



‘Security of mass transportation’ Demonstration programme

On March the 18th in Berlin, the German Ministry of Education and Research (BMBF) organised in cooperation with the European Commission a workshop on the Demonstration Programme on ‘Security of Mass Transportation’. The goal of this workshop was to bring inputs from the stakeholders in order to help finalise the work programme text for the implementation of the second phase of the demonstration programme on the Security of Mass Transportation.

SEREN, the network of Security research NCPs, attended this workshop and proposes here an interpretation of the debates and issues at stake on this specific topic that will be at the heart of the SEC-2010-1 call for proposals.

1. Context

In its 2006 [report](#), the European Security Research Advisory Board recommended to drive Security research through three technical research paths:

- . Research path 1 – capability development targeted on multi-mission or mission-specific technology development. In FP7, this research path is implemented through the EC financial support to capability projects.
- . Research path 2 – system development aiming at integrating a number of capabilities, technologies and disciplines. This research path is implemented through the funding of integration projects.
- . Research path 3 – systems of systems demonstration whose goal would be to integrate a number of systems. This research path will be implemented through the launch of Demonstration programmes (DP).

ESRAB identified a total number of 5 demonstration programmes to be launched during the 7 years period of FP7. Those DP will serve as flagships for the European Security Research Programme and hopefully will act as sound proofs of the importance and added-value that such a novel programme can bring to EU citizens security. In order to prepare such ambitious programmes ESRAB recommended a two steps approach that latter was followed by DG Enterprise from the SEC-2007-1 call onward.

Indeed, among those five programmes “Security of mass transportation” was identified and [DEMASST](#) project (Demo for mass transportation security: roadmapping study) was funded through the SEC-2007-1 call for proposals in order to prepare the roadmap towards the second phase of the demonstration programme. However, because of various delays, among which one related to the sensitivity issues of such a topic, DEMASST could only be launched in 2009 but yet was able to present a [first set of ideas](#) during the workshop.

In order to prepare this workshop and initiate a larger scale debate, the European Commission drafted in January a non paper synthesising the first reflexions on the scope and rationale of such a demonstration programme (see Annex 1). In this respect, this non paper clarified some elements, amongst which the position of this DP in regards to other initiatives such as the DP on freight ‘Logistic and supply chain security’ or the integration

Work Package 4 – Policy monitoring



Policy paper n°2

Frédéric Laurent, 25/03/2009

project on Airport security. Moreover, it proposed to focus the programme on public urban transport security with an emphasis on critical neuralgic nodes and through cross system/modular approach. Therefore, the DP should focus on the security of metro, tram, short distance regional rail transport, city busses, inter-modal neuralgic nodes and their respective relevant infrastructures such as stations and their inter functional areas, IT systems, tunnels, bridges...

One of the polemic propositions contained in this draft EC non paper was that this DP should organise virtual testing of systems within the virtual city of 'Europolis'.

This non paper also helped clarify discussions on the scope and technical content:

"The scope and technical content of this full demonstration programme (phase 2) will be the demonstration of a consistent and integrated set of mass transportation security systems to secure transport networks, nodes and platforms, taking into account the specific requirements for each sector/mode and the particular European-wide dimension of urban public transport."

2. Rationale

As it was highlighted by many speakers during the workshop, 80% of EU citizens now live in cities. Public transport in cities is a major mode for daily commuting and therefore ever increasing masses of people make use of the transport networks. As a reference, London and Paris public transport networks jointly deliver transportation services to 20 million passengers daily! Each fully packed train can transport up to 1500 persons, and in some lines rush hour pick rate come to 1 train every 90 seconds. Moreover EU recent history has unfortunately shown that public transport is a privileged target for international terrorists groups. Therefore, the security of an increasing percentage of EU citizens is potentially at stake.

Moreover, on more business perspectives, as one of the speaker stressed, the US is actively preparing the security market. Securing public transport systems offers a huge market potential and the DP could prove as an important tool for opening and developing this market in the forthcoming years.

3. Challenges

Mass transport security presents many challenges: technical and technological issues of course, but also in the domains of organisation (between operators and civil authorities) and information to the users.

