Challenge Report
Team Rail A

Background
Challenge
Report
Presentation
Team Members
The 20th ASEF Summer University (ASEFSU20) was held from 15 August – 3 September 2016 across China, Mongolia and the Russian Federation on the theme “Gateways to Asia and Europe: Connectivity by Land, Sea and Air”. 47 participants representing 45 ASEM partner countries joined the 3 week educational journey and solved real-life challenge scenarios on the topics of connectivity and transportation linked with 4 major transportation modes: 1) road, 2) rail, 3) maritime, and 4) air.

The route included Beijing, Harbin, Vladivostok, Chita, Irkutsk and Ulaanbaatar, and each of the 6 cities visited focused on a different facet of connectivity. Participants attended lectures, trainings and workshops on the specific topic and also simultaneously explored it hands-on through site visits to historically important locations, transportation hubs and commercial centres.

The participants, carefully chosen from 8,222 applicants, developed business plans, mobile applications, social media strategies, policy briefs and promotional materials on the 9 following challenges:

- Safe transportation of cultural artifacts
- Accessibility to public transport for physically disabled people
- Green logistics
- Spread of infectious diseases through increased air traffic
- Security at railways
- Sustainable ecotourism
- Frameworks on the management of autonomous underwater vehicles
- Combat of human trafficking at major transportation hubs
- Enhancing the visibility of the ASEM Transportation Ministers’ Meeting (ASEM TMM).

Organised by the Asia-Europe Foundation (ASEF), the ASEFSU20 journey was made possible due to the joint efforts of many partners involved in this project: the Ministry of Foreign Affairs of the People's Republic of China, the Ministry of Foreign Affairs of Mongolia, the Ministry of Foreign Affairs of the Russian Federation, the Ministry of Education and Science of the Russian Federation, Beijing Jiaotong University, Harbin Institute of Technology, Vladivostok State University of Economics and Service, Transbaikal State University, Irkutsk State University, Mongolian Youth Federation and Ulaanbaatar Railway Joint Venture Company. The project was also supported by the Far Eastern Federal University, Russian Railway Tours, UNICEF, Heiko Seibel Fotographie, Fraport AG, Subnero, Safehouse Foundation, Chester Beatty Library, the European Network on Independent Living among many others.
Challenge
Team Rail A

#rail #security #connectivity
How can security for train and underground transportation systems be increased, while keeping the principles of affordability, accessibility and rapid change at bay?

#rail #security #connectivity
Estimations by the International Union of Railways state that in 2014, 3,070.2 billion passenger-kilometres\(^1\) were travelled worldwide on trains. Of this, about 15% was travelled in Europe (including Turkey), 4% was travelled in the Russian Federation, and 78% in Asia, Oceania and the Middle East. Simultaneously, 9,690.2 billion tonne-kilometres\(^2\) were travelled worldwide in 2014. Of the freight, 6% was travelled in Europe (including Turkey), 24% in the Russian Federation and 35% in Asia, Oceania and the Middle East. The massive increase in people using public transportation both domestically and internationally is due to greater urbanisation and better and faster transportation systems such as the high speed railway.

Efficient passenger transport requires a complex and well interconnected layout with many access and exit points at transit stations. Transportation networks also have to pass through the city or countryside.

The popularity of railway and underground transportation has also attracted the attention of terrorists. As railways and underground transportation systems are hard to secure, they have been an intersection point for acts of terrorism: either as the means by which a terrorist attack can be executed or as the end or target of a terrorist attacks. (Taylor, “Terrorist Attacks and Transport Systems”.)

Some well-known examples include the 1995 sarin gas attack in the subway of Tokyo, Japan, the 2004 Madrid train bombings, the 2005 London bombings, the knife-attack in 2014 in Kunming, China, a 2015 attack on a high-speed train between Amsterdam, the Netherlands, and Paris, France, and a subway bomb in 2016 in Brussels, Belgium.

Through policy research and recommendations, the S. Rajaratnam School of International Studies advises governments and other stakeholders on ways to increase security transportation systems, while keeping the principles of affordability, accessibility and rapid change at bay.

