



Présentation du projet

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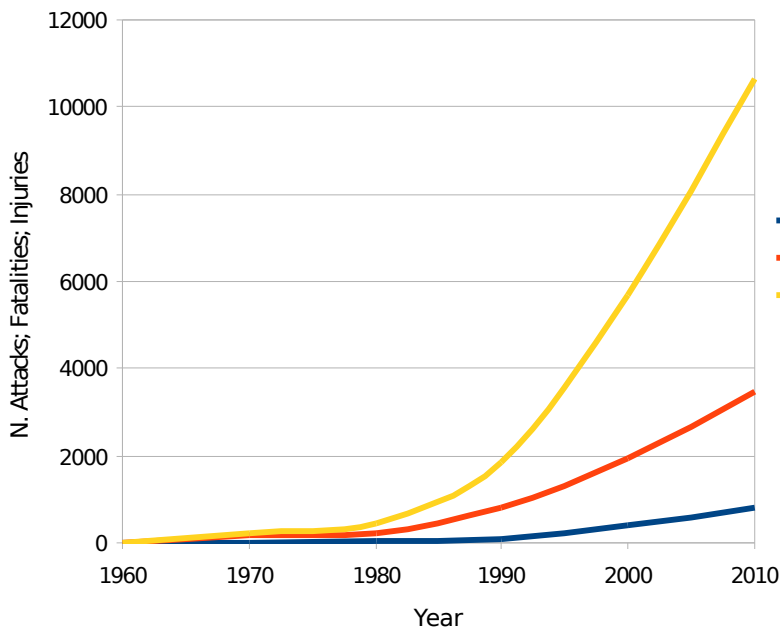
23 juin 2011





- Projet PCRD.
- 36 mois, 2010-2013.
- Coordonné par Newrail (Université de Newcastle) .
- 11 partenaires UK, français, italiens et espagnols.
- IFSTTAR : ESTAS (coord.), LEOST et DEST.





● Primary Threat: Bombing

—70% of all fatalities

—77% of all injuries

● Attacks on vehicles more lethal than infrastructure.

—73% of fatalities were onboard the vehicle.

—90% of metro vehicle fatalities were onboard the vehicle.



