A Toolkit for Counterterrorism and Crime Prevention at Complex, Multimodal Stations

Applied Criminology & Policing Centre,
University of Huddersfield, UK

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Project funded by EU **DG-MOVE**

Overview – Project PreEmpt

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- Phase 1
  - In 2014, EU DG Mobility & Transport (DG-MOVE) asked the Applied Criminology and Policing Centre to identify ‘best practice’ solutions to secure complex stations (Multimodal Passenger Terminals) from terrorist attacks and serious crime
  - We developed an approach based on Mixed Methods and a practically and Scientifically Realistic approach to knowledge, leading to an outline toolkit
- Phase 2
  - In 2017 we were asked to develop a working toolkit based on the outline, additionally covering a wider range of crimes
  - The toolkit was handed over in late 2018
- This presentation describes the process and the results of the project

Phase 1
Pre-Empt Project Aims

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- **To understand** how MMPTs operate and tactical security challenges they face
- **To identify** ‘best practice’ solutions to secure MMPTs from terrorist attacks and serious crime
- **To produce** an indicative toolkit
- **To inform** the development of a pan EU Land Transportation Security Strategy

How to identify What Works?

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- Originally EU asked us for **meta-analysis** of evaluation literature
- But we had read Lum's (2005-9) systematic review of CT evidence
  - Scanned some **20000 studies** representing **billions of $£€**
  - Only **7** passed a 'relaxed' methodological quality filter
  - These were **very general** and **not necessarily relevant to land transport MMPTs** – e.g. 'screening of passengers at airports is cost-effective'
- And we know that evaluating impact of interventions on **very rare events** is very difficult
  - RCT and quasi-experimental designs impossible

What to do instead of a conventional Systematic Review?

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- So a conventional meta-analysis not feasible
- Nor can 'EMMIE'-type guidance (Systematic+Realist Review) be produced in same way (https://whatworks.college.police.uk/toolkit/About-the-Crime-Reduction-Toolkit/Pages/About.aspx)
  - **E**ffect – the impact on crime
    Mechanism – how it works
    Moderators – where it works best
    Implementation – how to do it
    Economic assessment – what it costs

- But practitioners and policymakers still need advice – ASAP!
- How then to make the best of what knowledge exists?
- We developed an alternative approach based on Mixed Methods and a realistic – and Realistic – approach to knowledge

Mixed Methods Approach: Conceptual Attack Framework

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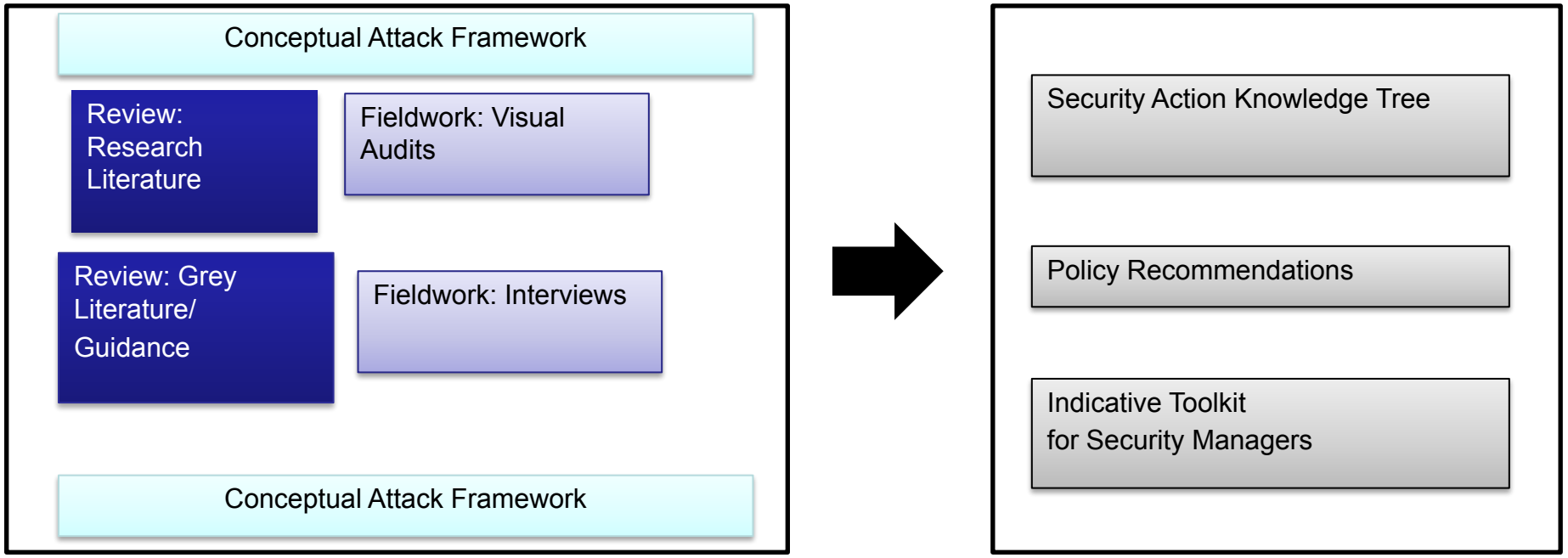
- Mapped out theoretically plausible **attacks:** ***Methods – Weapons – Targets – Scripts***
- Mapped theoretically plausible **security responses**
- Organised detailed **findings** from literature, fieldwork on **knowledge trees**
- All brought together under a **conceptual attack framework**