Indeed, one of the main differences with air transport security is that public transport network are and must offer open access. The huge continuous flow rates (up to 50 000 persons per hour in some Asian, Paris or London lines) far outpace airport security X-ray systems capabilities (scanning, false alarms...). Moreover, if citizens tolerate some of the security measures implemented before embarking for their flight as it is still for most people exceptional events, on the contrary they will probably refuse to be confronted to such obligations on a daily basis. Moreover such controls would not be compatible with the flow rates observed in many neuralgic stations at rush hour and are in this respect unsuited with public transport operation constrains.

Work Package 4 – Policy monitoring



Policy paper n°2

Frédéric Laurent, 25/03/2009

Still on the technological/technical aspects, as DEMASST reminded, the DP should also cover command and control security (attacks on such facilities as control centres could have extreme impacts) and passenger information systems (in order to limit the impact to the rest of the network and prevent any worsening of the situation). In an even larger aspect, too often public information systems, energy management systems or IT security systems that are essential elements for the correct operation of the transport network are still not interconnected and those services though managed by the operator have no easy communication systems.

Additionally on an organisational point of view, the situation is complex. The impact of an event raises tricky organisational issues between multiple operators, various level of public authorities (city, regional and/or national) as well as first responder forces. On a more down-to-earth financial aspect, as a speaker from SNCF reminded, which operator should bear the cost for the investment of security systems when a station or a track is used by multiple operators?

As the TRIPS project funded through the 2005 PASR call for proposals recalled this topic presents also a number of additional issues:

- . There is no direct coupling with the high risk events and the highest impact attacks;
- . Detection is only a part of any security concept and human reporting can be also very efficient but still presents intolerable false alarms rates and therefore data fusion systems should be developed;
- . Vulnerabilities can not be eliminated and therefore systems need to enable quick resilience in order to maximise investment return for operators.

Finally, on a purely programme management aspects, it appears that not many activities have yet be funded at EU level on this topic and that the few initiatives have been supported by a wide range of EC services. Also, this DP presents many direct interactions with some of the other expected DP (e.g. CBRNE).

4. Outcomes of the workshop

The presentations and debate have been very rich and it is not the objective of this short note to be exhaustive. However, here are some of the main outcomes that have appeared by the end of day:

- . All hazards approach:
DP must not concentrate only on targeting terrorist threats. In order to improve services, transport networks have to give a security impression to passengers and therefore the DP should adopt an all hazards approach aiming at improving the fight against criminal acts or petty crimes, but also decreasing potential consequences of fires, explosions, natural disasters, pandemics... Moreover, such approach would increase the potential added-value for end-users and increase their investment returns as it could help improving their daily regular operations.
- . Focussed approach:
As participants stressed, the range of possible threats is nearly infinite. Therefore, most of the participants agreed with EC non paper proposal to focus the DP on key security threats and therefore to pay a particular attention to neuralgic nodes.

Work Package 4 – Policy monitoring

Policy paper n°2



Frédéric Laurent, 25/03/2009

- . Modular approach:
Similarly participants agreed that the large variety of cities across EU forces to adopt a modular approach in order for the DP to be altogether cost effective and presents a high potential.
- . Demonstration:
Most participants seemed to disagree with EC initial proposal to limit testing to the virtual city of Europolis. On the contrary, in order to cover the large range of EU mid and large cities, participants proposed to make multiple on-site testing. Moreover, France presented its future experimental metro station as an example of specific facility undertaken to allow such testing.
- . End-users:
As one could have expected, all participants seemed to agree with EC proposal that involvement from end-users is a critical aspect of the DP. As main users of such system and as future customers, the developed systems must indeed answer operators' needs. Moreover, as much as possible such systems will have to be affordable for small operators and be seen as a way to improve transport services and not just as an additional burden.
- . Legal aspects:
Consensus was also broad among participants that legal and societal aspects should be an integral part of the DP in order to guarantee respect of privacy and of personal liberties. Therefore civil society and legal experts should be associated to the DP.
Additionally, many speakers stressed the necessity of a harmonised legislation at EU level on the security of mass transportation. However, all agreed that this important issue was out of the scope of the DP.
- . Standardisation and normalisation:
Consensus was similarly large that in order to favour technology transfer and structure the market, those aspects should be covered by the DP.