- 7/7/2005 London Bombings



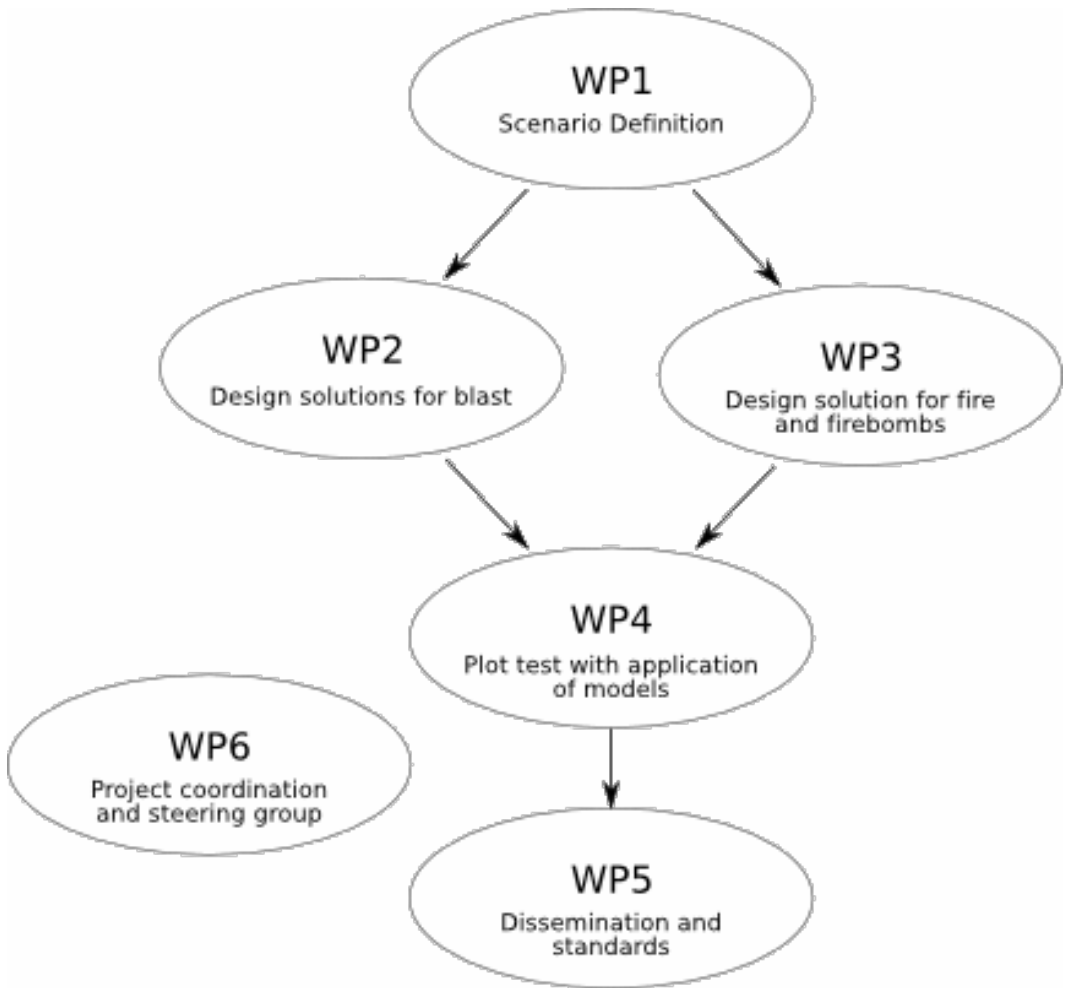
- 11/3/2004 Madrid Bombings





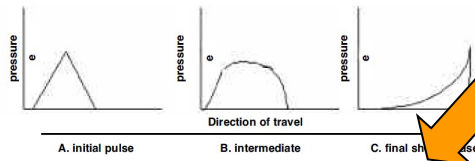
- Améliorer la résilience des rames de métro aux attentats à la bombe et aux bombes incendiaires par le choix des matériaux et des structures.
- Rechercher des solutions pouvant s'adapter aux changements de la menace terroriste durant les 30-40 ans de durée de vie des véhicules ferroviaires.
- Rechercher des solutions adaptées aux véhicules neufs et comme adaptation des matériels existants.



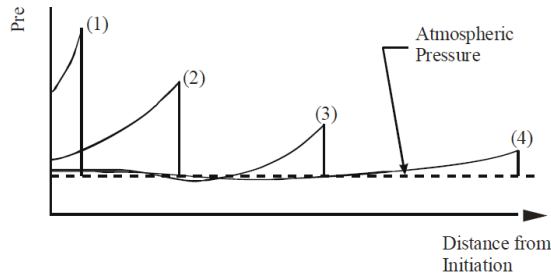
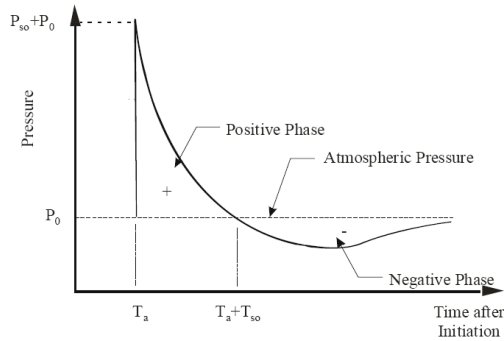




