

# Urban consolidation platforms as a means of decreasing costs and enhancing performance of urban logistics chains within the framework of a market economy - Application to Brussels Capital

by Milena Janjevic



ULB



ECOLE  
POLYTECHNIQUE  
DE BRUXELLES

ULB

UNIVERSITÉ LIBRE DE BRUXELLES, UNIVERSITÉ D'EUROPE

**URBAN FREIGHT CONSOLIDATION PLATFORMS AS A  
MEANS OF DECREASING COSTS AND ENHANCING  
PERFORMANCE OF URBAN LOGISTICS CHAINS WITHIN  
THE FRAMEWORK OF A MARKET ECONOMY  
– APPLICATION TO BRUSSELS-CAPITAL**

Thesis submitted in fulfilment of the requirements for the award of the degree of  
Docteur en Sciences

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2015-2016

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## ACKNOWLEDGEMENTS

This thesis represents an accomplishment of a four-year long journey during which I have investigated the issue of urban consolidation platforms with the aim of contributing to sustainability of our cities. During this period, I had the privilege of discovering a fascinating field of city logistics, of travelling across four different continents to attend conferences and present my research, but most of all of meeting fantastic people. This thesis would not be possible without all the people that I have encountered in my professional and personal life and so I would like to start this dissertation by thanking them.

I would first like to thank Professor Alassane Ndiaye who has not only been my thesis promoter but also a true mentor. Every since he was my professor in my last year of engineering studies, he has transmitted his passion for logistics and inspired me to pursue a research career in this field. He has always provided precious guidance in my work and career and has openhandedly shared his expertise and experience. He has always presented me new opportunities for professional development, allowing me to fully benefit from all the aspects of the work as a researcher.

I would like to thank the members of my thesis committee for the time invested in this thesis and to interesting suggestions that have allowed me to improve the quality of my work.

I would like to thank my colleagues Alexis Nsamzinshuti and Nicolas Rigo. It was always a pleasure to work with you, even when we were facing large amounts of work with short deadlines, since we have always managed to help each-other out and show a real team spirit.

I would also like to thank Philippe Lebeau who collaborated with me within the Prospective Research for Brussels. I would like to thank him for all the interesting exchanges and discussions and for making this project so much more relevant, interesting and enjoyable. I would also like to thank all of the research team from MOBI, Vrije Universiteit Brussel and especially Professor Cathy Macharis for an extremely fruitful collaboration during the four years of this project.

I would also like to thank Professor José Holguín-Veras and his team at Rensselaer Polytechnic Institute where I spent two months in summer 2015 as a visiting scholar. They have shared their humongous experience in this field and provided me valuable feedback for my thesis which was a truly incredible opportunity for me. They have also accepted me as a part of their team and have shown extraordinary hospitality that went beyond all of my expectations.

I would like to thank Charlotte Debroux, Christophe De Voghel and Marianne Thys from Bruxelles Mobilité for their availability and support. They have provided crucial support for this thesis by making available the necessary data for this research project, providing essential feedback and recommendations and suggesting contacts. I would also like to thank all of the LaMiLo project team and especially Gauthier Blicq for the huge work he accomplished and his help in interpreting urban goods movement data. I would like to thank all of my other contacts from the public and private sector who have opened their doors to me and have contributed to my understanding of the real life challenges of city logistics. I would like to thank especially Hinde Boulbayem, Nicolas Etienne, Marc Goossenaerts, Philippe Lovens and Laurent Vanden Broeck.

I would like to thank all my friends that have provided me essential support during all these years, and countless moments of happiness and fun. I feel truly blessed of knowing so many wonderful people. I would like to thank my boyfriend for always supporting me in all my

projects, accepting me for who I am, boosting my confidence and accompanying me across the world on my missions.

Finally, I would like to thank my family. I would like to thank my big sister for providing guidance, be it in my studies and career, in writing a legal document, in making a fashion statement or in life in general. I would to thank my parents who have always provided me with limitless and unconditional support in all of my actions. Everything that I achieved is thanks to them and the opportunities that they have created for me. Thank you!