5. Issues still to be solved

At the end of the workshop still a few questions need to be resolved:

- . One or multiple projects:
Should the DP be implemented as one unique project or should it be pursued through a limited number of parallel projects. Each solution presents its own set of pros and cons. Indeed, as a few of the participants stressed the multiple projects approach would logically simplify the coordination of each of the individual project, would diminish the risk as the failure on one project would not affect the others and would allow a higher level of competition across EU. However such approach would only be a business-as-usual approach at FP7 level and would increase the risk of loose coordination amongst the projects, annihilating the ambition set by a programmatic approach.
On the other hand, if the one project approach would be more in line with the ESRAB highly visible flagship approach and one can argue that Europe has already proven its ability to manage far more ambitious R&D programmes, such approach

Work Package 4 – Policy monitoring

Policy paper n°2



Frédéric Laurent, 25/03/2009

would intensify the risk of creating a *de facto* cartel position for the successful consortium members on the security of mass transportation market or would present the risk of having only one proposal made by a too-large-too-manage consortium where all major security companies would share a small part.

. Demonstration:

Would a demonstration programme without any on site demonstration and testing activities make any sense? If all participants were in favour of on-site testing no precise number of demonstrations made consensus. Indeed, European cities presents a lot of differences: various scale (from mega cities of more than 5 million inhabitants to big cities of around 1 million inhabitant), various densities, various type of transportation and interconnection nodes... therefore a lot of participants raised the question of pursuing demonstrations in several cities in order to cover the great majority of European cities types. However, such demonstration activity is very resources intensive and if too many were to be conducted it may consume a high ratio of the DP budget and leave little money for technological development. Therefore if there was a consensus of not limiting to virtual testing and simulation like in the Europolis model, a trade-off between the number and kind of testing activities and the need to leave room for technological development still needs to be further refined.

. Scale of the programme:

No real debate occurred on the scale that should embrace such a project. If one expects that such project will be larger than 'classic' integration projects, the range of figures discussed is still broad: between a total cost of 25 M€ to 50 M€. Of course, such issue should be resolved in the forthcoming months as this question will constrain the budget left for all the other themes that will be open in SEC-2010-1.

Work Package 4 – Policy monitoring

Policy paper n°2

Frédéric Laurent, 25/03/2009



Annex

1. EC non paper



(Final - 21/01/09)

TOWARDS A DEMONSTRATION PROGRAMME ON Security of Mass Transportation

A 'non-paper' by European Commission, DG ENT/H4
(Contact point: Khoen Liem – draft Jan 2009)

Scope

This 'Non-Paper' is to help structure the discussions in the 18 March 2009 workshop¹ to aid the preparation of the summer 2009 call for proposals, towards a demonstration programme on 'Security of Mass Transportation'.

The expected overall FP7 funding level for a Demonstration Programme (one or a *number of individual projects*) in the area of Mass Transportation is expected to be of the order of up to about 30 Mio Euro. The workshop should also make recommendations on the number and respective focus areas of the respective project(s).

What is this Demonstration programme' about?

The purpose is to create a 'system of systems' demonstration, for Security of Mass Transportation. A holistic and systematic approach to Mass Transportation/urban transport security³ is, in other words, being sought.

This Mass transport demonstration programme (of people in urban areas) complements the work to be covered under the demonstration programme for freight, titled 'Logistic and supply chain security' and the integrated project dedicated to Airport security⁴.

Furthermore, it has to aim for the maximum possible cross-system/intermodal impact on a variety of passenger mass transportation systems (e.g. examine critical "neuralgic" nodes such as transport interchanges, where long-distance and international transport is interconnected with urban transport systems).

Other related projects

While there are some technical orientated projects ongoing / completed that are relevant to the work to be done in the 'Security of Mass Transportation' demonstration programme, current projects are narrow and technically orientated.

¹ In Berlin, organised by the German delegation

² The definition of a demonstration programme to be financed through FP7 – Theme 10 – Security research is found in the ESRAB report, page 20. See: http://ec.europa.eu/enterprise/security/doc/esrab_report_en.pdf

³ The same ESRAB report (see page 53, attached at the end of this note) specifically elaborates on the scope, the demonstration areas and the objective of this 'Security of mass transportation' demonstration project.

⁴ Covered in the 2nd security research call (Sept. 2008).