The challenge for the Conceptual Attack Framework (CAF)

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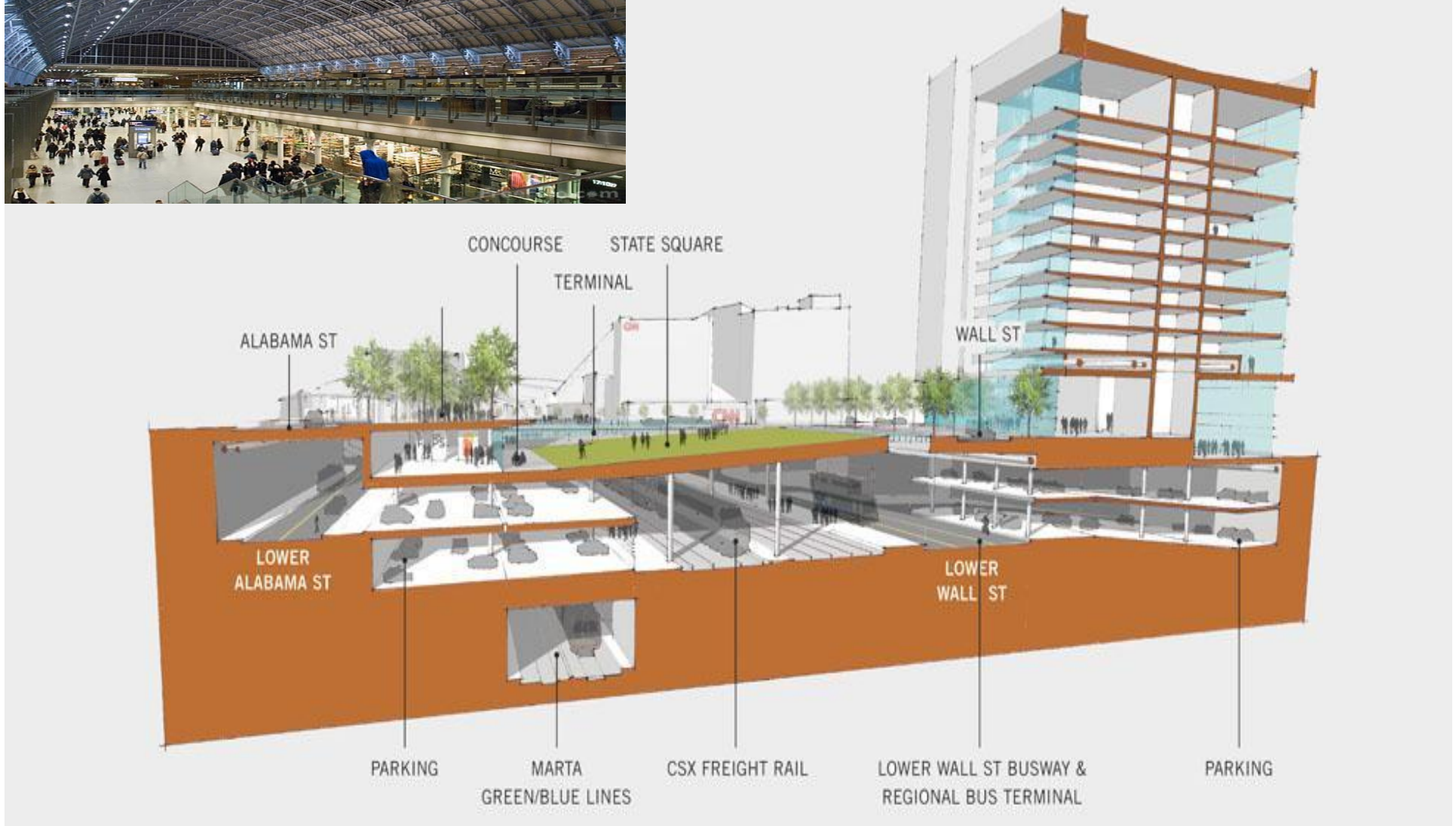
- Conceptual Attack Framework (CAF) had to:
  - Handle complexity of MMPTs, and complexity/ diversity of terrorist attacks
  - Cope with huge variety of findings – nature, scope, level, quality, origin, format
  - Connect with theory & terminology in SCP, security
  - Prime the planning of Realist Review and Fieldwork
  - Facilitate synthesis of results at strategic, operational and tactical levels
  - Feed into/ help to structure (eventual) practical toolkit, beginning with outline version

