

Contents

ABSTRACT.....	x
KURZFASSUNG	xii
LIST OF PUBLICATIONS	xiv
ACKNOWLEDGEMENTS	xviii
1 INTRODUCTION.....	1
1.1 BACKGROUND AND MOTIVATION	1
1.2 STRUCTURE OF THE THESIS.....	3
2 PERFORMANCE IMPROVEMENTS FOR LARGE-SCALE TRAFFIC SIMULATION IN MATSIM.....	5
2.1 INTRODUCTION	6
2.2 RELATED WORK	7
2.3 IMPLEMENTATION.....	12
2.4 EXPERIMENTS AND RESULTS.....	18
2.5 DISCUSSION AND FUTURE WORK.....	26
2.6 CONCLUSIONS.....	29
3 PLUG-IN HYBRID ELECTRIC VEHICLES AND SMART GRID: INVESTIGATIONS BASED ON A MICRO- SIMULATION	31
3.1 INTRODUCTION	32
3.2 RELATED WORK AND BACKGROUND INFORMATION	34
3.3 METHODOLOGY AND SIMULATIONS	38
3.4 DISCUSSION AND FUTURE WORK.....	53
3.5 CONCLUSIONS.....	55
4 AN AGENT-BASED PARKING CHOICE MODEL.....	57
4.1 INTRODUCTION AND BACKGROUND	58
4.2 THE PARKING CHOICE MODEL.....	59
4.3 IMPLEMENTATION.....	62
4.4 SIMULATIONS.....	66
4.5 DISCUSSION AND FUTURE WORK.....	72
4.6 CONCLUSIONS.....	73
5 OPTIMIZING PARKING PRICES USING AN AGENT-BASED APPROACH.....	75

5.1	INTRODUCTION	76
5.2	THE PARKING MODEL	77
5.3	SIMULATIONS AND RESULTS	80
5.4	DISCUSSION AND FUTURE WORK	92
5.5	CONCLUSIONS	95
6	ADDING ELECTRIC VEHICLE MODELING CAPABILITY TO AN AGENT-BASED TRANSPORT SIMULATION	97
6.1	INTRODUCTION	98
6.2	BACKGROUND.....	100
6.3	THE TRANSPORTATION ENERGY SIMULATION FRAMEWORK	104
6.4	CASE STUDY: CITY OF ZURICH.....	113
6.5	DISCUSSION	135
6.6	FUTURE WORK.....	139
6.7	CONCLUSIONS	140
7	CONCLUSIONS AND FUTURE WORK	143
7.1	RESULTS AND CONCLUSIONS	143
7.2	FUTURE WORK.....	144
8	BIBLIOGRAPHY	149