Bombe



Onde de choc Souffle



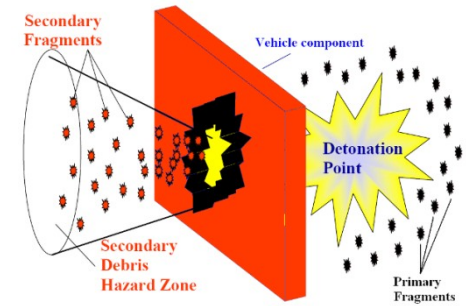
Chaleur Feu

Fragmentation

Primaire



Secondaire





- Propulsion de fragments du véhicule et de l'intérieur, qui se transforment en projectiles.
- Perte de l'intégrité structurelle, provoquant l'effondrement du véhicule.
- Déraillement ou collision, entraînant l'immobilisation en tunnel, la perte de l'alimentation électrique, des communications, des incidents secondaires dans le trafic proche.
- Comportement humain dans une telle situation.

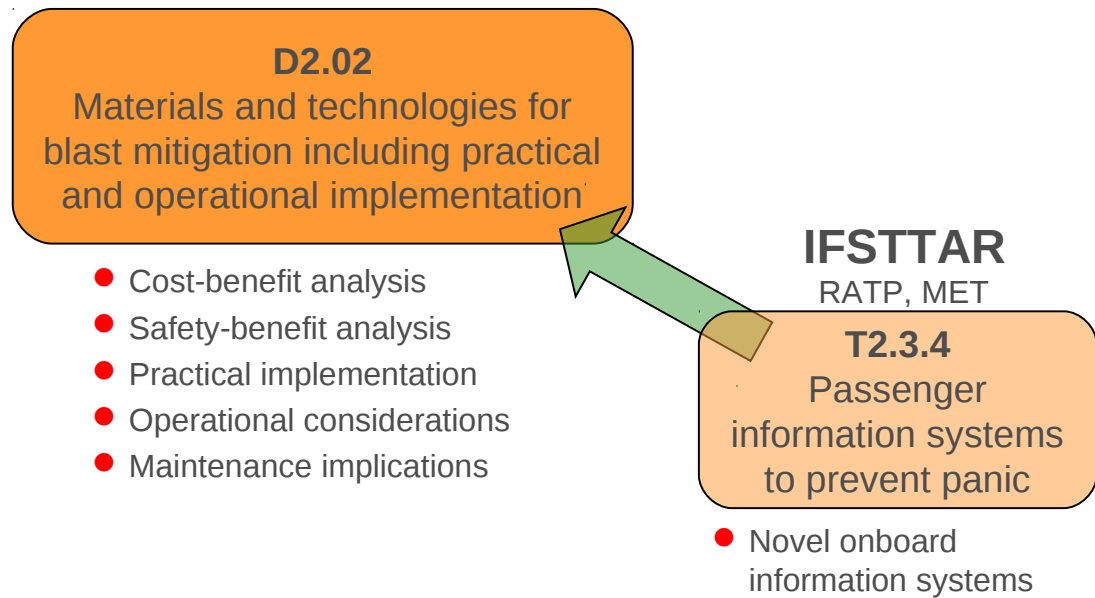


- Sélection des matériaux :
 - Propriétés mécaniques / géométriques des fragments (tranchant !).
 - Capacité à absorber l'énergie.
 - Capacité de déformation sans rupture.
- Techniques d'assemblage permettant de contrôler le comportement.





- Accepter des dommages structurels locaux en évitant un effondrement progressif.
- Matériaux présentant des propriétés fortement directionnelles, un comportement super-élastique, etc.
- Les systèmes critiques doivent être protégés des déformations : alimentation, éclairage, ouverture des portes, etc.



Panic?

- *“A sudden unreasoning terror often accompanied by mass flight ” (Webster dictionary)*
- Losing the control of oneself, running blindly and selfishly from a danger.
- The « obvious » reaction expected (aimed) in a dramatic situation such as a terrorist attack.
- Quite often reported to have caused deaths in fires, stampedes, etc.

Panic?