Your Mission: Your mission is to assist them by crafting out-of-the-box, creative solutions like apps, campaigns, policy recommendations, environmentally-friendly initiatives, etc., to help mitigate and eventually overcome this problem.

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1) A passenger-kilometre is the unit of measurement representing the transport of one passenger by a defined mode of transport over one kilometre.

2) A tonne-kilometre is the unit of measurement of freight transport representing the transport of one tonne of goods (including packaging and tare weights of intermodal transport units) by a defined mode of transport over one kilometre.
Further Reading

Information on public transportation infrastructure and networks:


Information on terrorism linked to public transportation:


Further Reading


TERRORISM ON RAILWAYS

Hillary BRIFFA (Malta), Menno VAN DER KAMP (Netherlands), Naoya MATSUMOTO (Japan), Tanya CHONG (United Kingdom), KHUC Minh Chi Bao (Vietnam), Aloysius ANG (Singapore)
Preface

This report supports the final presentation of the challenge, Rail A, on terrorism on railways which was given as the final result of the ASEF 20th Summer University, on 2 September 2016. In the presentation, as well as in this report, problems and solutions concerning terrorism in the public transport domain are linked. Attention is mainly paid to preventing railway stations, railway tracks and trains from an attack. Existing literature, own experiences and expert discussions have led to a wide variety of solutions.

The idea of this challenge is linked to recent research done by S. Rajaratnam School of International Studies (RSIS). This is a leading research and graduate teaching institution in strategic and international affairs in the Asia Pacific. RSIS conducts research in subjects pertaining to security, defence, diplomacy and international affairs. RSIS also organises lectures, conferences and seminars that are aimed at helping policymakers to develop comprehensive approaches to strategic thinking.

The research for this challenge has been conducted in the framework of the 20th Asian-Europe Foundation (ASEF) Summer University. 47 participants from 45 countries discussed many different topics in the field of connectivity between the two continents. In total 9 challenges have been tackled by the participants, of which this challenge was done by 6 participants. Our backgrounds do have a wide variety: from urban planning, to civil engineering and history. This variety proved to be very valuable for having different insights to the actual problem.

We are grateful for the support of the Asia-Europe Foundation (ASEF) and the experts which gave us interesting insights. In particular, we would like to thank the Deputy Minister for Education of the Russian Federation, Mr Veniamin Kaganov, for his interest, his views and his recommendations. We are looking forward to the readers’ opinion and to its follow-up.

Any questions regarding this paper can be directed to asefsu@asef.org.

Research Question

Terrorism in the public transport domain is a growing problem and needs global, forward-thinking solutions. Recent historical incidents have shown that relatively small efforts caused huge impacts, both physically and psychologically. Thinking about solutions for preventing terrorist attacks requires the paradigm shift that zero-risk does not exist. It is therefore that the aim should and will be to minimising the risk of the occurrence of next terror attacks, which could be achieved by introducing a set of multiple solutions.

The main research question reads as follows:

*How can security for train and underground transportation systems be increased, while keeping the principles of affordability, accessibility and rapid change at bay?*
Setting the scene

Efficient passenger transport requires a complex and well interconnected layout with many access and exit points at transit stations. Transportation networks also have to pass through the city or countryside. The popularity of railway and underground transportation has also attracted the attention of terrorists. As railways and underground transportation systems are hard to secure, they have been an intersection point for acts of terrorism: either as the means by which a terrorist attack can be executed or as the end or target of a terrorist attacks.

Some well-known examples include the 1995 sarin gas attack in the subway of Tokyo, Japan, the 2004 Madrid train bombings, the 2005 London bombings, the knife-attack in 2014 in Kunming, China, a 2015 attack on a high-speed train between Amsterdam, the Netherlands, and Paris, France, and a subway bomb in 2016 in Brussels, Belgium.

