SECONOMICS

D3.4 – Model Validation

R. Munné, Iván Zaldivar (ATOS), M. Pellot (TMB), Petra R. Guasti, Zdenka Mansfeldová (ISAS CR), Javier Cano (URJC) Alessandra Tedeschi, Alessandro Pollini (DBL), Fabio Massacci, Woohyun Shim (UNITN), Ruprai Raminder (NGRID)

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1	UNIVERSITÀ DEGLI STUDI DI TRENTO	Università Degli Studi di Trento (UNITN) 38100 Trento, Italy www.unitn.it	Project Manager: prof. Fabio MASSACCI Fabio.Massacci@unitn.it
2	DEEPBLUE	DEEP BLUE Srl (DBL) 00193 Roma, Italy www.dblue.it	Contact: Alessandra TEDESCHI Alessandra.tedeschi@dblue.it
3	Fraunhofer ISST	Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung e.V., Hansastr. 27c, 80686 Munich, Germany http://www.fraunhofer.de/	Contact: Prof. Jan Jürjens jan.juerjens@isst.fraunhofer.de
4	Universidad Rey Juan Carlos	UNIVERSIDAD REY JUAN CARLOS, Calle TulipanS/N, 28933, Mostoles (Madrid), Spain	Contact: Prof. David Rios Insua david.rios@urjc.es
5	UNIVERSITY OF ABERDEEN	THE UNIVERSITY COURT OF THE UNIVERSITY OF ABERDEEN, a Scottish charity (No. SC013683) King's College Regent Walk, AB24 3FX, Aberdeen, United Kingdom http://www.abdn.ac.uk/	Contact: Dr Matthew Collinson matthew.collinson@abdn.ac.uk
6	TMB Transports Metropolitans de Barcelona	FERROCARRIL METROPOLITA DE BARCELONA SA, Carrer 60 Zona Franca, 21-23, 08040, Barcelona, Spain http://www.tmb.cat/ca/home	Contact: Michael Pellot mpellot@tmb.cat
7	Atos	ATOS ORIGIN SOCIEDAD ANONIMA ESPANOLA, Calle Albarracin, 25, 28037, Madrid, Spain http://es.atos.net/es-es/	Contact: Alicia Garcia Medina alicia.garcia@atos.net
8	SECURENOK	SECURE-NOK AS, Professor Olav Hanssensvei, 7A, 4021, Stavanger , Norway Postadress: P.O. Box 8034, 4068, Stavanger, Norway http://www.securenok.com/	Contact: Siv Houmb sivhoumb@securenok.com
9	SOÚ Institute of Sociology AS CR	INSTITUTE OF SOCIOLOGY OF THE ACADEMY OF SCIENCES OF THE CZECH REPUBLIC PUBLIC RESEARCH INSTITUTION, Jilska 1, 11000, Praha 1, Czech Republic http://www.soc.cas.cz/	Contact: Dr Zdenka Mansfeldová zdenka.mansfeldova@soc.cas.cz
10	nationalgrid THE POWER OF ACTION	NATIONAL GRID ELECTRICITY TRANSMISSION PLC, The Strand, 1-3, WC2N 5EH, London, United Kingdom	Contact: Dr Ruprai Raminder Raminder.Ruprai@uk.ngrid.com
11	ANADOLU ÜNİVERSİTESİ	ANADOLU UNIVERSITY, SCHOOL OF CIVIL AVIATION Iki Eylul Kampusu, 26470, Eskisehir, Turkey	Contact: Nalan Ergun nergun@anadolu.edu.tr

12	Durham University	The Palatine Centre, Stockton Road, Durham, DH1 3LE, UK	Contact: Prof. Julian Williams julian.williams@durham.ac.uk

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Executive summary

This report presents the model building and validation process for the Urban Transport. The models have been developed for the Security and Society and Security risk domains as these are the most applicable to the urban transport scenarios.

The models have been developed by the technical work-packages, WP4 and WP5, with the support of the Urban Transport WP. The models have been developed after a selection process on the most adequate and interesting scenarios for the use case, taking into account the interest of the stakeholders and which of them cover the most recent security threats in the Urban Transport domain.

The use case has been provided to the technical work-packages with all the information describing each scenario, and the required data for the model building process. For each of the models a slight different process has been followed. In case of social model, the information on security incidents and passengers complaints was provided to complement the media analysis done initially by ISAS CR, which provided information on the specific security scenarios with a social impact. For the design of the risk model, based on the templates of the Adversarial risk analysis methodology (ARA), the process consisted in selecting the most appropriate scenarios and approach and then providing the data required by the technical work-package for the fine design of the model.

Finally, a validation step on the scenarios has been done, with the participation of stakeholders in two workshops. Additional information has been collected during these workshops on future and emerging threats, especially in regard to the social dimension and the internationalisation of some of the already existing security threats, which are evolving into new forms of problems that must be addressed with a different approach. The question of pan-European coordination has been also discussed by the stakeholders during these workshops, specifically in regard to the coordination of law enforcement agencies and other initiatives at European level, funded from the European Commission Directorate-General for Mobility and Transport (DG MOVE).

The approach and the models provided were considered quite appropriate for their use in the public transport domain. For the social model the effects of security human resources on customer satisfaction and the impact of the application of technical resources and new technologies on the security scenarios were defined. For the risk model, it can be easily extended to consider additional scenarios by adapting the methodology to the specific countermeasures required by them.

1. Introduction

1.1 Scope of report

This report describes the model building and evaluation process for the Urban Transport use case, developed during the second year of the project. It takes the requirements and scenarios described during the first year in the requirements deliverables, D3.2 and D3.3, and from this groundwork were selected the most interesting scenarios for the stakeholders. For Transport Use Case scenarios, it was agreed that the most appropriate models to be developed were Security and Society model (WP4) and Security Risk model (WP5).

The report also explores how urban transport future and emerging threats impact on these models. For example, it can be assessed in the confluence of factors for fraud scenarios, civil disobedience promoting not paying and the promotion of producing fake tickets.

As regards the Pan-European coordination for security threats, there are some initiatives at European level closely related with the security scenarios considered for the model development. During the validation workshops some inputs were collected regarding those Pan-European coordination initiatives already existing or most requested by the stakeholders.

The models developed during this phase of the project will be the base for decision making tools that will be validated in the last year of the project to ensure that the users' requirements are satisfied.

1.2 Report Objectives and Results

The objectives and results presented in this report are the following:

- To provide the information on the motivations, process and parameters for the selection of the most appropiate scenarios to be modeled;
- To describe the model building process for both social scenarios model and risk scenarios model;
- To describe the model validation methods and criteria as well as report the performed validation activities and the feedback collected;
- To report the dissemination activities performed to introduce the models to similar organizations;
- To describe the impact of future and emerging threads on the scenarios selected for the modelling process;
- To identify Pan-European coordination initiatives, in place or requested by stakeholders, according to the security scenarios;
- To identify the trends for new and emerging threats.

The modelling activities have been successfully completed with the results showing the detailed analysis of the models for the security scenarios based on risk and sociological impacts. The validation has been performed by the urban transport stakeholders, who have mostly agreed with the approach of the models. The stakeholders also provided

very useful inputs for the on-going and desirable Pan-European coordination initiatives, as well as for the trends of emerging threats.

2. Scope of the Models

The first point in this section reports the potentially more interesting scenarios for the stakeholders, according to the inputs gathered in the presentations and workshops conducted so far. The second part reports the arguments behind the selection of the specific scenarios to be modelled. This takes into account the interests expressed by the stakeholders and the information collected in the requirements documents produced in the first period of the project.

2.1 Interests of Stakeholders in security scenarios to be modelled

The main goal of the first Worksop with TMB's stakeholders, held in June 2012, was to identify the more relevant scenarios for those stakeholders. These scenarios were described in D3.2 [1]. The definition of those scenarios evolved with the contributions received mainly from transport stakeholders and are summarised in Table 1 below.

Table 1: Evolution of scenarios for the urban transport use case

First version Scenarios (D3.2)	Final version Scenarios (D3.3)
Tramps / sleepers	Indicators of economic crisis
Fare Evasion by Individuals or by Collusion	Fraud
Vandalism and Graffiti	Graffiti
Pickpocketing	Pickpockets

The final scenarios used in the definition of the models are those described in D3.3 [2]. Figure 1 below summarizes the scenario definition process.

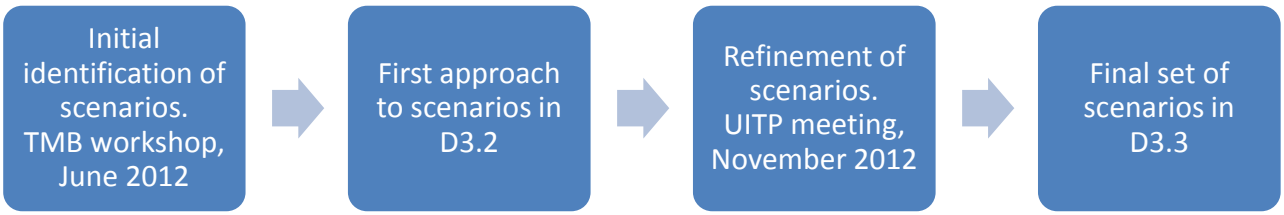

Figure 1: Scenario definition process

In the process of describing the scenarios, it was not enough to identify them but to analyse and identify the motivations that made offenders participate in the different types of incidents, see Table 2 below. Considering these, makes it possible to determine the most appropriate measures to counteract the different types of incidents. For example, the way to fight individual fraud might be very different from the way to fight collective fraud as the motivations of attackers are very different. Three types of motivations were identified, initially drafted in project report D3.2 [1], and later developed in D3.3 [2]: Uncivic, Antisocial and Criminal.

Table 2: Description of motivations behind the incidents for the scenarios considered

Motivations
Uncivic behaviour: Individual and / or sporadic behaviour not adjusted to socially accepted code of conduct, which causes a state of uneasiness and discomfort in people who witness it.
Antisocial behaviour: Behaviour of an organized nature and / or intentional or recidivist involving violations of criminal or administrative regulations with a clear social disdain.
Criminal behaviour: Behaviour defined in the criminal laws in force.

The scenarios were defined in the first version of requirements in D3.2 [1] and the motivations were presented to the expert group of the UITP[1] Security Commission. Within this commission the discussion focused on the definition of the scenarios that were later described in the final version of the requirements in D3.3 [2], as well as on the precise definitions of the motivations, developing them to their current definitions included also in D3.3 [2] (see Table 2 above).

In order to prioritize the scenarios for the transport use case, a survey was submitted to the UITP security commission members (formed by the security staff from urban transport operators) to gather, among other things, which are the security priorities in their organizations. The conclusion is that, in general, security issues related to passenger's real security, facilities security and passenger's perception are the most voted by experts. This survey and its results are reported in D3.3 [2].

To determine the social impacts of security priorities in public transport, it was raised the question "which are the main social impacts taken into account for the decision making process related to the security dimension within the organizations". Most answers highlighted the internal acceptability and the internal policies of the organizations, legal aspects, public security and social and economic dimensions.

These answers suggest that scenarios with an economic and social impact in public transport operators and users (such as fraud and pickpocketing) are the most popular.