Complexity of MMPTs



Complexity of MMPTs

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Transport, Infrastructure & Land Use	Integral/ Adjoining Retail/Leisure Facilities	What varies between MMPTs
Transport Mode Over-ground Rail Metro System Tram System Bus Station Taxi Rank **Infrastructure** Waiting areas Concourses and platforms Walkways Escalators Elevators Ticket & other barriers	Retail outlets Supermarkets Pubs and Bars Fast food establishments Restaurants	Environmental Design Opening/ Closing times Responsibility for security Training of security staff Surveillance & communications (equipment & practices) Land & property ownership Jurisdictions for security staff (patrols) Governance Structures Vetting of staff Site maintenance requirements /practices Partnership working Passenger flows by time Flows of other site users (employees, visitors, customers) Vehicles (passenger vs. freight trains) Open and restricted areas for site users Entry and exit points Environmental Quality

Diversity of attacks & interventions

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- **Rand study of terrorist attacks** identified:
  - 13 attack **methods** (marauding, bombing, arson etc)
  - 14 **weapon** types (guns, bombs, chemicals etc)
- We identified 9 **target types** (passengers, security personnel, buildings etc)
- UK Police's **Operation Griffin** identified 11 stages of generic **attack procedure**, each with a greater/lesser number of alternative script tracks
- We know from SCP that there are diverse **interventions**:
  - 25 Techniques, 5+ CPTED principles
  - 11 generic proximal causal factors for crime/terror events (Conjunction of Terrorist Opportunity)
  - 11 Ds – mechanisms by which to influence offenders…
- A helluva lot of permutations/combinations for practitioners!

Conceptual Attack Framework – construction principles

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- CAF maps out theoretically plausible **attacks**
  - Attack **Methods – Weapons – Targets**
  - Attack **Procedures** (scripts)
- Maps out theoretically plausible **security responses**
  - Based on **5Is** process model – Intelligence, Intervention, Implementation, Involvement, Impact
  - Covered both **Prevention** (centred on opportunity) and **Preparing for first response**
- Takes detailed **findings** from literature and fieldwork
- Assesses the **quality of evidence and of action** in each case
- Organises findings on a '**knowledge tree**', which
  - Aids retrieval
  - Links with theory
  - Puts like with like
  - Identifies knowledge missing from literature and practitioner experience: 'for gaps you need maps'