Mass transit systems are “open,” offer high concentrations of people, and provide the potential to cause largescale disruption and fear, as was stated by Daniel B. Prieto from Belfer Center for Science and International Affairs. The systems are inherently difficult to secure because of the volume of riders, high number of access points with few obvious inspection and control areas, the need for convenience, and lowcost fares with no requirement of advance purchase or passenger identification.

It is not because those charged with security are unable to imagine what terrorists might do. It is rather that people seldom support costly and potentially disruptive measures to protect them against things that haven’t occurred. In his report, Brian Michael Jenkins from RAND Corporation, describes that the reality is that because terrorists can attack anything, anywhere, any time, while we cannot protect everything, everywhere, all the time, security, tends to be reactive. Certainly we must try to protect targets that terrorists show a proclivity to attack.
Methodology

The figure below shows the methodology, used in this research for the report. Its procedure can be broken down in 4 steps:

Step 0. Preliminary Research: Conduct readings on existing researches and articles, and obtaining comprehensive understanding on the topic. The overview of this section is as seen in the previous chapter.

Step 1. Open Brainstorming: Team members will individually write down their ideas of potential problems and solutions we will be focusing on, and gather them onto a shared mind board;

Step 2. Mapping and Classification: Ideas on the mind board were classified into larger subsets and headings. Solutions were categorised into 4 larger categories: Software, Hardware, Human, and Intelligence & Psychology. This enables to systematically visualize and contextualize the problems and solutions, and specify the countermeasures and strategies that should be selected for in-depth elaboration.

Step 3. Role Coordination and Proposal Design: Every member was allocated a section to focus on. 4 members each worked on 1 of the 4 solution categories to reflect deeper thoughts on the proposal. Proposals of the difficulties and feasibility of each individual solutions were analysed, and were ultimately developed into example proposals of policy recommendations or product solutions.
Solutions

By means of brainstorming, the challenge team has come up with different sets of solutions. In order to group these variety of solutions, 4 different categories could be differentiated:

1. Hardware
2. Software
3. Human
4. Intelligence & Psychology

In this chapter, these 4 categories will be elaborated.

1. Hardware

The hardware category deals with improving the physical vulnerability of railway transportation. Representative example of this will be installing scanners alike aviation security models. Others include ideas such as separation of luggages from passengers to diminish the risks of hidden explosive and weapons, and protecting the infrastructure such as fencing off all railway tracks to prevent access from attempts to tamper with the tracks. Another interesting idea that was proposed was installing massive train scanners. This technology has not been completed yet to our knowledge, but has the potential of greatly reducing the inspection time of carriages in certain checkpoints such as borders. However hardware solutions generally confront the issue of financial feasibility and accessibility.
2. Software

The software category aims to reinforce the security system of railway transport, especially in public spaces such as stations and carriages. This includes tying identification information to ticket purchases, and enhancing profiling methods utilizing technologies such as facial and fingerprint recognition or simply increasing the number of surveillance cameras. Many of these solutions both require investments in hardware upgrade and installments, which again confronts the issue of feasibility and accessibility. Another direction of solution is to improve the public participation by introducing methods that will incentivise people to participate more into improving the security and raising awareness. For instance, creating an app function that will enable people to report anything suspicious, alert people emergency information or give instructions when evacuating.

3. Human

The human category mainly focuses on training and education of both train staffs and the public. As we have reviewed though previous studies, the primary objective of terrorists are to spread terror, and casualties are secondary. Therefore, better response and resilience will reduce the incentive of terrorists. Training of both transit staffs and commuters to have a role in security by reporting suspicious activities and, identifying suspicious (especially unattended) packages and luggage. This also ties in with our reporting solution in the software segment of our plan in terms improving the ease of reporting incidents. To improve emergency response preparations, emergency routes and evacuation protocols can also be included in existing widely adopted rail company mobile applications to better inform the public of what to do during an emergency. This would provide a low cost approach that can reach out to many targeted commuters. To improve the realism, interactivity and effectiveness of the game, virtual reality or even augmented reality technology can be used. The games could be built on Google cardboard so that the public can put themselves in the situation of a terror attack situation and learn how to react and respond accordingly.