2.2 Selection of scenarios for model building

According to the interests of the stakeholders and the emerging threats reported in D3.3 [2], the scenarios have been selected as a response to these facts. Additionally, in urban transport, social and risk dimensions have more weight than the economic dimension given that urban transport is a mean of mass transportation with a potentially high impact from any security incident.

The review of the scenarios described in D3.3 [2] and the social and economic impact reported there provide the basis for the selection of the scenarios. The following is a review of the scenarios according to the social and economic impact of each:

Indicators of economic crisis scenario impacts

[1] UITP: International Association of Public Transport

The economic impact of the activities covered by this scenario is low, as they do not affect directly any of the business activities. However, in terms of social impacts it is considered high for the activities carried by illegal profit-driven organizations of beggars and hawkers, but such activities have a low impact on the passengers' security perception.

Fraud
There is an obvious economic impact in this scenario due to the loss caused by unpaid tickets, the scams and fake tickets. Nowadays, as an emerging threat, the social impact of the protest groups who organize activities to commit collective and organized fraud is very high, as these activities are usually reported in the local media. At the same time there is an emerging threat, not so relevant for the moment but important for the potential impact, of groups promoting the production of fake tickets using the internet as the means of disseminating the technical knowledge required to do that. The risk to the sustainability of the service is high and therefore it is necessary to take the appropriated counter-measures to minimize their effects.

Graffiti
The economic impact on the rail operator is very high, both for the costs of cleaning and maintaining trains and facilities (doors, windows, grilles), and the vandalization of security equipment performed by these groups. However, the social impact is not as high as it could be, as these activities are usually performed overnight, and therefore not affecting the passengers' security perception.

Pickpockets
The users who would stop using public transport in fear of being stolen are estimated to be a minority so the economic impact of this type of incident could be considered as very low. Nevertheless, the social impact could be considered as medium to high, especially when the activity level of this phenomenon exceeds the tolerable and acceptable thresholds at the social level and this criminal activity reaches the media.

The three main drivers of the emerging threats for security scenarios reported in D3.3 [2] were:

- Transnationality of the activities
- The activities are performed by organized groups with antisocial or criminal nature
- The use of new technologies

Table 3 presents a summary showing the relation between the scenarios considered in the study and the impact from the emerging threats drivers.

Table 3: Relation between scenarios and emerging threats drivers'

	Emerging threats drivers'		
Scenarios	**Transnational activities**	**Organized activities**	**Impact of new technologies**
Indicators of economic crisis		Low impact	
Fraud		***High impact***	***Medium impact (and growing)***
Graffiti		Medium impact	
Pickpockets	***High impact***	***High impact***	

From the assessment of the scenarios it can be summarized that those with the highest social and risk impact are fraud and pickpocketing, with fraud having a high economic impact. Besides, according to Table 3 these scenarios are the ones with the highest impact from emerging threats drivers'.

Therefore, the activities selected to be modelled are those from the fraud and pickpocketing scenarios with a clear impact form the emerging threats drivers, as shown in Table 4.

Table 4: Scenarios to be modelled

Selected scenarios	**Security and society (WP4)**	**Security risk model (WP5)**
Impact of new security measures (introduction of new technology for automatic doors generate personal conflicts)	✓	
Civil disobedience, promoting not to pay (using internet social platforms)	✓	
Promotion of producing fake tickets (tutorials available in the internet)	✓	
Individual fare evaders (are the reference for the new forms of fare evasion)		✓
Colluding fare evaders (using actively social networks)		✓
Organised pickpocketing (transnational organized groups)		✓

2.3 High level description of models

This section gives a high level description of the models developed by the technical work packages for the social and risk models.

2.3.1 Social Model (WP4)

For the elaboration of the social model on the salience and acceptance of security measures, three types of information have been analysed and linked together in studying the effects of CCTV, single guard, guard with doc and automatic reversible door on customer satisfaction and acceptance, as reported in D4.3 [3]:

- Media analysis of articles regarding the impact of CCTV for various European countries and U.S. For WP3 have been analysed two Spanish newspapers during 2010-2013 (focusing on three different topics, 3D body scanner, **CCTV cameras**

and Stuxnet[2])
- Security data from TMB on security incidents in the metro (2011-2013, categorized by security issues)
- TMB passenger complaints data (2011-2013, categorised by security issues)

Media analysis: Conclusions from this analysis is that CCTV is the most important topic among the three analysed in this research in terms of number of articles published, most of them regarding the implementation of CCTV in Spanish cities. In conclusion, the use of CCTV is not controversial as they seem to be quite accepted by most citizens as long as this system respects data protection legislation. It is supported as a good measure to fight against petty crimes and daily criminality. Stakeholders consider that CCTV can be a good tool to fight against burglary or vandalism.

Analysis of TMB security and passenger complaints data: TMB data on reported security incidents was analysed combined with passenger complaints, to provide insights into public acceptance of security measures. From the total of 19.606 security incidents analysed, 48,96% were related to fare evasion (fraud). These incidents related with fraud were reported as:
- Uncivic behaviour
- Assaults
- Screen access doors broken
- Threats

Passengers' complaints were grouped into three categories that were:
- Uncivic behaviour of other passengers
- Ticket inspector behaviour
- Fare evasion

Critical Salience Index has been designed based on annual data on number of complains and on number of reported incidents per year to express critical attitudes (i.e. negative salience) of passengers towards the three complaints categories selected. Overall, very low negative salience of all three issues of passenger complaints is identified. The main findings can be summarized as follows: 1) the critical perception/rejection of uncivic behaviour and especially of fare evasion decreases significantly over time; 2) critical perception of ticket inspector's behaviour grows over time.

Further analysis will show the extent to which critical salience is influenced by macro societal factors such as the on-going crisis in Spain or by specific factors such as growth in ticket prices in TMB.

Overall, the selected issues do not represent the main body of concerns to customers. Significant variation can be found among the three issues, with Ticket Inspectors behaviour being perceived most critically by the TMB customers and uncivic behaviour least critically. The number of complaints regarding the fare evasion decreased

[2] WP4 partners also analysed 3D body scanner and Stuxnet for WP1 and WP2 models, respectively.

significantly over time and hints towards growing tolerance of passengers to this form of behaviour. In the context of the ongoing economic situation in Spain, it can be hypothesized that fare evasion is more tolerated as the economic crisis affects customers. In the same line of argument, in the times of economic hardship customers become more aware of the costs of the ticket and their expectation of Ticket Inspectors' behaviour rises, leading to more critical attitudes.

Social Model: The following Table 5 summarizes the findings from the social model which were validated during the validation workshops with stakeholders.

Table 5: Validated model based on the effects of security measures

Type of security measure		Cost		Profit		Effect on customer Satisfaction/ Level of acceptance
Duration		short-term	long-term	short-term	long-term	n/a
Human resources	Single guard	high	medium	low	low	rather negative/low
	Guard with dog	high	medium	medium	medium	negative/low
Technical resources	CCTV cameras	high	low	medium/high	high	neutral/high
	Automatic reversible doors	high	low	high	high	negative/low

I. Costs

I.1. Human Resources Costs

Values: high - medium

High: personnel recruitment, personnel initial training (taking into consideration personnel turnover), additional/specific training (e.g. in connection with new technologies). This has to be included in company's Human Resources development plan, as well as in medium to long- term strategy (increase/decrease of personnel in connection with new technologies);

Medium: regular costs, i.e. wages;

I.2. Technical Resources Costs

Values: high - low

High: purchase (one-time cost), installation of new equipment;

Low: regular maintenance, ad-hoc repairs;

II. Profit

Values: Low – Medium – High

This is a relative category, based on the increase/decrease of ticket sale-related profit **due to effectiveness of the Human Resources/technical measures (e.g. decrease in fare evasion);**

III. Effect on Customer Satisfaction

Values: low – high; Direction: negative – neutral
This category is related to the effect the measure will have on:

1) customer satisfaction
2) level of acceptance (decrease in negative salience, passenger complaints);

This model has been used to assess the impact of security measures on the scenario on *Fraud due to uncivic and antisocial motivations*. An infographic of the scenario and the conclusions from the application of the model is provided below in Figure 2.

The results of the application of the model to the TMB case can be summarized in the following three points:
(1) Based on TMB assessment, the effect of human resources on customer satisfaction varies – A guard with dog is less accepted than a single guard (i.e. rather negative/low, according the experience from TMB staff);
(2) as for technical resources, the initial TMB assessment is as follows - CCTV cameras (acceptance neutral/high), this was further confirmed by WP4 media analysis for both Spanish and especially Catalan newspapers;
(3) as for reversible automatic doors – the level of acceptance is low (due to novelty, and new forms of fare evasion including inhibiting personal space of paying customer by fare evader). The infographics for the social model scenario is provided below in Figure 2.

SECONOMICS - SCENARIO

Fraud due to uncivic and antisocial motivations

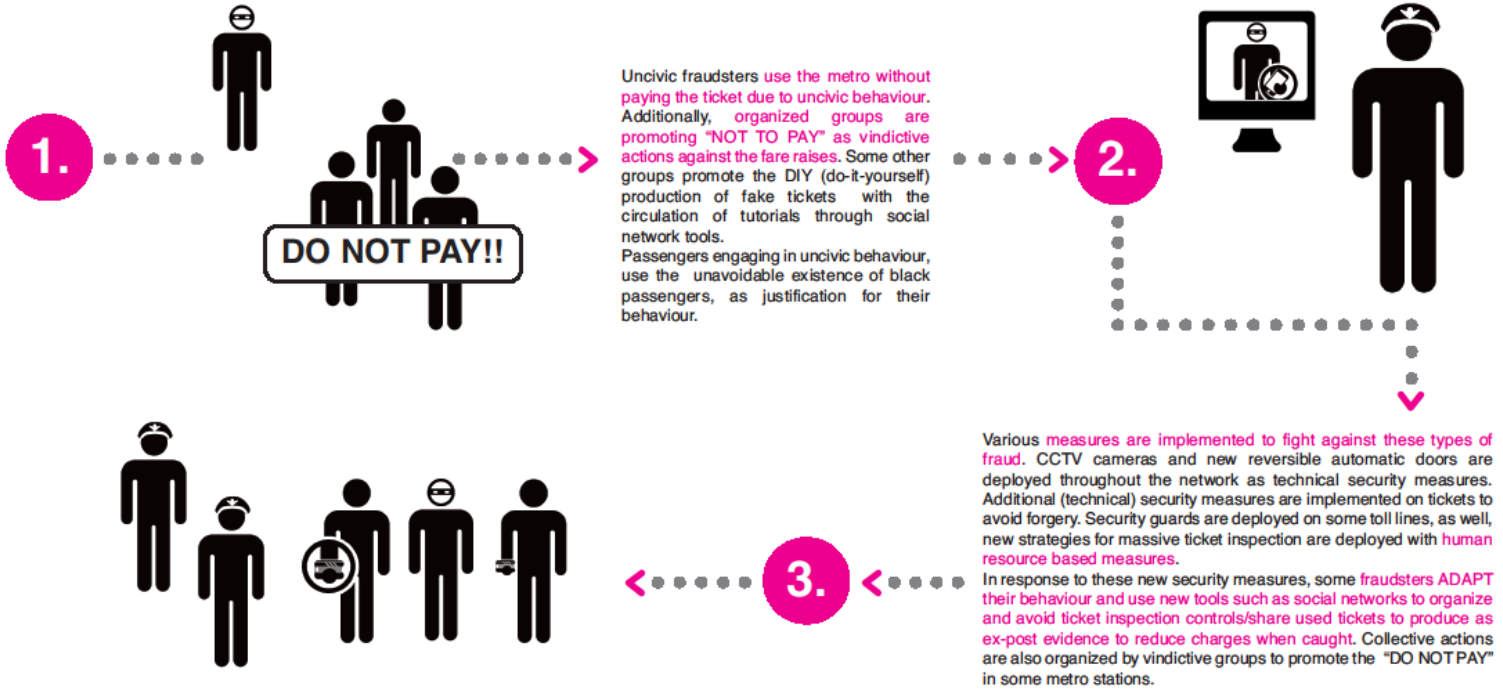

Figure 2: Social Model Scenario

2.3.2 Risk Model (WP5)

The selected scenarios for the production of the security risk model have been the individual and organised fare evaders and the organised pickpockets. The rationale for such selection is detailed in Section 2.2.