# FOREWORD

The present PhD thesis is an aggregation of contributions related to the study of urban consolidation platforms. The aim of the first chapter is to set up the general framework and present the general research questions that will be addressed throughout these contributions. The aim of the second chapter is to introduce the local context in which the thesis was elaborated. The complete version of the articles and preprints published in journals or conferences are found in chapters 3 to 9. The chapter 10 provides a general conclusion of the thesis through a synthesized and critical presentation of the scientific contributions that constitute this PhD thesis and discusses the implications of the findings.

This study was supported by the Brussels Institute for Research and Innovation (Innoviris) in the framework of a “Prospective Research for Brussels” programme project entitled “A strategy for the implementation of a sustainable logistics concept for the city distribution of the Brussels-Capital Region” involving two research groups from Université Libre de Bruxelles (PhD candidate: Milena Janjevic, promoter: Prof. Dr. Alassane Ndiaye) and Vrije Universiteit Brussel (PhD candidate: Philippe Lebeau, promoters: Prof. Dr. Cathy Macharis and Prof. Dr. Joeri Van Mierlo).

# ABSTRACT

Urban consolidation centres are a popular measure in city logistics, which aims at rationalizing delivery trips in an urban area. However, although their environmental benefits have been extensively addressed and documented, many of the implementation cases fail to reach sufficient participation and demonstrate a viable business model. Some of the main barriers linked to their implementation are the financial concerns and the stakeholder acceptance. Consequently, the success of these schemes has often been subject to a strong regulatory and financial support from public authorities. Recently, new forms of urban consolidation centre operating models offering a range of value-added activities have appeared, allowing a better integration of these facilities in the overall supply chain. Furthermore, a large number of recent experiments focus on small-scale freight consolidation, relaxing the requirements for material and human resources. The objective of this thesis is to investigate the potential of urban freight consolidation platforms to decrease the costs and improve the performance of urban logistics chains. In particular, the thesis will address factors that influence the viability of these schemes in a framework of market economy.

The thesis is structured around three research questions that address (1) the viability of the traditional urban consolidation centre model based on transshipment and consolidation activities (2) the impact of market-based accompanying measures for urban consolidation centre project implementation and the resulting level of stakeholder support and (3) the impact of new approaches in urban freight consolidation platforms and in particular those of new urban consolidation centres operating models and micro-consolidation platforms. By tackling these aspects, the thesis demonstrates that the traditional urban consolidation centre model can present a viable alternative but that the success of the scheme is subject to a large number of requirements that are often difficult to meet in practice. The thesis highlights accompanying measures that can both increase the expected participation in the consolidation scheme as well as the stakeholder acceptance of the scheme, and those that meet a less positive stakeholder response. Finally, the thesis identifies the potential benefits of new operating models of urban consolidation centres and of small-scale consolidation.

Milena Janjevic is working as a researcher at the Polytechnic School of Brussels at the Université libre de Bruxelles within the research unit Qalinca Labs (BEAMS). This thesis was supervised by Prof. Dr. Alassane Ndiaye.

## RÉSUMÉ

Les centres de consolidation urbaine sont une mesure populaire dans la logistique urbaine visant à rationaliser les trajets liés aux livraisons en ville. Cependant, bien que les avantages environnementaux de ce type de dispositifs ont été largement abordés et documentés, un nombre important de cas d'implémentation n'ont pas parvenu à atteindre une participation suffisante et démontrer un modèle de fonctionnement viable. Les principaux obstacles liés à leur mise en œuvre relèvent des préoccupations financières et de l'acceptation de la part des acteurs de la logistique urbaine. Par conséquent, le succès de ces schémas logistiques est souvent conditionné par un fort soutien réglementaire et financier des pouvoirs publics. Récemment, de nouveaux types de modèles d'exploitation des centres de consolidation urbaine, proposant une gamme d'activités à valeur ajoutée, sont apparus, permettant une meilleure intégration de ces plateformes dans la chaîne d'approvisionnement. En outre, un grand nombre d'expériences récentes se concentrent sur la consolidation de fret à petite échelle, ce qui permet un assouplissement des besoins en ressources matérielles et humaines. L'objectif de cette thèse est d'étudier le potentiel des plates-formes de consolidation de fret urbaines de diminuer les coûts et d'améliorer les performances des chaînes logistiques urbaines. En particulier, la thèse traitera des facteurs qui influent sur la viabilité de ces schémas logistiques dans le cadre d'une économie de marché.