4. Intelligence and Psychology

The psychology and intelligence category are solutions that are targeted towards potential terrorists individuals or groups, and minimise the possibility of them conducting terrorism. The first subset of solutions utilises psychological strategies which will inherently demotivate their actions. On one hand, there are direct examples such as putting up posters that will make terrorists last-minute aware of their impact. On the other hand, these also include subliminal approaches. As an example proposal for a solution of religion-related terrorisms, is installing prayer rooms of various religions in the station to show respect and integration of different religions in the society. The second subset of solutions uses intelligence to predetermine potential threats and prevent their actions. These solutions are strongly related with profiling solutions from the software section, but focus more on preventive countermeasures that will be conducted outside of transportation facilities.

Conclusion

This report outlines a range of solutions in a bid to tackle the problem of potential terrorist attacks on railways. Bearing in mind that every nation exists in its particular geo-political context, with disparate financial capacity and constraints, not all solutions are applicable in a one-size-fits-all approach. It is subsequently recommended that the ideas contained herein be examined and selected according to applicability for nations on an individual basis. Since one magic bullet solution does not exist, a combination of measures may be adopted to support one another and target as many of the extant security gaps as feasible.
RAIL A TEAM CHALLENGE

TERRORISM ON RAILWAYS

Hillary BRIFFA (Malta), Menno VAN DER KAMP (Netherlands), Naoya MATSUMOTO (Japan), Tanya CHONG (United Kingdom), KHUC Minh Chi Bao (Vietnam), Aloysius ANG (Singapore)
How can security for train and underground transportation systems be increased, while keeping the principles of affordability, accessibility and rapid change at bay?
Railways
(stations, railway tracks, trains)

Passenger traffic
(no particular attention for cargo)
PROBLEMS

Mass Transit Systems

Difficulties

- High # of People
- Open
- Large scale disruption & fear
- Low cost fares
- Need for convenience
- # of riders
- High # access points
- Few inspection & control areas
- High # of People
- Open
- Large scale disruption & fear
- Low cost fares
- Need for convenience
- # of riders
- High # access points
- Few inspection & control areas
PROBLEMS

Where?

How?

BOMBING

HOSTAGES

SABOTAGE

ROADSIDE AMBUSH

BIO AGENTS

ARSON
PROBLEMS

- CCTV
- Public drills
- Fast medical response

EXISTING EXAMPLES

- Best practices from airports
- Efficacious forensic procedures
PROBLEMS

Keep fares low but safe…

Financing?

Terror vs Economy

Fear deters mobility

Panic

Undermines government
Terrorists can attack...\n
While we cannot protect...\n
ANYTHING ANYWHERE ANYTIME\n
EVERYTHING EVERYWHERE ALL THE TIME...
PROBLEMS

- Rapid Response
- Open Society
- Net Security Benefit
- Technology
- Infrastructure
- Intelligence

How to resolve?
METHODOLOGY

Theme

Problems

Solutions
METHODOLOGY

Problems

Solutions

Categories

Theme

Software

Hardware

Human

Intel/Psych
METHODOLOGY

Problems

Solutions

Categories

Software

Hardware

Human

Intel/Psych

Proposals
METHODOLOGY
SOLUTIONS

HARDWARE
Luggage separation,
Infrastructure protection,
Alternative transportation

SOFTWARE
Identification, profiling,
surveillance, tracking,
public participation

PSYCH & INTEL
Psychological disincentive,
Counter terrorism

HUMAN
Training and response,
Best practices,
Information sharing
Human CCTV

- Surveillance and Public Participation
- Adding functionality to existing app
  allow public to report suspicious behaviour
Free WiFi

- Profiling
- Increase availability of Public Wifi
  enable data collection about passengers
ID Ticketing

- Identification & Tracking
- Require individual identities to be associated with each journey made
  enables data collection about passengers
SOLUTION

HARDWARE

- Physical barriers
- Maximum impact, minimum effort
- Stations, trains and infrastructure
Body Scanners