The fare evaders' scenario considers that the organized fare evaders have some level of "intelligence", while the individual ones have a random behaviour. The countermeasures applied have more impact on the individual evaders than on the organized ones. Due to this organization, they are able to overcome the countermeasures taken by the transport operator.

For the pickpocketing scenario, the pickpockets have such level of knowledge on criminal regulations that they are able to select their victims in order to take the most advantage from their situation. The weakest and with biggest return are selected, mainly tourists.

The infographics for the risk model scenarios are provided below in Figure 3 and Figure 4.

SECONOMICS - SCENARIO

Standard and organized fare evaders (fraud)

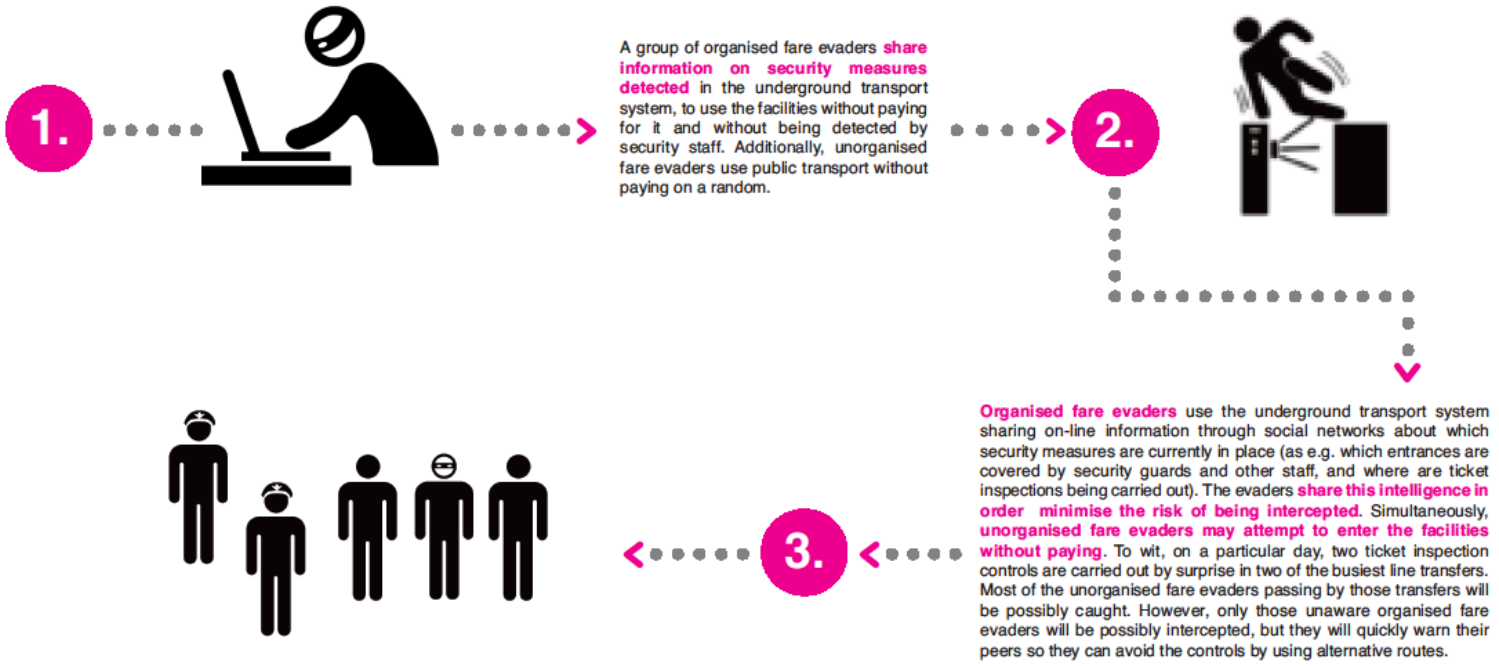

Figure 3: Risk Model - Fraud Scenario

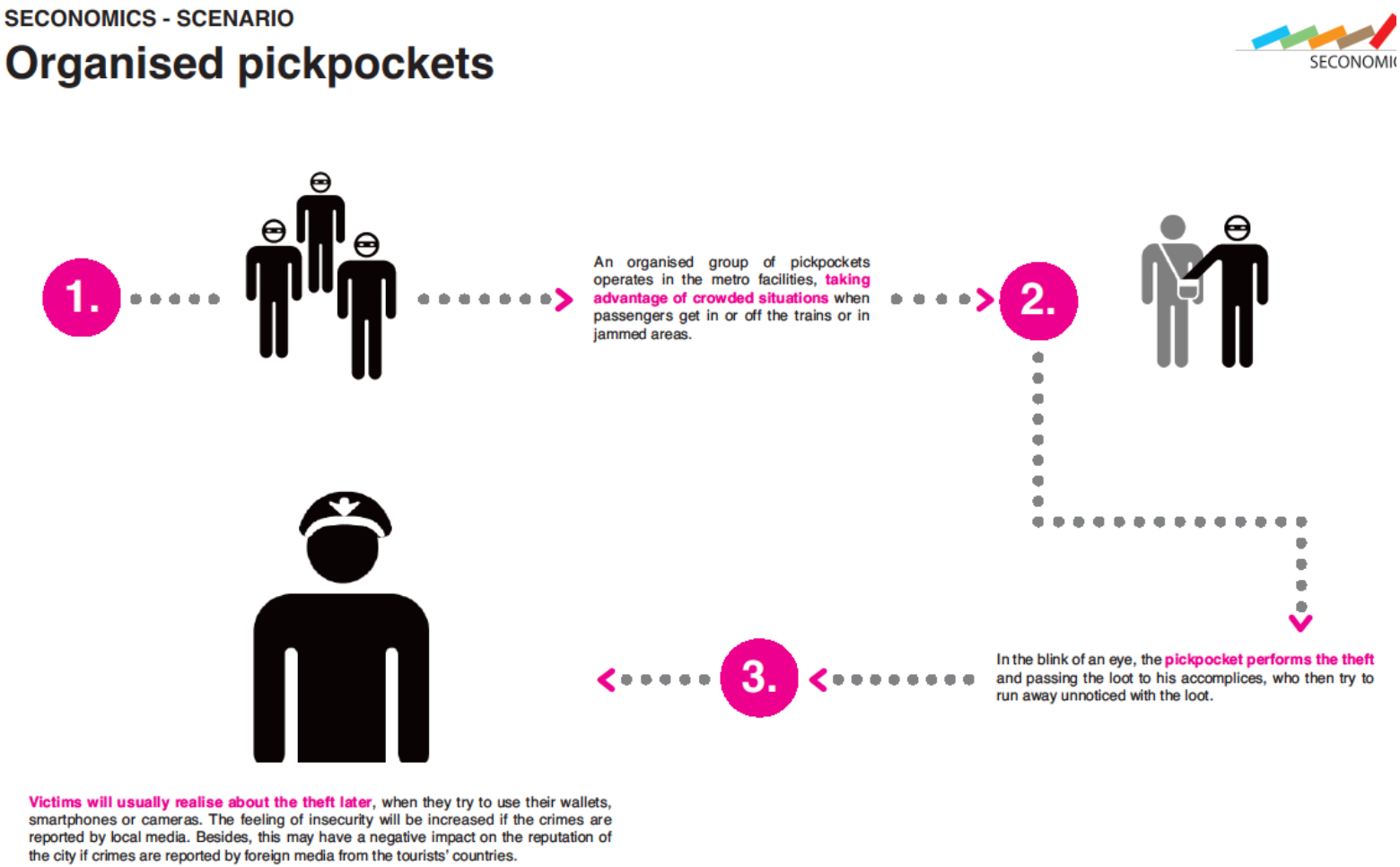

Figure 4: Risk Model - Pickpockets Scenario

3. Model building

The construction of the models is a process started by the definition of the target scenarios, followed by a proposal and feedback loop for the refinement and validation of the models. The definition of the models from the two technical aspects considered for the scenarios proposed -security and society and risk scenarios- has followed this basic approach but with some differences in practice. Additionally, the model for social scenarios has studied the salience of security measures based on a media analysis in the first place, and later, has continued with the analysis of the salience and acceptance of security measures for the scenarios considered.

3.1 Modelling process for social scenarios (WP4)

The modelling process for social scenarios has been a collaborative work between the leading partners of the transport case study, ATOS and TMB, and the leading partner for the security and society technical work package, ISAS CR. This collaboration included exchange of information, meetings and validation workshops.