Work Package 4 – Policy monitoring

Policy paper n°2

Frédéric Laurent, 25/03/2009



Currently an effort to systematically cataloguing the EU and nationally research funded projects relevant to Security of Mass Transport is being prepared by DG TREN/E, in cooperation with DG ENTR/H. The questionnaire is expected to be circulated in the early summer of 2009 and the first result is expected by fall of 2009⁵. It is suggested that the workshop promote the collection of information for this purpose.

What is 'Mass Transportation'?

The security terminology for 'Mass Transport' used in the European Union is "Urban Transport Security" as used in the White paper 'Mid-term review of the European Commission's 2001 Transport White Paper' (COM(2006) 314 final of 22.06.2006), the European Commission's Green paper 'Towards a new culture for urban mobility' (COM(2007) 551 final of 25.9.2007) as well as in the European Commission's Communication COM (2007) 649 final of 06.11.2007, titled 'Stepping up the fight against terrorism'.

The definition of mass transportation is therefore mostly oriented towards *urban public transportation* (masses = many individuals in a confined area / Mass Transport = Urban Public Transport). Urban public transportation is, in other words, all the means of public transport that people uses daily to go to and from work and education (school etc).

'Public Urban Transport' includes:

- Metro
- Tram
- Short distance regional rail transport (e.g. RER-Paris and the S-Bahn – as used in some German cities)
- City busses
- inter-modal, critical "neuralgic" nodes (such as transport interchanges, where long-distance and international transport is interconnected with urban transport systems)

Some infrastructures are relevant to Urban Public Transport and should be considered in the project:

- Inner city stations, including its inter-functional spaces (shops, restaurants, etc.)
- Due attention should be given to major urban transportation nodes; the aspects related to the change of transportation mode need also to be addressed (e.g. some one taking the regional train changing to the Bus and spending some time in the station's coffee shop waiting for the latter)
- IT and Communication systems required for the operation and the control of the above (i.e. protection against Cyber attack to these)
- Related infrastructure, such as tunnels, bridges etc. as well as the traffic controlling and regulating systems, should be included.

Consequently, the **Freight (goods)** is excluded from the demonstration programme:

Special attention should be given to *inter-modal, "neuralgic" nodes* – i.e. interconnection points where the latter list of transport means gets into contact with urban public transport – as a critical element of mass transportation. Such inter-modal connection areas should therefore be examined as part of the proposed Demonstration Programme.

⁵ This work may be 'CIRCA based'



Who are the likely users / what impact from the research?

While the majority of the results of this 'Security of Mass Transportation' demonstration programme are expected to be implemented in the medium term (5 to 10 years) time frame, some longer term aspects may also be tackled. In any case, the results will need to be implementable by providers and users/demanders e.g. the operators of urban public transport. Accordingly, a very strong participation from the 'demand side' is considered necessary; the security requirements capture need to be lead by those that will be closest with the daily operations. The participation from the technology supply side (including the industry) is, on the other hand, required to ensure that ambitious, yet realistic solutions are being pursued. The right balance will lead to success, thereby benchmarking and validation of proposed solutions must be made inherent to this demonstration programme.

- Operators of Mass transport systems
- Owner of Mass transportation infrastructure (public and private)
- Operator / franchiser / tenants in public spaces (restaurants, shops, booths, etc)
- Intelligence services
- Security services (including private security companies)
- Police (including the transport police such as the 'Bahnpolizei' in Germany)
- Rescue services like fire brigades, etc
- Urban transportation planners
- Civil society / Human-right / Privacy organisations
- Owner of real estate (stations, etc)
- Manufacturers of mean of mass transport (Metro rolling stock, busses, signalling system, communication system etc).

What kind of security solutions should be demonstrated?

Taking the ESRAB suggestions as starting point, an appropriate, clear and complete work programme text has to be drafted. The Security Research Call 1 (published Dec. 2006) called for the *first phase* of this demonstration programme⁶, to define the strategic roadmap and ensure EU wide awareness.

Further relevant findings – and, last but not least those from the workshop - will also contribute to the definition of the actual (*second phase*) work programme.

- *The scope and technical content of this full demonstration programme (phase 2)* will be the demonstration of a consistent and integrated set of mass transportation security systems to secure transport networks, nodes and platforms, taking into account the specific requirements for each sector/mode and the particular European-wide dimension of urban public transport. Due consideration should be given to European added-value of research in this security domain.