La thèse est structurée autour de trois questions de recherche qui portent sur (1) la viabilité du modèle traditionnel du centre de consolidation urbain basé sur les activités de transbordement et de consolidation, (2) les impacts des mesures qui visent à soutenir la mise en œuvre des schémas de consolidation et le niveau d'approbation des acteurs de la logistique urbaine qui en découle, (3) l'impact des nouvelles approches dans le domaine de plates-formes de consolidation de marchandises en ville et en particulier des nouveaux modèles d'exploitation de centres de consolidation urbains et des plates-formes de micro-consolidation. En abordant ces aspects, la thèse démontre que le modèle du centre de consolidation urbain traditionnel peut présenter une alternative viable, mais que le succès de ces schémas logistiques est soumis à un grand nombre de conditions qui sont difficiles à satisfaire en pratique. La thèse identifie les mesures d'accompagnement qui peuvent à la fois accroître la participation dans le schéma de consolidation et l'acceptation des acteurs, ainsi que celles qui rencontrent une réponse plus mitigée de la part des acteurs. Enfin, la thèse identifie les avantages potentiels des nouveaux modèles d'exploitation de centres de consolidation ainsi que les avantages de la consolidation à petite échelle.

Milena Janjevic travaille comme chercheuse à l'Ecole Polytechnique de Bruxelles de l'Université libre de Bruxelles au sein de l'unité de recherche Qalinca Labs (BEAMS). Cette thèse a été supervisée par Prof. Dr. Alassane Ndiaye.





# TABLE OF CONTENTS

List of figures	15
List of tables	18
List of abbreviations	20
Chapter 1 Introduction	23
1. Urban freight transport	23
2. Urban freight transport measures	25
3. Urban freight consolidation platforms	28
3.1. Urban consolidation centres	28
3.2. Measures supporting the implementation of urban consolidation centres	30
3.3. Barriers linked to urban consolidation centre implementation	31
3.4. Recent developments in design of urban consolidation schemes	34
4. Research questions and scientific contributions	35
5. Thesis outline	37
6. List of contributions	41
7. References	42
Chapter 2 Opportunities for urban freight consolidation in Brussels-Capital Region	49
1. Introduction	49
2. Characterisation of urban freight transport in Brussels-Capital Region	51
2.1. Data collection methodology	51
2.2. Characterization of freight routes based on urban goods movement data	53
2.3. Results	55
3. Identification of potential zones for establishment of the urban consolidation centre facilities	64
4. Conclusion	67
5. References	68

Chapter 3	Investigating theoretical cost-attractiveness of urban consolidation centres for their Users	73
1.	Introduction	73
2.	Scope of the study	74
3.	Literature review	75
4.	Modelling the cost of urban deliveries with and without the urban consolidation centre	79
4.1.	Basic problem: cost of deliveries with and without a urban consolidation centre	79
4.2.	Investigation into the different elements of the generalized cost	82
4.3.	General expression with regards to the cost-attractiveness of the urban consolidation centre(s)	84
5.	Numerical examples: application to Brussels	85
5.1.	Light commercial vehicle	88
5.2.	Trucks and trailers and semi-trailers	95
6.	Conclusion	96
7.	References	99
8.	Appendices	103
8.1.	Annexe 1: cost indexes	103
8.2.	Annexe 2: comparison of vehicle costs for light commercial vehicles	104
Chapter 4	Potential market and optimal location and size of urban consolidation centres	105
1.	Introduction	105
2.	State of the art	106
3.	Model	107
3.1.	Urban goods movement data	110
3.2.	Behaviour of the planner: minimizing the total congestion	114
3.3.	Behaviour of each company and vehicle	115
3.4.	Behaviour of the urban consolidation centre operator	116
4.	Application to Brussels Capital Region	117
5.	Conclusion	119
6.	References	120
Chapter 5	Investigating the financial viability of urban consolidation centre projects	123
1.	Introduction	123
2.	Identification of the costs and revenues linked to urban consolidation centre operations	124
2.1.	Urban consolidation centre revenues	125
2.2.	Infrastructure costs	126