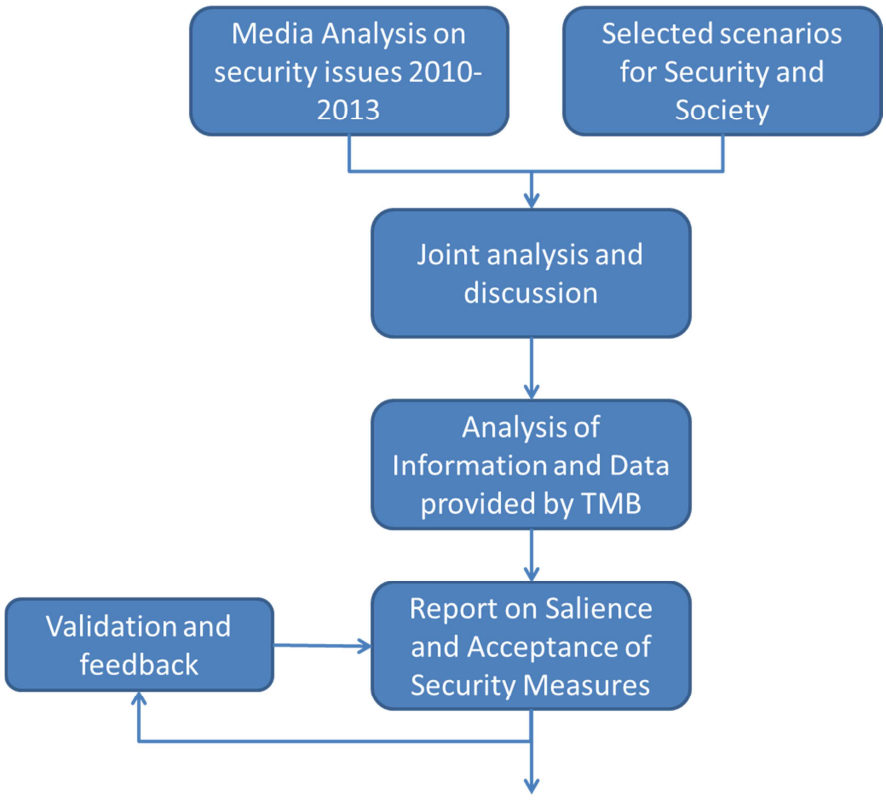

Figure 5: Security and Society model building process

On the one hand, ISAS CR started to analyse Spanish media on security topics related with public transport (CCTV cameras) as reported in D4.3 [3]. On the other hand, it was discussed and finally proposed the selected scenarios to be analysed in this phase of the work:

- Impact of new security measures (the introduction of new technology for automatic doors cause personal conflicts among passengers who validate their ticket and fraudsters that try to pass the toll very close to the back of the passenger)
- Civil disobedience, promoting not to pay (using internet social platforms)
- Promotion of producing fake tickets (tutorials available in the internet)

A joint analysis of the information provided and the scenarios was performed in a meeting held in Barcelona on 6-7 of June 2013. From that meeting, a first picture of the analysis was drafted and additional data was requested to TMB about facts and figures related to security:

1. Customer satisfaction data (2007 -2012)
2. Complaints data (2011 -2012, and first half 2013)
3. Incidents data (2011 – 2013)
4. Information about the price of most common ticket (2007-2013)
5. Costs over time (2007-2013)
6. Number of passengers per year (2007-2013)
7. Construction of the overall satisfaction and security satisfaction surveys by TMB

ISAS CR analysed the information provided and a first version of the Report on Salience and Acceptance of Security Measures was provided. It received feedback from the Transport Use case members and was validated in a joint validation workshop.

3.2 Modelling process for risk scenarios (WP5)

The modelling process for risk scenarios has been a collaborative work between the leading partners of the transport case study, ATOS and TMB, and the leading partner for the security risk models technical work package, URJC. This collaboration included exchange of information, meetings and validation workshops. The scenarios considered for this modelling process were:

- Individual fare evaders
- Colluding fare evaders
- Organised pickpocketing

Firstly, URJC produced a first draft of the study “Adversarial and Non-Adversarial Risk Analysis over Multiple Sites: An Underground Transportation Case”, which is part of D5.2 [4], where the following scenarios were considered for just one metro station:

- One case where only unorganized fare evaders are present
- One case where only colluders are present (organised fare evaders)
- A third case where the previous both cases are joint

A first meeting was held with URJC through a teleconference on the 22nd March 2013. The following information was provided to URJC: the definition of the evader’s types -and how they can dynamically change over the time-, the type of countermeasures applied to fight against fraudsters and how are they applied, and the costs for the evaders (fines) and the operator.

A second meeting was held with URJC in Barcelona on the 2nd May 2013. During this meeting the countermeasures proposed in the paper were discussed, in particular about what is feasible and what is not. Additional information was provided regarding the pickpockets case, since this scenario covers a network of stations as pickpockets move dynamically from one station to another to catch their victims on trains, platforms or hallways of the stations. Information was provided regarding the type of countermeasures against pickpockets and how they are applied as well as the possible consequences for them if they are caught.

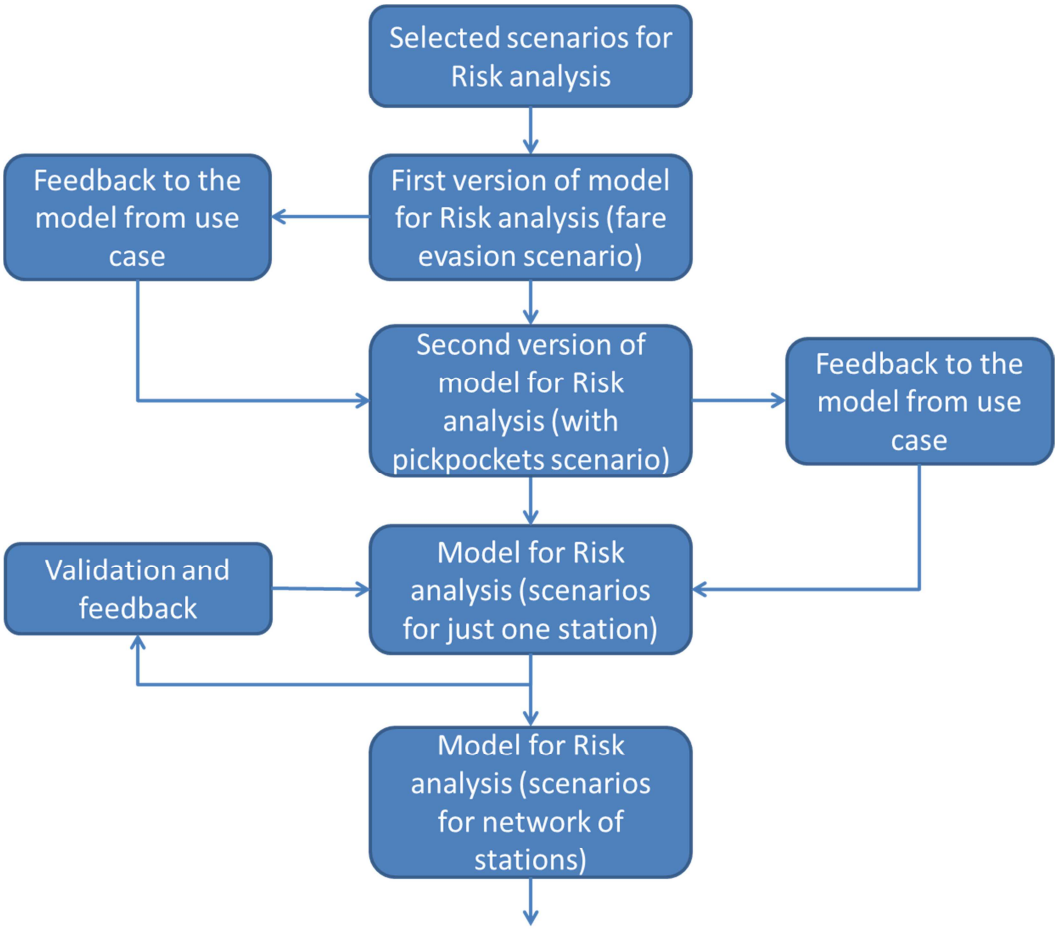

Figure 6: Risk scenarios model building process

As a result, in addition to the refinement of the previous scenarios developed, a new version of the paper was developed by URJC where the following scenarios have been added:

- Pickpocketing threat
- Fare evasion and pickpocketing combined in a single station

Additional information about the scenarios was requested in the form of figures related to both of them, fare evaders and pickpockets.

The model for the risk analysis has been developed based on ARA, as reported in D5.2 [4]. Risk analysis provides a methodology aimed at mitigating the negative effects of threats (e.g., hurricanes, earthquakes, etc.) that may harm the performance of a system.

ARA expands the methodology by focusing on threats coming from intelligent intentional adversaries, e.g., terrorism, counterfeit, etc. ARA is based on a subjective model with the following relevant features:

- The attackers' decisions are treated as random.
- The attackers' preferences and utilities are evaluated through probability distributions.
- The attackers try to maximise its benefits / rewards.

The model has been developed with the following approach:

- First, single threat considering only fare evasion in one station for:
  - Standard evaders
  - Colluders
  - Standard evaders + colluders

  Standard evaders are treated as a standard random process, while Colluders with intentionality, explicitly modelled through ARA.
- Second, it has been extended to a second threat, facing a multi-threat problem: Fare evasion + pickpocketing by an organised group (2-4 members) has been considered attempting thefts over relevant planning period with Impact on security and image, still considering one station.
- Third, the model has been extended to the general multithread and multisite ARA model to include more than one station.

For the fare evasion threat five types of countermeasures have been taken into account:

- Inspectors (preventive/recovery)
- Door (security) guards, usually outsourced (preventive)
- Guards (preventive)
- Automatic access doors (preventive)
- Ticket clerks (preventive)

For the pickpocketing threat four types of countermeasures have been taken into account:

- Patrols (guard + dog). Preventive/recovery.
- Cameras. Preventive.
- Guards (shared with fare evasion). Preventive/recovery.Public awareness plans. Preventive.

The final model produced by URJC was presented in two validation workshops. The validation process is described in Section 4.

The infographics for the risk model are provided below in Figure 7Figure 3 and Figure 8.