- X-ray scanners in Asia
- Body scanners at airports
- Less appropriate for rapid mass-transport
Luggage Separation

- Dedicated vehicles for luggage
- Paradigm shift
- Examples found in pre-transport for aircraft
Training and Awareness of Transit staff

Emergency response personnel

General public
Approach

- Prevention
- Prevention awareness
- Public vigilance identification
- Identification and reporting
Approach

- **Response**
  
  Emergency response and evacuation plans
  Drills and exercises
  Emergency response training
Posters and video campaigns

In-app evac plans
• Google cardboard location tracking games for ID and response
• VR situation training
Intelligence

- Nations collaborate on intelligence activities
- Information on terrorists made public
  Posters at stations
Psychology

- Install prayer/meditation rooms in stations
- Media in train/station about potential terrorist attacks
CONCLUSION

- No magic bullet
- Share best practices
- Adapt to context

COMBO APPROACH
CONCLUSION

No magic bullet
Share best practices
Adapt to context

NO FEAR

APPROACH

COMBO
TEAM MEMBERS

Mr Naoya MATSUMOTO
Japan
Peking University / Kyoto University

Naoya is on a full scholarship at the Yenching Academy of Peking University where he does research on structural transformations in Beijing's urban space caused by the dynamism of demographic and sociological transition. He previously represented Japan at the 5th ASEM Rectors’ Conference and Students’ Forum (ARC5) on employability. Naoya has a Bachelor’s in Engineering with a major in Architecture from Kyoto University and previously interned with the Indonesian Ministry of Public Works in the Tanjung Priok Road Construction Project, a Japanese ODA project that involves multinational joint-operations.

Ms Hillary BRIFFA
Malta
King’s College London

Hillary currently pursues her Ph.D. in War Studies at King's College London. Her research focuses on if small states can have a Grand Strategy. Being a Youth Ambassador to the Organisation for Security and Co-operation in Europe (OSCE) in Malta, and worked closely with international institutions, covering issues ranging from development of the organisation's Declaration on Youth and Security to patrols with the Special Monitoring Mission to Ukraine and running of workshops in Kyrgyzstan. She interned at the Malta High Commission to the United Kingdom, and presently conducts research for FromOverHere strategic consultancy. Hillary received the U.S. State Department’s inaugural ‘Emerging Young Leaders’ award this year.

Mr Menno VAN DER KAMP
Netherlands
European Parliament

Menno studied Civil Engineering, with a particular focus on Transport, Infrastructure and Logistics, at the Delft University of Technology. Previously, he worked at the European Commission and was in charge of investment strategies of one of the richest transport flows in Europe. Presently, he works for the European Parliament and assists MEP Matthijs van Miltenburg on a wide range of transport issues.
Mr Aloysius ANG

Singapore

Things Pte. Ltd.
Aloysius’ expertise lies in the fields of entrepreneurship and sustainable development. He is the co-founder of Things.com and has supported over 100 start-ups at *SCAPE, an incubation space in Singapore. Aloysius also runs events sponsored by the government to promote the Maker movement in Singapore.

Ms Tanya CHONG

United Kingdom

Siemens Rail Automation Ltd

Tanya studied Mechanical Engineering before proceeding with a postgraduate degree in Innovation Design Engineering from the Royal College of Art and Imperial College London. During her studies, she worked on projects like fuel cell system development, sustainable alternatives to product consumption, and the enhancement of human motion. Tanya currently is a Graduate Engineer with Siemens Rail Automation, where she provides engineering input on a number of ongoing and future British rail projects.

Mr KHUC Minh Chi Bao

Vietnam

Mitsubishi

Minh graduated from Nanyang Technological University in Singapore with a Bachelor’s degree in Mechanical Engineering. As a Mechanical Engineer with Mitsubishi, he currently focuses on the maintenance and optimization of mechanical and electronic components of the Mitsubishi trains operating in Singapore. In 2013, he led a team that designed a solar car sponsored by Shell Oil & Gas Corporation.