⁶ A Project was selected for funding subsequent to that Phase 1 call; the DEMASST project is currently being prepared. As of September 2008, the security scrutiny process on this proposal is still on-going; the project is yet to start.

Work Package 4 – Policy monitoring

Policy paper n°2

Frédéric Laurent, 25/03/2009



Only with a thorough understanding and appreciation of the security situation of an Mass Transport system, will it be possible to establish the understanding of where security improvement needs lie. In other words the stakeholders must be brought together, a risk-assessment and resilience analysis must be developed, before a cost effective security plan can be developed. Against this, the off-the-shelf availability of product and services will be mapped and short comings identified.

This covers e.g:

- Security systems designed to meet specific requirements for mass transportation networks, transfer nodes and platform interiors;
- Interoperability of different security systems managed by different operators and/or between different EU countries;
- Comprehensive threat detection systems fusing data across diverse and distributed networks and analysing threats via spatial/pattern recognition techniques. Detecting, tracking and tracing individuals, crowds and objects within, and across, transport systems, while respecting the personal integrity of individuals;
- Post-event situation analysis systems capable of rapidly accessing and piecing together different multi-media and digital data to re-enact a sequence of event;
- Common operational picture integrating and displaying data from a diverse set of sources on optimised man machine interfaces utilising intelligence based alarm management;
- Neutralisation and containment systems for attack avoidance, suppression or nullification.
- Appropriateness of security measures with respect to given legal, cultural and societal environment

The interoperability requirements will drive standardisation in this area. Accordingly interoperability needs also to be seen to as a mean to create the European wide market for equipment for these applications.

Identification of the Priority Scope of the Demonstration Programme

In order to maximize its EU-wide impact, the demonstration programme should primarily focus critical "neuralgic" nodes such as transport interchanges, where long-distance and international transport is interconnected with urban transport systems.

The reasons for this approach are many-fold:

I. Political Priority

In the Commission Communication of 6 November 2007 entitled 'Stepping up the fight against terrorism', Urban Transport Security (COM(2007) 649 final), urban public transport is considered one of the priority areas for action.

This follows on from the March 2004 bombing of the urban public transport system in Madrid which led to the European Council Declaration on Terrorism (March 2004) and the call by Presidents' and Heads of States' call for enhancing security in European Transportation.

The July 2005 bombings of the urban public transport in London shows the continuing vulnerability of this sector.



II. Insufficient research

Furthermore, significant security relevant research has already been made on issues related to other modes and means of transport (e.g. airport security), whereas research related to the area of urban public transport has so far not received the same level of attention, especially at the level of 'demonstrators'.

III. Volume of passengers using urban public transport

The mere volume of people using urban public transport is a significant indicator of the relative size of the problem. For instance, the urban public transport systems in London and Paris *alone* are used by approximately 7.3 billion passengers per year⁷. Furthermore, the *open access* of the urban public transport, as opposed to very regulated access to e.g. airports, further stresses the need to consolidate research work on urban transport Security.

IV. Cross-border and European dimension

The same fundamental security issues arise for all big cities in Europe, highlighting the existence of a potentially very important EU-wide market for new security solutions. In addition, many big cities in Europe are situated on the border to a neighbouring country, such as for example Copenhagen/Malmoe, Strasbourg/Kehl, Lille/Tournai etc.

A possible approach to the 'Security of Mass Transport' demo programme

The objective of the workshop is to also elaborate on the substance and on the structure of the activity. The demonstrator should also have a 'cohesion' effect. This is expected to happen by bringing several European cities and mass transport systems to participate in the project and by that share their experiences so as to broaden the basis of the project.

One possibility would be to demonstrate on a *virtual* mid-size / large city (over 0.5 Mio inhabitants). For convenience let's name this virtual city '*EUROPOLIS*'. The challenge the programme has (projects have) to tackle is the security of mass transport in this virtual metropolitan area. The demonstration programme (one or a number of projects, depending on the ultimate level of integration required) is then constructed around this case study:

Europolis is a typical European mid-size city with 0.5 million inhabitants (this size is selected to be large enough to have mass-transport issues and since there are many European cities of this size while there are only a few mega-cities (over 10 Million inhabitants) in Europe). It may borrow the definition of 'mass public transportation' as seen in cities across Europe of this size (Stockholm, Cologne, Brussels, Prague, Budapest, etc etc.).