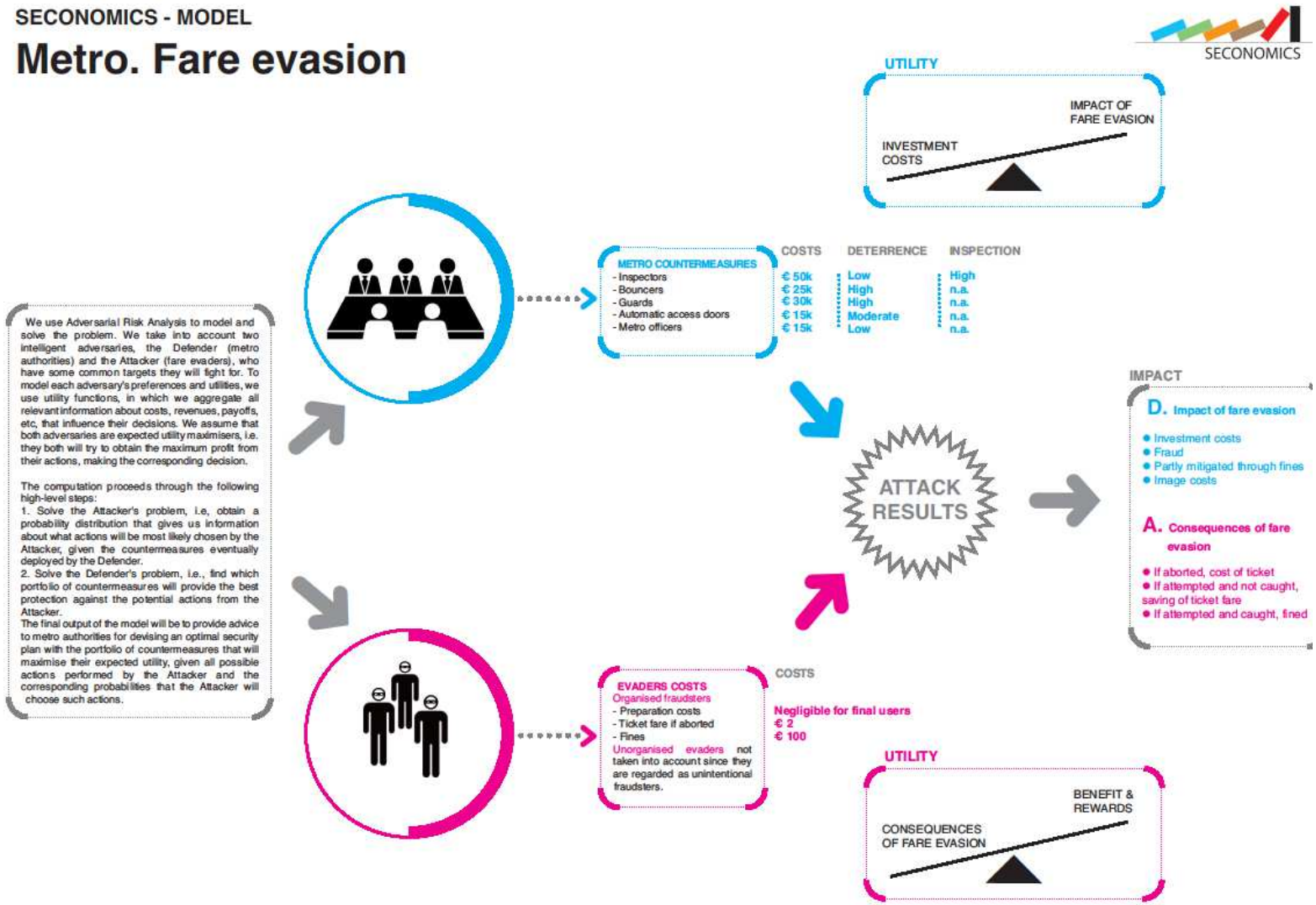

Figure 7: Risk Model - Fraud Model

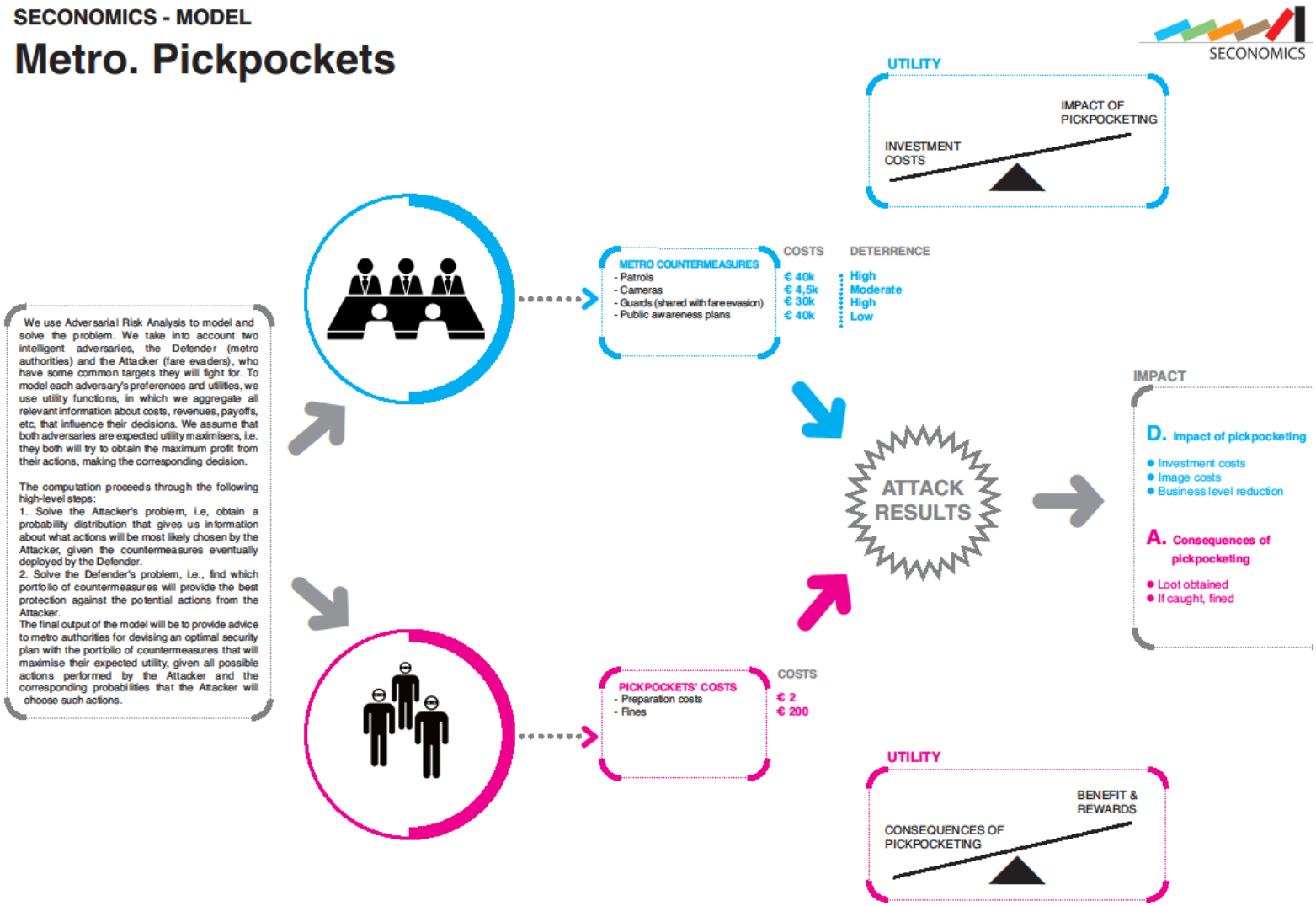

Figure 8: Risk Model - Pickpockets Model

4. Model Validation

4.1 Validation process & Criteria

The validation process is based on two different types of goal oriented activities, validation activities, and activities for promoting the model to similar organizations.

The validation activities are based on the validation plan for Local and Regional Transport Case Study, for Year 2 of the project, as described in D7.1-Validation Plan [5]. The plan for Year 2 is detailed in Table 6.

Table 6: Year 2 validation activities

Model Development & Validation		
M13 – M17	M18 – M21	M22 – M24
Modeling Activities with Consortium Partners (Technical Partners, Domain Experts and End-Users)	Models evaluation. Presentation of first version of models to appropriate stakeholders Refinement – Consortium Partners (Technical Partners, Domain Experts and End-Users)	Final models evaluation and validation. Focus groups with transport Stakeholders and End Users – Direct Observation and Interviews in a Dedicated Workshop

The specific validation activities are based on validation workshops with external experts not working directly in the project. The workshops structure used for the validation is as follows:

- Update of SECONOMICS project progress (goals and current state)
- Urban transport scenarios, analysis and selection
- Validation of security and society model
- Validation of risk analysis model

The model validation activities consist in the following activities:

- Model presentation
- Discussion
- Suggestion collection

The preliminary results from the modelling activities as well as the details of the models were presented. The discussion slot was meant to be used for the application of the model to the specific case scenarios including the discussion on future and emerging threats and pan-European coordination activities. The last part of the workshop was dedicated to the collection of suggestions related to the model applicability.

Additionally, as a formal tool for collecting feedback, a quantitative survey was used to check the usefulness of the model for the stakeholders, addressing questions for the

user acceptability, domain suitability and technical usability of the model. The survey used during the validation workshops can be found at ANNEX 1.

The feedback collected will be considered in the tool-kit development, in order to provide the most suitable solutions for the urban transport domain.

The following validation criteria, shown in Table 7, have been applied for the validation of the models, as a development of the initial validation criteria for public transport described in D7.1 [5]:

Table 7: Urban Transport Validation criteria

TARGET	VALIDATION OBJECTIVES & CRITERIA		
	User Acceptability	**Domain Suitability**	**Technical Usability**
a. Users' decision making	- Improving the process of decision making	- Application to Urban transport context - Domain scoping - Contribution to Pan-European security decision making	
b. Models' structure and computational mechanisms	- Perceived ease of use and perceived usefulness (-> Perceived Efficacy) - Technical and scientific soundness (Reducing complexity, Increasing knowledge, Scalability, Predictability)	- Applicability - Domain scoping	- Understandability (also referred to as Comprehensibility)
d. Models' Output	- Enhancing domain knowledge	- Contribution to enhancing security in relation to future and emerging threats	- Understandability (also referred to as Comprehensibility) - Provision of accurate and probable results. - Impact on task and provision of task relevant output
d. Models' generalization and customization		- Versatile model for application in the domain	

4.2 Validation Activities

Initially, two activities were planned for the evaluation with stakeholders, one within the yearly meeting of the UITP Commission on Security (16th meeting in Hamburg), and second, a workshop with Urban transport related stakeholders. A third activity was later

scheduled at the 17th meeting of the UITP Security Commission that was organized as a collocated event at the IT-TRANS International Conference and Exhibition at Karlsruhe.

Due to the short time allocated for presentation at the 16th UITP meeting there was no opportunity to gather any feedback, so this activity is reported as pure dissemination activity in the next section. The second activity, a one day workshop, was organised on the 19th December 2013 at TMB Barcelona facilities. Attendees were the leaders from the Urban Case study of the SECONOMICS project, leaders of the security and society and from the risk analysis technical work-packages, representatives from the Metro Barcelona and Metro Bilbao security areas and representatives from the transport unit from the regional police (Mossos d'Esquadra). The agenda for the BARCELONA validation workshop can be found at ANNEX 1.

As third activity, a 90 minutes slot was booked at the UITP meeting during the IT-TRANS conference for the presentation of the SECONOMICS project models. A summary of the workshop topics was presented, and the feedback was collected only using the survey mentioned in the previous section. Attendees were members from the UITP Commission on Security, so the representation was mainly consisting on urban transport operators. The agenda with the SECONOMICS validation workshop slot during the UITP meeting at the IT-TRANS conference can be found at ANNEX 1.

4.3 Validation results

Two types of results from the validation activities have been collected: one is the non-structured feedback gathered during the discussions and the other is from the structured feedback collected through the surveys.

Feedback collected from discussions
The feedback gathered from the discussions during the validation workshops for the different topics presented is the following.

For the pickpocket scenarios: The most important security problem is represented by pickpockets. This type of problem represents roughly a 90% of the total incidents detected by the police in urban transport. Most of these people belong to criminal organizations and the same people perform their criminal activities in different European cities, as they are continuously moving from one place to another. Coordination between security bodies from different countries is essential to fight against this phenomenon. Pickpockets have a perfect knowledge of laws and regulations in every place they act, taking advantage of these regulations in their favour. As an example, in Spain they do not use under-age pickpockets, as this is criminally prosecuted. Pickpockets also take advantage of tourists as victims, as they usually do not want to spend their time with complaints.

Fraud scenarios: In the case of Metro Bilbao, fraud is not so important, as the operation of this metro started using the reversible automatic doors that are being currently deployed in the Barcelona Metro network, and which are the source of many security incidents among passengers.

Other scenarios: In the discussions with the police, it was never disclosed their interest in terrorist activities, as this is treated like any other security issue by them, and the reasons to investigate, for example, the video recordings, are never disclosed to TMB security area. This has been reported in report D9.8 [6].

Societal model: One of the biggest issues in this regard is the use of CCTV images, as the citizens are highly sensitive because of personal data protection and the misuse by governments of personal information for other purposes not related with the security in public transport.