2.3.	Vehicle costs	128
2.4.	Human resources costs	129
2.5.	Equipment costs	130
2.6.	Overhead costs	130
3.	Activity-based perspective of the urban consolidation centre costs	131
4.	Application to an urban consolidation centre servicing Brussels-Capital Region	132
4.1.	Base case scenario	132
4.2.	Influence of the urban consolidation centre throughput	136
4.3.	Influence of the operational metrics for transshipment operations	137
4.4.	Influence of the operational metrics linked to distribution operations	138
4.5.	Influence of the size of vehicles and the size of the delivery area	139
5.	Conclusion	140
6.	References	142
7.	Appendices	145
7.1.	Annex 1: Cost indexes; Source: (CNR, 2016b)	145
7.2.	Annex 2: Vehicle characteristics and costs	146
7.3.	Annex 3: Equipment Cost	148
Chapter 6 Elaboration of strategic scenarios for urban goods distribution in Brussels-Capital Region based on urban consolidation centres		151
1.	Introduction	151
2.	Methodology	152
2.1.	Definition of scope	152
2.2.	Perception analysis	155
2.3.	Trend and uncertainty analysis	156
2.4.	Scenario building	159
3.	Results	164
4.	Conclusion	165
5.	References	166
Chapter 7 Stakeholder-based assessment of urban goods distribution scenarios in Brussels-Capital Region		169
1.	Introduction	169
2.	Stakeholders involvement in city logistics	170
3.	Relevance of MAMCA for a bottom-up approach in strategy formulation	172
4.	Application to a stakeholder consultation in Brussels	173
4.1.	Step 1: Define alternatives	174
4.2.	Step 2: Stakeholders analysis	176

4.3.	Step 3: Define evaluation criteria and weights with stakeholders	176
4.4.	Step 4: Evaluation of the scenarios based on stakeholders' criteria	179
4.5.	Step 5: Analyses	182
4.6.	Step 6: Results	183
5.	Discussion	185
5.1.	Importance of the bottom-up approach	185
5.2.	Contribution of MAMCA in the consultation process	186
5.3.	Towards implementation?	186
5.4.	Limitations of the approach	187
6.	Conclusions	188
7.	References	188
8.	Acknowledgements	193
Chapter 8 Identification of innovative operating models for urban consolidation platforms and their impact on overall performance of urban logistics chains		197
1.	Introduction	197
2.	Using SCOR model for urban consolidation centre projects evaluation	199
2.1.	Current evaluation techniques for the urban consolidation centre projects	199
2.2.	Presentation of the SCOR model	201
2.3.	Relevance of the SCOR model for assessing urban consolidation centres projects	202
3.	Identification of urban consolidation centre operating models	204
3.1.	Selection of the case studies of urban consolidation centres	204
3.2.	Identification of the urban consolidation centre activities	205
3.3.	Summary of different urban consolidation centre operating models	210
4.	Application of SCOR model to different urban consolidation centre operating models	211
5.	Conclusion	216
6.	References	216
Chapter 9 Identification of typologies of micro-consolidation initiatives and key considerations linked to their implementation		221
1.	Introduction	221
2.	Downscaling the consolidation of goods: state of the art and typology of micro-consolidation measures	224
3.	Suggested typology of micro-consolidation initiatives	225
4.	Transferability of micro-consolidation initiatives	229
5.	Conclusion	239
6.	References	239

Chapter 10	Conclusions	243
1.	Urban consolidation platform: a solution for sustainable city logistics?	243
2.	Summary of findings and discussion	244
2.1.	RQ 1: Is the traditional model of urban consolidation centre a viable alternative in the framework of the market economy?	244
2.2.	RQ2: Which accompanying measures support the viability of UCC schemes and what is the resulting level of stakeholder support?	246
2.3.	RQ 3: How do recent models of urban consolidation platforms impact the overall attractiveness of consolidation schemes?	248
3.	Contributions and implications of findings	250
4.	Limitations and future research	253
5.	References	255

