

# Content

<b>1</b>	<b>Introduction.....</b>	<b>1</b>
1.1	Objective of the Study .....	2
1.2	Procedure of the Study.....	4
<b>2</b>	<b>Security Measures and Their Perception in Critical Infrastructure Context.....</b>	<b>5</b>
2.1	Security and Its Research Players.....	5
2.2	The Vulnerability of Public Transportation.....	7
2.3	Effects of Security Measures: Risk Management Systems.....	11
2.4	Security as Part of Customers' Confidence and Satisfaction.....	14
2.5	Security Perception.....	16
2.6	Non-/Acceptance of Security Measures.....	18
2.7	Summary of the Literature.....	22
<b>3</b>	<b>Research Concepts .....</b>	<b>25</b>
3.1	Research Assumptions and Hypotheses.....	25
3.2	Conceptual Frame of Security Perception and Security Measure Acceptance.....	26
3.3	End-User Requirements.....	30
3.4	Limitations.....	31
<b>4</b>	<b>Acceptance of Security Measures .....</b>	<b>33</b>
4.1	Concept of the Survey .....	34
4.1.1	Development of Methodology for Data Acquisition and Analysis.....	36
4.1.2	Structure of Survey and Execution.....	37

4.2	Step 1: Database of Security Measures.....	39
4.3	Step 2: Translation Process of Security Measures into Interference Criteria.....	40
4.3.1	Consequence Categories as Part of Customer Perception .....	41
4.3.2	Translation into Interference Criteria .....	41
4.4	Step 3: Survey—Data Analysis .....	44
4.4.1	Online Survey Results .....	45
4.4.1.1	Analysis of Respondents’ Security Perceptions— Online Survey.....	46
4.4.1.2	Acceptance of Interference Criteria Caused by Security Measures .....	52
4.4.1.3	Ranking of Acceptance of Negative Impact Caused by Security Measures .....	58
4.4.2	Field Survey Results.....	61
4.4.2.1	Analysis of Respondents’ Security Perception— Field Survey.....	63
4.4.2.2	Acceptance of Interference Criteria Caused by Security Measures .....	73
4.4.2.3	Ranking of Acceptance of Negative Impact Caused by Security Measures .....	79
4.4.3	Comparison of Online Survey versus Field Survey.....	83
4.4.4	Further Expert Interviews and Panel Discussion.....	91
4.4.4.1	Expert Validation of Soft Interference Criteria— Travel and Preparation Time .....	91
4.4.4.2	Customer Panel Discussion of Soft Interference Criterion—Information .....	95
4.4.5	Interference Ranking and Discussion of Survey Results.....	99
4.5	Step 4: Acceptance Matrix of Security Measures Re-translation Process.....	103
4.6	Summary and Results of the Acceptance Analysis.....	112

<b>5 Application—Integration of the Data into Risk Management Systems.....</b>	<b>115</b>
5.1 Multi Criteria Decision Analysis in Risk Management.....	116
5.1.1 Criterion 1: Technical/Objective Effectiveness of Preventive Security Measures .....	121
5.1.2 Criterion 2: Costs of Security Measures.....	124
5.1.3 Criterion 3: Acceptance of Security Measures .....	127
5.2 Example Scenario for Application.....	128
5.3 Data Aggregation for Decision Criteria.....	129
5.4 Decision Making Process and Sensitivity Analysis.....	142
5.5 Summary and Results of the MCDA for End-users' Risk Management .....	145
<b>6 Synthesis.....</b>	<b>151</b>
6.1 Discussion of the Methodology .....	152
6.1.1 Verification of Results.....	152
6.1.2 Pros and Cons of an Acceptance Indicator Based on Interference Criteria.....	157
6.2 Comparison to Other Social/Technical Studies .....	158
6.3 Reflections on Theory/Future Research Needs.....	163
<b>7 Conclusion .....</b>	<b>167</b>
<b>References.....</b>	<b>171</b>
<b>Annex A—List of Security Measures in Public Transportation System....</b>	<b>181</b>
<b>Annex B—Questionnaires of Survey.....</b>	<b>193</b>
<b>Annex C—Process Modeling—Results Expert Workshop.....</b>	<b>203</b>
<b>Annex D—Data Sheet and Report MCDA Software .....</b>	<b>209</b>

Securing Public Transportation Systems  
An Integrated Decision Analysis Framework for the  
Prevention of Terrorist Attacks as Example

Brauner, F.

2017, XXII, 213 p. 69 illus., 10 illus. in color., Softcover

ISBN: 978-3-658-15305-2