Risk model: Mobility of fraudsters to avoid being caught is quite limited. They usually try another access to the Metro station or move to the next station to avoid security controls.

Pan-European coordination: There are 3 different types of coordination for law enforcement agencies at European level, Interpol, Schengen Information System and Europol, all of them with its corresponding goals and resources. One of the main concerns is pickpockets, as most of them act taking advantage of the free movement of people inside the Schengen area, so this has become a transnational issue. To fight against it the security dimension has to be reinforced, as well as harmonizing the laws to deactivate the advantage that these groups take from local regulations. The coordination between law enforcement agencies is essential to provide an adequate response to this phenomenon and to fight against the advantage provided by the free movement of individuals.
A similar scenario is found currently with graffiti painters. Some initiatives are being undertaken by railway and urban transport organizations to mitigate this phenomenon. More detailed information is provided about Pan-European coordination in Section 6.

Feedback collected from surveys
A total of 13 surveys replies were collected during the validation workshops. The conclusions of the surveys preformed during the validation activities are summarized below. The results of the surveys can be found in ANNEX 1, with the total number of answers by criterion and answer type.

Societal model:
Perceived efficacy (User Acceptability)
Respondents mostly agreed that the model enabled them to understand the societal and individual determination of risk and danger perception, the acceptance of different forms of asocial behaviour, potential security threats changes in time, and in general the efficacy of the model presented. There are disparity of opinions on the direct connection between security measures and passengers' feeling of safety.

Technical and scientific soundness (User Acceptability)
Respondents relatively agreed about the technical and scientific soundness of the model:

- Reducing complexity: The model reduces ambiguity and enables better understanding of the existing situation (62% agree; 23% neutral)

- Increasing knowledge: The model enhances knowledge in this field (69% agree; 23% neutral)
- Scalability: The model is versatile and suitable for application within this domain (69% 23% neutral)
- Predictability: The model has the capacity to provide accurate and probable results (46% agree; 54% neutral)

Between 100% and 80% of the respondents agreed on the importance of these criterions.

Applicability (Domain Suitability)
The answers about the applicability of the model to the urban transport context for security requirements were rather neutral with a positive trend. This is considered the most important criterion of the suitability domain.

Domain scoping (Domain Suitability)
The majority of the respondents (77%) agreed in the model having the appropriate scope for the urban transport domain.

Comprehensibility (Technical Usability)
66% of the respondents considered that the model covers the majority of the necessary concepts of the application domain.

Risk model:
Perceived efficacy (User Acceptability)
Respondents relatively agreed that the model have the potential to:

- improve the process of decision making (92% agree)
- be utilized in public transport domain (77% agree)
- provide task relevant output (54% agree)
- impact the task, when applied (69% agree)

while the rest of the answers were neutral.
Respondents also agreed that there are conditions that would facilitate the usage of the model. While only 38% agreed that the model could contribute to a closer Pan-European security decision making, the rest of answers were neutral on that topic.
Most of the respondents agreed that the model has the potential to contribute to the enhancement of security in relation to future and emerging threats.

Technical and scientific soundness (User Acceptability)
Respondents relatively agreed to the technical and scientific soundness of the model:

- Reducing complexity: The model reduces ambiguity and enables better understanding of the existing situation (61% agree; 31% neutral)
- Increasing knowledge: The model enhances knowledge in this field (92% agree; 8% neutral)
- Scalability: The model is versatile and suitable for application within this domain (62% agree 38% neutral)
- Predictability: The model has the capacity to provide accurate and probable results (54% agree; 46% neutral)

The most important criterion for respondents was the scalability of the model (100%) and the less important was the reduction of complexity (54%).

Applicability (Domain Suitability)
The answers were quite positive (77%) about the applicability of the model to the urban transport context being able to cover functional and security requirements, while the other answers were neutral. This is considered the most important criterion of the suitability domain.

Domain scoping (Domain Suitability)
The majority of the respondents (66%) agreed in the model having an appropriate scope for the urban transport domain.

Comprehensibility (Technical Usability)
62% of the respondents agreed in the model covering the majority of the necessary concepts of the application domain.

4.4 Additional Dissemination Activities

The activities to introduce the model to similar organizations were based on the stakeholders' engagement activities plan for Year 2, as described in D3.3-Urban public transport requirements final version. The plan for Year 2 is detailed in Table 8.

Table 8: Year 2 stakeholders' engagement activities plan

Model Development & Validation	
M18 – M21	M22 – M24
Presentation of first version of models to selected stakeholders	Presentation of final version of models to selected stakeholders

The specific activities are presentations of the different models elaborated from the scenarios behind them, the specific model descriptions, and the results obtained using the models up to date.

The following activities were performed to disseminate and introduce the models to similar organizations.

A SECONOMICS presentation on the project goals, the transport use case, and the scenarios analysed was performed at the "Rail BCN" international fair on railway industry hosted in Barcelona between 19th and 21st November 2013. It was performed during the professional conferences named "Rail BCN INNOVA" (http://www.bcnrail.com/en/innova) on the 19th November. This was a space to introduce news, innovation, best practices and large class innovative projects in the railway industry. The presentation was given by TMB representatives.

The presentation to the UITP Commission on Security was held in Hamburg on the 21st and 22nd November 2013, by TMB representatives. The initial goal of this meeting was to perform the following activities:

- Update of SECONOMICS project progress on the Urban transport case
- High-level presentation of models development so far
- Feedback

However, due to the limited time allocated to this activity, it was only possible to perform the presentation of the model development so far, and collect some informal feedback from attendees. Additional information on initiatives to tackle security issues on urban transport was collected during the UITP meeting, specifically on current initiatives for fighting metal theft, graffiti and vandalism that are being carried by some groups in the sphere of railway transport and urban transport. This information is reported in Sections 5 and 6.

Further information about the dissemination activities can be found in ANNEX 2 Additional information from dissemination activities.

5. Future and emerging threats

The impact of future and emerging threats can be assessed in the confluence of factors for some of the fraud scenarios, the civil disobedience promoting not to pay (using internet social platforms), and the promotion of producing fake tickets (based on information available in the internet). For these scenarios, the rise of fares above the rise of general prices is causing a large displeasure among users of public transport and a formal claim by users' associations, as it has happened since the start of the economic crisis in the last years.

This displeasure provides the motivation to the groups that promote fraud as a form of protest. The links between the formal user's associations and the groups that promote fraud could be reinforced in the future. The impact of fare increase plus the support of new technologies and new ways of committing fraud might be difficult to manage by the transport authorities. During the recent years, the combination of these factors has been observed not only in Barcelona but also in other large cities like Madrid.

The impact of fare increase is something taken into account by the societal model, specifically in how the critical salience index is influenced by this type of factors. Nevertheless, as it is stated in the societal model, the fare evasion is more tolerated since the beginning of the economic crisis as it fully affects customers.

In the case of risk model, if some type of new form of fare evasion is adopted by fraudsters, the model will simply not take it into account as it is. However, the model could be extended as soon as new ways of defence against these types of "attacks" are developed and considered into the model, including the countermeasures prepared and deployed by the transport operator.

Besides the models produced for the transport use case, there is a clear concern on the graffiti and vandalism threat as it is transforming from a regional or national problem to a transnational problem in which transport operators are affected by international crime organised networks that travel around Europe to "express their art". Graffiti is a

growing trend in the transport sector that needs to be addressed since it creates big operational, financial and reputation losses.
The risk model can be extended to other type of security scenarios, such as graffiti, where the specific threats and countermeasures for this type of incidents should be modelled according to the knowledge gained by the transport operator.

Metal theft is another emerging threat that is affecting railway transport in general and urban transport in particular. Metal theft is a serious problem for railway networks as thieves target signalling cables, overhead power lines and even metal fences to be sold as scrap. As railway networks are designed to fail safe, this means that when a cable is cut, trains are brought to a stop, leading to a service disruption until the problem is fixed. The criminal networks behind these thefts are transnational, as the stolen metal is often transported across several borders and sold as scrap for recycling far away from the actual scene of the crime. This type of threats could fit in the risk model using the ARA methodology for analysing the most effective countermeasures and the amount of resources to be dedicated.

6. Pan-European coordination

As regards to Pan-European coordination for security threats, some initiatives exist at European level closely related with the security scenarios considered for the model development. As reported in Table 3 of Section 2.2, the scenarios selected have a strong relation with transnational criminal organizations. To fight such phenomena, one of the most important and essential requirements is the coordination between law enforcement agencies, as it was reported by the police representatives during the Barcelona validation workshop. To summarize, the current coordination initiatives among law enforcement agencies in Europe are the following:

Interpol: Not restricted to the European scope, but widely used by police in Europe. It basically facilitates international police cooperation, by providing information request services among police bodies for investigation purposes. This is essential to facilitate investigation on criminal organizations that operate transnationally and beyond the EU borders. [7]

Schengen Information System (SIS): This system, managed by the Home Affairs DG of the European Union, is the largest information system for public security in Europe, and is an intergovernmental initiative under the Schengen Convention. This system holds information and alerts on individuals, as well as information on items such as motor vehicles, firearms, identity documents and others. The information is entered into the system by national authorities and forwarded via the Central System to all Schengen States. The uses of this system are for national security, border control and law enforcement purposes. [8]

Europol: It is the European Union's law enforcement agency whose main goal is to help achieve a safer Europe for the benefit of all EU citizens. Europol is a hub for criminal information and a centre for law enforcement expertise. The agency has a large

analytical capability providing strategic and forward-looking analysis of crime and terrorism in the European Union. [9]

In the case of criminal activities supported by criminal organizations, one of the biggest concerns as of today are pickpockets, with offenders that act in different cities, moving from one to another with complete ease. These criminal organizations take advantage of different system weaknesses, like:

- Free movement of individuals in the Schengen Area
- Different laws in every country, where criminals have a perfect knowledge of them and move to the places where the execution of their activities is more favourable.
- The lack of society awareness of the problems caused by these criminal organizations

It is required a harmonization of laws at European level to counter these organizations in order to deactivate the advantage they take from specific local or national regulations. And last but not least, the society must be aware of the problems to make politicians react, and act to align the legal framework to the reality to stop criminals acting with total impunity.
Solutions must focus on the victims and on facilitating and evaluating the impact of crime on victims (often targeting tourists, elderly and vulnerable citizens in the case of pickpockets). The penalties must be related to this impact, not only on the value of the stolen, but on the discomfort caused to the victims, with a proper evaluation of the intangible damages caused. In this way higher penalty can be achieved, suitable to the actual harm caused to society.

Based on an initiative and invitation from Munich Police in Germany, Europol hosted and supported an international pickpocketing conference from 13 to 15 May 2013 at its headquarters in The Hague. The aim was to strengthen international collaboration to fight against this highly-organised criminal phenomenon. A follow-up meeting is planned for autumn 2014 [10].