## LIST OF FIGURES

Figure 1: Strategies for decreasing negative impacts of urban freight transport.....	26
Figure 2 : Outline of the thesis and structure of the report .....	40
Figure 3 : Freight movements and routes in the FERTURB model.....	52
Figure 4: Two categories of vehicle routes in the FRETURB model.....	53
Figure 5: Density of urban goods movements .....	56
Figure 6: Total number of vehicle movements and vehicle routes according to the vehicle category .....	56
Figure 7: Origin of inbound freight routes servicing the region according to the vehicle category .....	57
Figure 8: Distribution of freight movements according to the activity sector .....	58
Figure 9: Distribution of freight routes according to the activity sectors .....	58
Figure 10 : Average number of freight movements performed within a vehicle route according to the activity sectors .....	58
Figure 11: Density of freight movements for proximity sectors .....	59
Figure 12: Density of freight movements for non-proximity sectors.....	59
Figure 13: Share of vehicle movements according to the organization mode .....	60
Figure 14: Share of vehicle routes according to the organization mode .....	60
Figure 15: Distribution of the number of vehicle movements according to the number of stops served.....	61
Figure 16: Distribution of the number of vehicle routes according to the number of stops served .....	61
Figure 17: Total number of vehicle movements and vehicle routes according to the management mode .....	61
Figure 18: Percentage (1) freight movements and (2) freight routes according to the activity sector for three management modes .....	62
Figure 19: Share of vehicle movements (1) and vehicle routes (2) according to the management mode and the vehicle category .....	63
Figure 20: Average number of freight movements per route according to management and vehicle category.....	63
Figure 21: List of the initial potential UCC sites and the population density in the Region.....	66

Figure 22: Final list of potential UCC sites in Brussels and neighbouring municipalities .....	67
Figure 23: Delivery route without the usage of the UCC.....	79
Figure 24: Delivery route with the usage of the UCC.....	80
Figure 25 : Density of freight movements and location of the origin and the UCC.....	86
Figure 26 : Structure of delivery costs (own account) according to the number of stops .....	89
Figure 27 : Structure of delivery costs (through the UCC) according to the number of stops .....	89
Figure 28 : Total cost of a delivery route und (1) and cost per delivery stop (2) with and without the UCC .....	90
Figure 29 : Sensitivity analysis with regards to vehicle cost parameters.....	91
Figure 30 : Sensitivity analyses with to parameters defining the length of connecting trip .....	91
Figure 31 : Sensitivity analyses with to parameters defining the duration of delivery at UCC and at customer locations.....	91
Figure 32 : Breakeven number of stops for which the use of the UCC is cost-attractive according to the time of delivery to the UCC and the distance from the origin to the UCC .....	92
Figure 33 : Breakeven number of stops for which the use of the UCC is cost-attractive according to the pricing of the UCC services and the number of parcels per stop .....	93
Figure 34 : Breakeven number of stops for which the use of the UCC is cost-attractive according to the density of the delivery zone and the size of the town (town radius) .....	93
Figure 35 : Breakeven number of stops according to the degree of variation of speed according to the density of the area.....	94
Figure 36 : Total cost of delivery according to the type of management and the number of stops within a tour .....	95
Figure 37 : Total cost of delivery with and without the UCC for (1) trucks and (2) trailers.....	96
Figure 38 : Total cost of delivery with and without the UCC for (1) trucks and (2) trailers.....	96
Figure 39: Representation of the delivery routes in an urban area without the UCC.....	108
Figure 40: Representation of the delivery routes in an urban area with the UCC.....	108
Figure 41: Overall modelling structure.....	110
Figure 42: Two types of organization of vehicle routes and three types of freight movements..	111
Figure 43: Optimal UCC locations for 1, 2 and 3 UCCs.....	119
Figure 44: Definition of service areas and location of the UCC for the application to Brussels.	133
Figure 45: Cost structure of the UCC operations according to cost category .....	134
Figure 46: Cost structure of the UCC operations according to the salary index .....	135
Figure 47: Cost structure of the UCC operations according to the type of activity.....	136
Figure 48: Gross margin of the UCC as a function of the UCC throughput.....	137
Figure 49: Gross margin of the UCC as a function of the UCC throughput for a UCC dimensioned to handle 1000 parcels per day.....	137