- The common perception of panic is an old conception (G. Le Bon, 1895) that has led to consider the crowd as part of the problem:
 - ➔ Give the public as little information as possible “to avoid creating a panic”.
 - ➔ Don’t allow people access to the equipment (e.g. doors cannot be operated by passengers).
 - ➔ Don’t rely on the public to provide information on the situation.

~~Panic~~

- **But... It hardly ever happens in actual situations**
- The word “panic” is often used to talk about mere fear or anguish, which is quite different.
- Individual panic does exist, but is almost systematically allayed by neighbouring survivors.
- Social behaviour is not lost in emergency situations.



Co-operation, help, concern for others

- Very often mentioned spontaneously.
- Not related to a feeling that danger is out.
- People can help others at the risk of their own safety.



4 conditions pour panique:

- *Possibilité* d'être bloqué.
- Crainte de conséquences *immédiates*.
- Isolement (= pas d'aide).
- Impuissance (= pas de moyen d'agir).

+ (*peur de la panique*)

Need for information/communication

- Anguish stems from not knowing:
 - How to behave (flee, stay, where to go?)
 - If someone will come to the rescue
- Disorganisation stems from not knowing what the situation is:
 - Particularly difficult in underground
 - People on the spot (survivors) are a source of information
- Communication means are essential:
 - To inform the control centre of what happens
 - To be informed of what to do

Need for guidance/reassurance

- Several sources for this:
 - Staff on the spot
(driver, when exists)
 - Trained people
(importance of e.g. fire drills)
 - Radio communications
(must be guaranteed to work)
 - Permanent instructions
(e.g. how to use the emergency exits)
 - Adaptive signage
(e.g. light path to exits – cf. airplanes)

- Conducteur:
 - Loge de conduite blindée.
- Eclairage:
 - Pour évaluer sa situation et pouvoir agir.
- Moyens d'évacuation:
 - Portes opérables de l'intérieur, résistantes aux explosions.
- Communications bidirectionnelles:
 - Recevoir des informations et des instructions
 - Informer sur sa situation
- Radio souterraine résistante aux explosions
- Trousse de secours
 - Permettre les premiers soins
 - Besoin d'être acteur quand nécessaire

D5B.01 Project website
<http://securemetro.com>

- ✓ General presentation
- ✓ Functionalities
- ✓ Areas
- ✓ Documents
- ✓ Suggestions
 - Mailing lists :
 - ❖ *All participants*
 - ❖ *Steering committee*
 - ❖ ...



The screenshot shows the SECUREMETRO project website. At the top, the logo 'SECUREMETRO' is displayed with the tagline 'Inherently secure blast resistant and fire safe metro vehicles'. A navigation menu includes Home, News & Events, Organisation, Partners & Contacts, Results, and Private Area.

Home
 SECUREMETRO is a Collaborative Project - Small or medium-scale focused research project.

Aim
 Increased safety, security and resilience of metro vehicles from terrorist attack by explosives and firebombs through materials choices and design, thereby increasing resilience and reducing the impact of attack on passengers, staff, infrastructure and property.

Objectives
 The goal of this research project is to develop validated materials selection and design strategies for building metro vehicles with intrinsic security features. The Securemetro project will consider threats from conventional explosives and firebombs. The four project objectives are:

- To increase metro vehicle resilience to terrorist bomb blast through selection of vehicle materials and structural design.
- To increase security against a firebomb attack through design of fire barriers and fire suppression technology while also contributing to passenger safety from accidental or vandalism fires.
- To increase the resilience of vehicles to blasts in order to speed-up recovery following attack,

Brochure
 A brochure icon is shown with the text 'SECUREMETRO' and 'Inherently secure blast resistant and fire safe metro vehicles'.

Upcoming Events
 20/04: WP3, WP4 and WP5 Kick-off meeting
 21/04: UIC World Security Congress 2010

Logos for the European Union and the 7th Framework Programme are visible at the bottom right of the website screenshot.