A similar situation with pickpockets is usually found with graffiti painters. As detailed in D3.3 [2], they usually show their achievements on internet. Similarily with pickpockets, a lack of harmonisation in the regulation for graffiti's punishment is an advantage for this type of criminals. For example, in Spain graffiti is not a crime, it is only a fault, so it encourages graffiti painters to perform their activities. Often, damages caused to get access to the facilities where the trains are parked are criminal faults and graffiti painters can be punished for this, but that is not the case for the painting itself. Catalonia Regional Police is coordinated with other law enforcement agencies in order to exchange information on graffiti painters.
An effort has to be made in this regard, exchanging best practices and taking relevant EU actions in order to unite the efforts of all stakeholders into a common goal, the mitigation of these activities.
Within that context, an EU research project named Graffolution, funded by DG MOVE and starting at the beginning of 2014, will contribute to fight against graffiti vandalism. The project will focus on smart awareness through an innovative web based platform

offering prevention solutions to the stakeholders groups. The UITP will be a member of the project user group.

7. Conclusions

The WP3 validation process has allowed the evaluation of the selected scenarios, the modelling approach and the models themselves by using a customized process. The application of a tailored methodology during the modelling and validation phases allowed the collection of valuable feedback through pre-defined evaluation criteria.

The collected feedback through the workshops participation has indicated that the approach and the models are well aligned with the urban transport requirements in terms of security scenarios and applicability. About the social model, it was verified the positive impact of security human resources on customer satisfaction and the not so evident impact of the application of technical resources and new technologies on the security scenarios. About the risk model, it can be adapted to additional scenarios, evaluating the specific countermeasures required by each security threat added to the model.

Regarding the future and emerging threats it has been shown that models can support them, as the models are well aligned with the security scenarios reported in D3.3 which take into account these types of threats like Graffiti and metal theft mostly performed by transnational organized groups.
As for the Pan-European coordination initiatives, most of them are dealing with the security scenarios supported through the SECONOMICS models for urban transport.

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ANNEX 1 Additional information from validation activities

Agenda for the validation workshop at Barcelona

Taller sobre modelos socio-económicos de seguridad en el transporte público

Jueves, 19 de Diciembre de 2013 (9:30-16:30)

Sala de reuniones CCM (2ª planta), Carrer Josep Estivill, 47, 08027 Barcelona. (Metro L1, L5, L10 y L11 Sagrera).

Invitación

El proyecto SECONOMICS presentará los modelos socio-económicos en un taller que tendrá lugar el próximo jueves 19 de Diciembre en Barcelona.

El programa consiste en una serie de presentaciones por parte de miembros del proyecto y discusiones en grupo. Adicionalmente a la presentación de los modelos, se mantendrán discusiones y se pedirá la opinión de los expertos sobre dichos modelos.

Registro

Para asistir al taller rogamos confirme su asistencia enviando un correo a Ricard Munné (ricard.munne@atos.net)

Programa

9:30	Llegada y registro
10:00	Bienvenida y objetivos del taller Presentación del proyecto (objetivos y estado actual)
10:20	Escenarios de transporte urbano analizados Escenarios seleccionados para el desarrollo de los modelos
11:00	Descanso
11:30	Validación de los modelos seguridad y sociedad • Presentación de los modelos • Discusión • Recogida de sugerencias
13:00	Comida
14:30	Validación de los modelos de análisis de riesgos • Presentación de los modelos • Discusión • Recogida de sugerencias
16:00	Resumen y conclusiones

Este taller ha sido organizado por el proyecto SECONOMICS, con fondos del Séptimo Programa Marco. Los contenidos presentados en este evento no reflejan necesariamente la opinión de la Comisión Europea.

Agenda with SECONOMICS validation workshop during the UITP meeting at the IT-TRANS conference

UITP ADVANCING PUBLIC TRANSPORT

UITP Security Commission

17th Meeting – Karlsruhe

16-17 February 2014

Agenda

Sunday 16 February

17:00	Pick up at hotel – Technical Visit
19:00	Welcome dinner, Hasen Hotel - all welcome

Monday 17 February

08 :30	Pick up at hotel, transfer to VBK
	Closed session – Members/Corresponding Members only
09:00	1. **SecCom Working Methods** 2. **SecCom Terms of Reference**

	Open session – All Welcome
10:00	Coffee break
10:30	1. **Administration** • Welcome by Chairman • Approval of minutes of 16th SecCom meeting, Hamburg • Membership update
10:45	2. **Presentation from Local Host, VBK**
11:15	3. **News from Members** • Incidents, issues, questions • Introductions from new members - Raymond Diaz, MTA New York City Transit
12:00	4. **SecCom Working Programme & Reports from Working Groups** • Overview of Working Groups • Matrix of Threats WG (Denis)
12:30	Lunch
13:30	4. **SecCom Working Programme & Reports from Working Groups (cont.d)** • Training WG • Graffiti WG • Security of Buses WG (Jan & André) • Milan World Congress WG • Metal Theft (José Pires, UIC) • Regional WGs - EU WG • SECUR-ED (Yves Perreal)
15:30	Coffee Break

UITP SECURITY

VBK Bewegt alle.

UITP Security Commission

17th Meeting – Karlsruhe

16-17 February 2014

Agenda

16:00	**5. Dissemination/Communication/events** • Next SecCom meetings • PTSpotlights • PTI Column • Newsletter • MyUITP • IT-TRANS
17:00	**SECONOMICS SESSION**
18:30	Close of meeting

19 :30	Official Dinner Renaissance Hotel

Welcome Dinner	**Meeting Venue**
Hasen Hotel Gerwigstrasse, 47 76131 Karlsruhe www.hotel-hasen.de	**VBK Verkehrsbetriebe Karlsruhe GmbH** Tullastrasse 71 76131 Karlsruhe
Accommodation/Official Dinner	
Renaissance Hotel Mendelsohnplatz 1 76131 Karlsruhe	

UITP SECURITY

VBK Bewegt alle.

Model of survey form used at the validation workshops

Evaluation Questionnaire for the SECONOMICS Models presented

Instructions for using this questionnaire (please read carefully):

1) There are two sets of questions (2 pages each). One for each model; Societal and Risk
2) Before starting filling the questionnaire, please read through the questions to get a rough overview about the criteria.
3) Please do not hesitate to ask for explanation if any question is not fully clear.
4) The questionnaire has two scales for each criterion (statement): Please indicate for each criterion on the left scale whether the criterion is fulfilled. And indicate on the right scale how important this criterion is to you in general.
5) You can fill in the questionnaire at any time after the presentation of the models.
6) After completing the questionnaire, please deliver the paper or scan it and send it to: mpellot@tmb.cat or ricard.munne@atos.net

Thank you!

1

A. Societal models

USER ACCEPTABILITY					
PERCEIVED EFFICACY (Perceived ease of use and perceived usefulness)	**How much do you agree or disagree with the sentence?**				
The presentation enabled me to understand:	Strongly agree	Rather agree	Neither agree nor disagree	Rather disagree	Strongly disagree
The societal and individual determination of risk and danger perception.	☐	☐	☐	☐	☐
There is not direct connection between security measures and passengers' (subjective) feeling of safety.	☐	☐	☐	☐	☐
Acceptance of different forms of asocial behaviour and potential security threats changes in time.	☐	☐	☐	☐	☐
New security measures can significantly affect passengers' attitudes and acceptance of different forms of asocial behaviour and potential security threats.	☐	☐	☐	☐	☐
Communication of new security measures to passengers.	☐	☐	☐	☐	☐

	Is the criterion fulfilled?					**How important is the criterion to you?**	
	Strongly agree	Rather agree	neither agree nor disagree	Rather disagree	Strongly disagree	Important	Not important
Reducing complexity: The model reduces ambiguity and enables me to understand the existing situation better.	☐	☐	☐	☐	☐	☐	☐
Increasing knowledge: The model enhances my knowledge in this field.	☐	☐	☐	☐	☐	☐	☐
Scalability: The model is versatile and suitable for application within this domain.	☐	☐	☐	☐	☐	☐	☐
Predictability: The model has the capacity to provide accurate and probable results. .	☐	☐	☐	☐	☐	☐	☐

2

A. Societal models

DOMAIN SUITABILITY							
	Is the criterion fulfilled?					How important is the criterion to you?	
	Strongly agree	Rather agree	neither agree nor disagree	Rather disagree	Strongly disagree	Important	Not important
Applicability							
The models can be applied on the urban transport context for modelling functional and security requirements. .	☐	☐	☐	☐	☐	☐	☐
Domain scoping							
The model has an appropriate scope for the urban transport domain. It is neither too broad, , nor too narrow.	☐	☐	☐	☐	☐	☐	☐
TECHNICAL USABILITY							
Comprehensibility							
The model covers majority of all necessary concepts of the application domain.	☐	☐	☐	☐	☐	☐	☐

When you **rather or strongly disagreed** with the fulfilment of criteria, what were the reasons?
Please make a **list of problem issues** for the model

3

B. Risk models

USER ACCEPTABILITY								
PERCEIVED EFFICACY (Perceived ease of use and perceived usefulness)	**How much do you agree or disagree with the following sentence?**							
I think the model has the potential to:	Strongly agree	Rather agree	Neither agree nor disagree	Rather disagree	Strongly disagree			
• improve the process of decision making.	☐	☐	☐	☐	☐			
• be utilized in public transport domain.	☐	☐	☐	☐	☐			
• provide task relevant output.	☐	☐	☐	☐	☐			
• impact on the task, when applied.	☐	☐	☐	☐	☐			
I think that there are conditions that would facilitate the usage of the model.	☐	☐	☐	☐	☐			
The model could contribute to a closer Pan-European security decision-making	☐	☐	☐	☐	☐			
The model has the potential to contribute to enhancement of security in relation to future and emerging threats.	☐	☐	☐	☐	☐			
	Is the criterion fulfilled?					**How important is the criterion to you?**		
	Strongly agree	Rather agree	Neither agree nor disagree	Rather disagree	Strongly disagree	Important	Somewhat important	Not important
TECHNICAL AND SCIENTIFIC SOUNDNESS								
Reducing complexity: The model reduces ambiguity and enables me to understand the existing situation better.	☐	☐	☐	☐	☐	☐	☐	☐
Increasing knowledge: The model enhances my knowledge in this field.	☐	☐	☐	☐	☐	☐	☐	☐
Scalability: The model is versatile and suitable for application within this domain.	☐	☐	☐	☐	☐	☐	☐	☐
Predictability: The model has the capacity to provide accurate and probable results. .	☐	☐	☐	☐	☐	☐	☐	☐

4

B. Risk models

DOMAIN SUITABILITY								
	Is the criterion fulfilled?					How important is the criterion to you?		
	Strongly agree	Rather agree	Difficult to say	Rather disagree	Strongly disagree	Very important	Somewhat important	Not important
Applicability								
The models can be applied on the urban transport context for modelling functional and security requirements. .	☐	☐	☐	☐	☐	☐	☐	☐
Domain scoping								
The model has an appropriate scope for the urban transport domain. It is neither too broad, , nor too narrow.	☐	☐	☐	☐	☐	☐	☐	☐
TECHNICAL USABILITY								
Comprehensibility								
The model covers majority of all necessary concepts of the application domain.	☐	☐	☐	☐	☐	☐	☐	☐

When you **rather or strongly disagreed** with the fulfilment of criteria, what were the reasons?
Please make a **list of problem issues** for the model