Figure 50: Adjusted gross margin of the UCC according to variations in the operational metrics .....	138
Figure 51: Adjusted gross margin of the UCC according to the number of tours per day (series) and the load factor of vehicles.....	139
Figure 52: Adjusted gross margin of the UCC according to the number of tours per day (series) and the load factor of vehicles.....	139
Figure 53: Gross margin according to the size of vehicles (1) and the size of the delivery area (2) .....	140
Figure 54: Overall modelling structure .....	162
Figure 55: Optimal locations of the UCCs for the Scenario 1, 2 and 3 respectively.....	164
Figure 56: The seven steps of the MAMCA methodology ; own elaboration based on Macharis (2007).....	174
Figure 57 : Scenarios for the Brussels Capital Region.....	175
Figure 58: Multi-actor view of stakeholder’s preferences for the scenarios .....	183
Figure 59: Uni-actor view of LSPs evaluations for the scenarios.....	185
Figure 60: SCOR as a hierarchical process model (Supply Chain Council, 2012) .....	202
Figure 61: Six major management processes of the SCOR framework (Supply Chain Council, 2012) .....	202
Figure 62: Modelling of the SCOR processes without the urban consolidation centre for Retail-Based UCC .....	213
Figure 63: Modelling of the SCOR processes with the urban consolidation centre for Retail-based UCC .....	214
Figure 64: Urban Logistics Spaces; Source: (Boudouin, 2012) .....	225
Figure 65: Typology of micro-consolidation schemes .....	228
Figure 66: Framework for the transferability of micro-consolidation measures to a target city ..	231
Figure 67: List of attributes for characterizing the case study and the environment in which it was developed; Source: own elaboration.....	233
Figure 68 : Necessary conditions for a viable UCC operations.....	246
Figure 69 : Impact of the supporting measures on the viability of UCC operations .....	247
Figure 70 : Impact of the value-added services on the viability of UCC operations.....	249
Figure 71 : Impact of micro-consolidation on the viability of the consolidation platforms.....	250

## LIST OF TABLES

Table 1: Notations .....	54
Table 2: Identification of potential UCC sites based on urban planning documents .....	65
Table 3 : Notations .....	80
Table 4: Pricing of the UCC services.....	84
Table 5: Average driving speed according to the density of the area and the period of the day....	86
Table 6: Distance-based and time-based costs of vehicles .....	87
Table 7: Parameter values for light commercial vehicles delivering in a medium density zone, hired transport.....	88
Table 8 : Parameter values for trucks and trailers delivering in a medium density zone, hired transport.....	95
Table 9: Analysis of characteristics of 18 light commercial vehicle models available for Belgian market.....	104
Table 10: Notations for the length and duration of delivery routes .....	111
Table 11: Notations for the spatial distribution of delivery routes .....	113
Table 12: Notations for the behaviour of the planner .....	114
Table 13: Notations used for the behaviour of each vehicle .....	115
Table 14: Notations used for the behaviour of the UCC operator.....	116
Table 15: Parameter values used in the application to Brussels .....	118
Table 16: Throughput, size and decrease in km-EPC for optimal configurations with 1,2 and 3 UCCs servicing Brussels.....	119
Table 17: Notations used in the model.....	125
Table 18: Pricing of the UCC services.....	126
Table 19: UCC surface and daily throughput of consolidation centres .....	127
Table 20: UCC surface and number of operational and clerical staff.....	130
Table 21: Operational metrics relevant to transshipment operations .....	131
Table 22: Operational metrics relevant to distribution operations .....	132
Table 23: Parameter values for the base-case scenario of a UCC in Brussels .....	133
Table 24: Synthesis of characteristics of 24 LCV models available for Belgian market .....	146

Table 25: Analysis of characteristics of 24 LCV models available for Belgian market.....	147
Table 26: Analysis of lease price of equipment.....	148
Table 27: Evaluation of decision scenarios with regards to business as usual.....	164
Table 28: Identification of stakeholders in city logistics.....	177
Table 29: Objectives of the stakeholder's groups and their importance.....	177
Table 30: Summary of indicators and evaluation used for estimating the criteria.....	180
Table 31: Evaluation of the scenarios compared to the business as usual scenario.....	182
Table 32: Overview of UCCs case studies.....	204
Table 33: Overview of UCCs case studies and activities from the literature review.....	210
Table 34: Performance metrics for various operating models (R=receiver, T=transporter/shipper, C= private customer.....	215
Table 35: List of analysed case studies.....	226
Table 36: Analysis of market segments relevant to the case studies.....	232
Table 37: Characteristics of Urban Logistics Spaces used in the case studies.....	236
Table 38: Characteristics of Urban Logistics Spaces used in the case studies.....	237
Table 39: Importance of transferability attributes for each case study.....	238