility, and include urban governance, sustainable mobility, and citizen science in particular.

// IN /
PLAN /
/ NING

WWW.INPLANNING.EU