People in Europolis depend on public transportation. While the surrounding communes and suburbs of the city is 'post 2nd world-war' the inner city stems from the middle ages. The city planners, already since the eighties of last century, reacted by closing parts of the city, the area around the historical city, for cars and motor bike. Public transportation becomes the principle

⁷ E.g. London and Paris transport 20 million passengers per day i.e. almost 7 ½ billion passengers per year. Frankfurt airport, in comparison, transport 56 million annually.

Work Package 4 – Policy monitoring

Policy paper n°2

Frédéric Laurent, 25/03/2009



means for people to commute if they work here. Many of the administration offices, large corporate head-quarters, the university buildings, shops, as well as many SMEs in the IT&C sector are located here.

During the peak hours, the city's public transportation is operated beyond its limits, making this very vulnerable for terrorist's attacks of any kind, be it hard attacks (e.g. Bombs) or soft attacks (e.g. Cyber).

There are a number of 'neuralgic' transport nodes in Europolis. These are places (interchanges) where different transport means meet. Here wide area and even international traffic meets urban transport. For example, Europolis' international train station is a crossing point for two high speed lines. The same train station also serves as a regional traffic, serving the suburban areas and beyond. It also is well connected into the city's urban traffic network; the bus station is located just adjacent to the train station and underneath the international train station, 2 metro lines are available. Europolis share an international airport with its neighbouring twin city. One of the international high speed line stops at this newly constructed airport, furthermore a fast shuttle train service is available to the international train station in the inner-city.

To perform of a systematic study defining potential security issues related to its mass transport, Europolis' city council invited a group of wise men from other similar sized European cities. The model then developed, is to be checked against a) existing models for similar sized European cities and b) emerging requirements (for similar sized cities).

The concept of "modelling" might be expanded in order to assess the possible response of the "system of systems" to different possible threats/risks (including possible cost/benefit analysis of possible security solutions).

An outlook into the foreseeable future is of great importance given the long planning cycles for urban areas. The urban mobility concept of today will evolve to that of the future; some vectors leading to some changes are 'sure to come'. Future mobility will be impacted by tighter environmental requirements, cost of fuel, demography, etc. Security must become a design factor in the conception of future functioning and sustainable urban mobility.

As result of the systematic study, a number of security 'bottle necks' has been identified. Some partner cities are also addressing this issue for their own mass transport; (sub)projects are then set-up, aiming at the improvement of specific issues. The result of this work is then shared.

Work Package 4 – Policy monitoring

Policy paper n°2

Frédéric Laurent, 25/03/2009



2. Pre Berlin workshop Draft paper distributed to participants

DRAFT:

**Towards a text on Demonstrator on Mass Transportation,
for inclusion in the WP2010 - 3rd call Security Research.**

(pre-Berlin workshop draft version - 17 March 2008)

Overall scope: "Security of Mass Transportation"

The purpose is to create a 'system of systems' demonstration, for Security of Mass Transportation. A holistic and systematic approach to Mass Transportation / Urban transport security is, being sought. Furthermore, it has to aim for the maximum possible cross-system / intermodular impact on a variety of passenger mass transportation systems (e.g. examine critical "neuralgic" nodes such as transport interchanges, where long-distance and international transport is interconnected with urban transport systems).

Focusing on the security of "Urban public Transportation"

The objective of mass transportation security in this demonstration programme is focused towards *urban public transportation*, defined as all the means of public transport that people uses daily to go to and from work and education (school etc). Accordingly, it **includes**: Metro, Tram, Short distance regional rail transport (e.g. RER-Paris and the S-Bahn, City busses, Inter-modal, critical "neuralgic" nodes (such as transport interchanges, where long-distance and international transport is interconnected with urban transport systems).

Some infrastructures are relevant to Urban Public Transport means and should be considered in the project, such as: Inner city stations, including its inter-functional spaces (shops, restaurants, etc.), IT and Communication systems required for the operation and the control of the above (i.e. protection against Cyber-attack to these), Related infrastructure, such as tunnels, bridges etc. as well as the traffic controlling and regulating systems, should be included.