5

A. Societal models

USER ACCEPTABILITY										
PERCEIVED EFFICACY (Perceived ease of use and perceived usefulness)						**How much do you agree or disagree with the sentence?**				
The presentation enabled me to understand:						Strongly agree	Rather agree	Neither agree nor disagree	Rather disagree	Strongly disagree
The societal and individual determination of risk and danger perception.						-	8	2	-	-
There is not direct connection between security measures and passengers' (subjective) feeling of safety.						1	2	2	3	2
Acceptance of different forms of asocial behaviour and potential security threats changes in time.						1	8	1	-	-
New security measures can significantly affect passengers' attitudes and acceptance of different forms of asocial behaviour and potential security threats.						4	4	1	-	1
Communication of new security measures to passengers.						2	6	2	-	-
	Is the criterion fulfilled?					**How important is the criterion to you?**				
	Strongly agree	Rather agree	neither agree nor disagree	Rather disagree	Strongly disagree	Important				Not important
TECHNICAL AND SCIENTIFIC SOUNDNESS										
Reducing complexity: The model reduces ambiguity and enables me to understand the existing situation better.	2	6	3	2	-	10				1
Increasing knowledge: The model enhances my knowledge in this field.	2	7	3	-	1	11				-
Scalability: The model is versatile and suitable for application within this domain.	3	6	3	1	-	9				2
Predictability: The model has the capacity to provide accurate and probable results. .	2	4	7	-	-	10				1

2

A. Societal models

DOMAIN SUITABILITY							
	Is the criterion fulfilled?					How important is the criterion to you?	
	Strongly agree	Rather agree	neither agree nor disagree	Rather disagree	Strongly disagree	Important	Not important
Applicability							
The models can be applied on the urban transport context for modelling functional and security requirements.	3	4	6	-	-	12	-
Domain scoping							
The model has an appropriate scope for the urban transport domain. It is neither too broad, , nor too narrow.	2	8	3	-	-	10	1
TECHNICAL USABILITY							
Comprehensibility							
The model covers majority of all necessary concepts of the application domain.	1	7	4	1	-	8	3

When you **rather or strongly disagreed** with the fulfilment of criteria, what were the reasons?
Please make a **list of problem issues** for the model

It would need to be supplemented with more information sources

3

B. Risk models

USER ACCEPTABILITY								
PERCEIVED EFFICACY (Perceived ease of use and perceived usefulness)	**How much do you agree or disagree with the following sentence?**							
I think the model has the potential to:	Strongly agree	Rather agree	Neither agree nor disagree	Rather disagree	Strongly disagree			
• improve the process of decision making.	2	10	1	-	-			
• be utilized in public transport domain.	3	7	3	-	-			
• provide task relevant output.	4	3	6	-	-			
• impact on the task, when applied.	3	6	4	-	-			
I think that there are conditions that would facilitate the usage of the model.	2	9	1	1	-			
The model could contribute to a closer Pan-European security decision-making	3	2	8	-	-			
The model has the potential to contribute to enhancement of security in relation to future and emerging threats.	2	6	5	-	-			
	Is the criterion fulfilled?					**How important is the criterion to you?**		
	Strongly agree	Rather agree	Neither ıgree nor disagree	Rather disagree	Strongly disagree	Important	Somewhat important	Not important
TECHNICAL AND SCIENTIFIC SOUNDNESS								
Reducing complexity: The model reduces ambiguity and enables me to understand the existing situation better.	1	7	4	1	-	6	5	-
Increasing knowledge: The model enhances my knowledge in this field.	3	9	1	-	-	7	4	-
Scalability: The model is versatile and suitable for application within this domain.	3	5	5	-	-	11	-	-
Predictability: The model has the capacity to provide accurate and probable results.	2	5	6	-	-	7	3	1

4

B. Risk models

DOMAIN SUITABILITY								
	Is the criterion fulfilled?					How important is the criterion to you?		
	Strongly agree	Rather agree	Difficult to say	Rather disagree	Strongly disagree	Very important	Somewhat important	Not important
Applicability								
The models can be applied on the urban transport context for modelling functional and security requirements. .	4	6	3	-	-	9	1	-
Domain scoping								
The model has an appropriate scope for the urban transport domain. It is neither too broad, , nor too narrow.	3	6	4	-	-	7	1	1
TECHNICAL USABILITY								
Comprehensibility								
The model covers majority of all necessary concepts of the application domain.	2	6	5	-	-	7	3	-

When you **rather or strongly disagreed** with the fulfilment of criteria, what were the reasons?
Please make a **list of problem issues** for the model

The model allows to adapt to future threats, contexts and phenomena. Still, Fraud, Pickpocketing, graffiti and antisocial behavior have been initially covered by the model.

5

ANNEX 2 Additional information from dissemination activities

Agenda with SECONOMICS slot on 19th Nov. 2013 at the BcnRail INNOVA conference

PROGRAMA

19 de Noviembre

Área: Competitividad

11.00h-11.20h **NGTC. Next Generation of Train Control**
Vicenç Rius Moreno, *Project Manager de Líneas Automáticas, TMB*

11.30h-11.50h **RESTRAIL. Reducción de suicidios e invasiones a vía en el entorno ferroviario**
Juan José Plaza Vaquero, *Responsable de proyecto y experto en Psicología del Transporte, CIDAUT*

12.00h-12.20h **SUSTRAIL. The sustainable freight railway: Designing the freight vehicle – track system for higher delivered tonnage with improved availability at reduced cost**
Juan de Dios Sanz Bobi, *Coordinador del Proyecto, CITEF, Universidad Politécnica de Madrid*

12.30h-12.50h **SECONOMICS. Socio-Economics meets Security**
Michael Pellot, *Director de Investigación y Desarrollo, TMB*

13.00h-13.20h **Aplicación automatizada de adhesivos para utilización de los nuevos materiales ligeros**
Joaquim Rojas, *Key Account, Grupo Promaut*

20 de Noviembre

Área: Eficiencia Energética y Sostenibilidad

11.00h-11.20h **Optimización de sistemas de aislamiento ferroviario basados en caucho reciclado**
Joan Peset Iribarren, *Jefe del Departamento de Gestión del Conocimiento e Innovación Tecnológica, COMSA*

11.30h-11.50h **SEAM4US. Sustainable Energy Management for Underground Stations**
Michael Pellot, *Director de Investigación y Desarrollo, TMB*

12.00h-12.20h **Impacto ambiental de la nueva generación de trenes Talgo**
Lara Giménez Moreno, *Ingeniero de I+D+i, Talgo*

12.30h-12.50h **FERROSMARTGRID. Desarrollo de la primera red inteligente para la gestión energética del sector ferroviario**
Enrique García Moreno, *Técnico de la Subdirección de Innovación y Desarrollo Tecnológico, ADIF*

13.00h-13.20h **MERLIN. Sustainable and intelligent management of energy for smarter railway systems in Europe: an integrated optimization approach**
Ignacio González, *Jefe de Proyecto, Fundación de los Ferrocarriles Españoles*

13.30h-13.50h **Aplicación del gas natural licuado a la tracción ferroviaria**
Marta Sánchez Borràs, *Gerente del Área de Territorio, Infraestructuras y Movilidad, Institut Cerdà*

21 de Noviembre

Área: Superestructura e Infraestructura

11.00h-11.20h **Sistemas de cambio de ancho automático para mercancías**
Sergio López Lara, *Director General, TRIA Railway R&D*

11.30h-11.50h **OVER RAIL**
Teresa Real Herraiz, *Investigadora, Universidad Politécnica de Valencia*

12.00h-12.20h **HD BALLAST**
Teresa Real Herraiz, *Investigadora, Universidad Politécnica de Valencia*

12.30h-12.50h **Nuevas soluciones para el dimensionamiento eléctrico de la tracción ferroviaria**
Javier Sanz Feito, *Catedrático de Ingeniería Eléctrica de la Universidad Carlos III,Cátedra ELECTREN* y Felipe Moya García, *Director Área Subestaciones, ELECTREN*

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ANNEX 3 Attendees to the validation workshops (confidential)

List of attendants to the validation workshop at Barcelona

SECONOMICS

Second Public Transport Case Study Workshop
(19 December 2013, Barcelona)

#	Name	Company Organization	19 Dec. 2013 10:00-17:00	Signature
1	Mónica Luis Godó	Mossos d'escuadra	X	
2	Carles Vallés	Mossos d'escuadra	X	
3	David Deirós	Mossos d'escuadra	X	
4	Eduardo Hernández Ladesma	Metro Bilbao	X	
5	Petra Guasti	IS ASCR	X	
6	Zdenka Mansfeldová	IS ASCR	X	
7	Javier Cano	URJC	X	
8	Ricard Munné	ATOS	X	
9	Ricardo Ortega	TMB	X	
10	Daniel Villegas	TMB	X	
11	Michael Pellot	TMB	X	
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List of attendants to the validation workshop during the UITP meeting at the IT-TRANS conference

UITP Security Commission

17th Meeting – Karlsruhe

16-17 February 2014

List of participants

CHAIRMAN			
Thomas	KRITZER	WIENER LINIEN GMBH & CO KG	Austria
VICE-CHAIRMEN			
Rainer	COHRS	MÜNCHNER VERKEHRSGESELLSCHAFT	Germany
Ricardo	ORTEGA	FERROCARRIL METROPOLITA DE BARCELONA	Spain
LOCAL HOST			
Olaf	STROTKÖTTER	VERKEHRSBETRIEBE KARLSRUHE GMBH	Germany
MEMBERS			
Ali	ABDOLLAHPOUR	TEHRAN URBAN & SUBURBAN RAILWAY CO	Iran
Kevin	CLACK	LONDON UNDERGROUND LTD	UK
Antonin	FEDORKO	DOPRAVNI PODNIK HLM PRAHA AS	Czech Republic
Jiri	SUBRT	DOPRAVNI PODNIK HLM PRAHA AS	Czech Republic
Arndt	MALYSKA	HAMBURGER HOCHBAHN AG	Germany
Hans Martin	RUDOLPH	HAMBURGER HOCHBAHN-WACHE GMBH	Germany
Eduardo	HERNANDEZ LEDESMA	METRO BILBAO SA	Spain
Robin	FORREST	SNCF	France
Norihito	KUROYANAGI	EAST JAPAN RAILWAY COMPANY (FRANCE)	France
André	MEIER	VERKEHRSBETRIEBE ZÜRICH (VBZ)	Switzerland
Evelyne	PARELLO	STIB	Belgium
Jan	POLITIEK	ARRIVA/DB	Netherlands
Nevine	TADROS	SOCIETE DE TRANSPORT DE MONTREAL	Canada
Antonio	VALENTE	METRO - LISBON	Portugal
GUESTS & OBSERVERS			
Paul	GWYNN	INIT GMBH, CHAIR OF UITP ITSI COMMITTEE	Germany
Michael	PELLOT GARCIA	TRANSPORTS METROPOLITANS DE BARCELONA	Spain
Emmanuèle	BELOEIL	COLPOFER	France
José	PIRES	UIC	France
UITP			
Lindsey	MANCINI	UITP	Belgium
Natacha	WHITE	UITP	Belgium