Due attention should be given to major urban transportation nodes; the aspects related to the change of transportation mode need also to be addressed. Therefore special focus should be put on *inter-modal, "neuralgic" nodes* – i.e. interconnection points where several other transport modes (also long distance) gets into contact with urban public transport – as a critical element of mass transportation. Such inter-modal connection areas should therefore be part of the Demonstration Programme.

Freight transport is excluded from the demonstration programme:

Expected users / beneficiaries

The results of the demonstrator should be implementable by providers and users/demanders e.g. the operators of urban public transport. Accordingly, a very strong participation from the 'demand side' is considered necessary; the security requirements capture need to be lead by those that will be closest with the daily operations. The participation from the technology supply side (including the industry) is required to ensure that ambitious, yet realistic solutions are being pursued. The



right balance must be assured, thereby benchmarking and validation of proposed solutions must be made by: Operators and Owners of Mass transportation infrastructure (public and private), Operator / franchiser / tenants in public spaces (restaurants, shops, booths, etc), Intelligence services, Security services (including private security companies), Police, Rescue services like fire brigades, Urban transportation planners, Civil society / Human-right / Privacy organisations, Owner of real estate (stations, etc), Manufacturers of mean of mass transport (Metro rolling stock, busses, signalling system, communication system etc).

How to structure the proposal

The demonstrator should have a 'cohesion' effect. Thus bringing several European cities and mass transport systems to participate in the project and by that share their experiences so as to broaden the basis of the project.

Identification of the Priority Scope

In order to maximize its EU-wide impact, the demonstration programme should primarily focus critical "neuralgic" nodes such as transport interchanges, where long-distance and international transport is interconnected with urban transport systems.

Cross-border and European dimension is a prerequisite. The same fundamental security issues arise for all big cities in Europe, highlighting the existence of a potentially very important EU-wide market for new security solutions. In addition, many big cities in Europe are situated on the border to a neighbouring country, such as for example Copenhagen/Malmoe, Strasbourg/Kehl, Lille/Tournai etc.

Only with a thorough understanding and appreciation of the security situation of an Mass Transport system, will it be possible to establish the understanding of where security improvement needs lie. In other words the stakeholders must be brought together, a risk-assessment and resilience analysis must be developed, before a cost effective security plan can be developed. Against this, the off-the-shelf availability of product and services will be mapped and short comings identified. This covers e.g:

- Security systems designed to meet specific requirements for mass transportation networks, transfer nodes and platform interiors;
- Interoperability of different security systems managed by different operators and/or between different EU countries;
- Comprehensive threat detection systems fusing data across diverse and distributed networks and analysing threats via spatial/pattern recognition techniques. Detecting, tracking and tracing individuals, crowds and objects within, and across, transport systems, while respecting the personal integrity of individuals;
- Post-event situation analysis systems capable of rapidly accessing and piecing together different multi-media and digital data to re-enact a sequence of event;
- Common operational picture integrating and displaying data from a diverse set of sources on optimised man machine interfaces utilising intelligence based alarm management;
- Neutralisation and containment systems for attack avoidance, suppression or nullification.

- Appropriateness of security measures with respect to given legal, cultural and societal environment

The interoperability requirements will drive standardisation in this area. Accordingly interoperability needs also to be seen to as a mean to create the European wide market for equipment for these applications.

Expected impact / EU added value / expected deliverables

Integration and demonstration tasks are in essence very complex. This requires restricting the perimeter of the DP to a demonstration which should be self supporting in a scenario with unit of place and time, specifying the target or targets, the threats and associated scenarios.

The DP should provide a demonstration of "system of systems" solutions to enhance the security of urban public transportation for typical mid-size European city with over 0.5 million inhabitants. The challenge the demonstrator has to tackle is the security of mass transport in a metropolitan area and should be benchmarked accordingly. The systems / technologies demonstrated should be demonstrated with 'real hardware' in a number of relevant places.

The DP would nonetheless be required to have a fully European dimension, and make best use of the pertinent projects conducted within the national and /or European frameworks, focusing on their possible integration with a view to better responding to meting operational challenges. The DP should make it possible to bring together from many countries the private and public end users able to provide the input data of the pertinent scenarios as well as the assessment (validation/test) criteria.