Conceptual Attack Framework – Tactical Attack Methods

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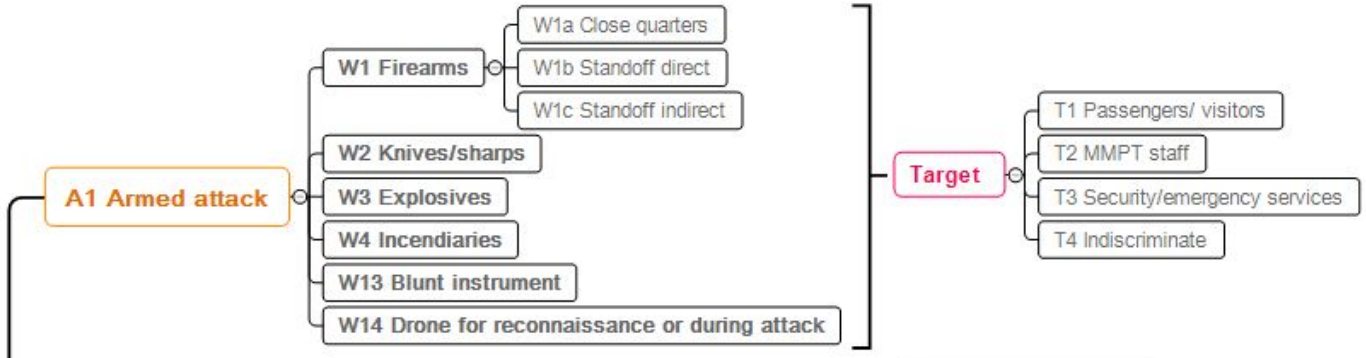
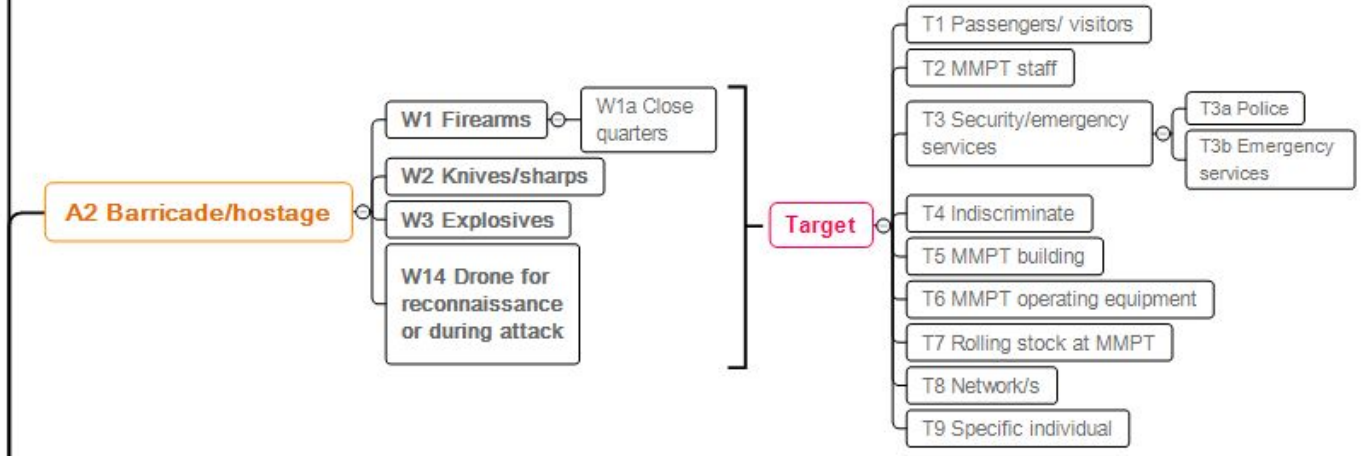
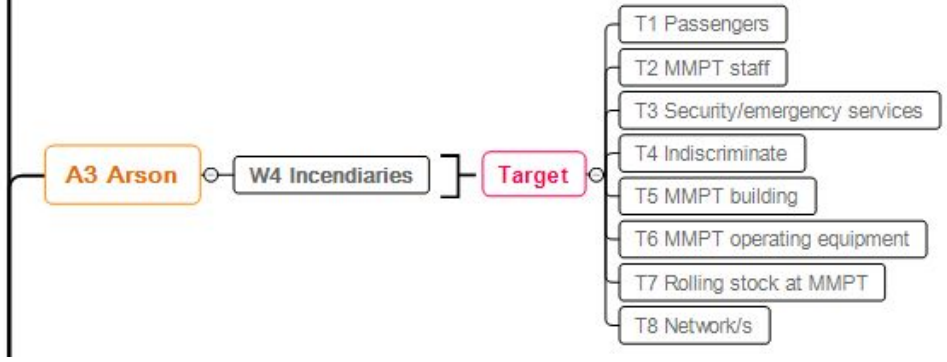
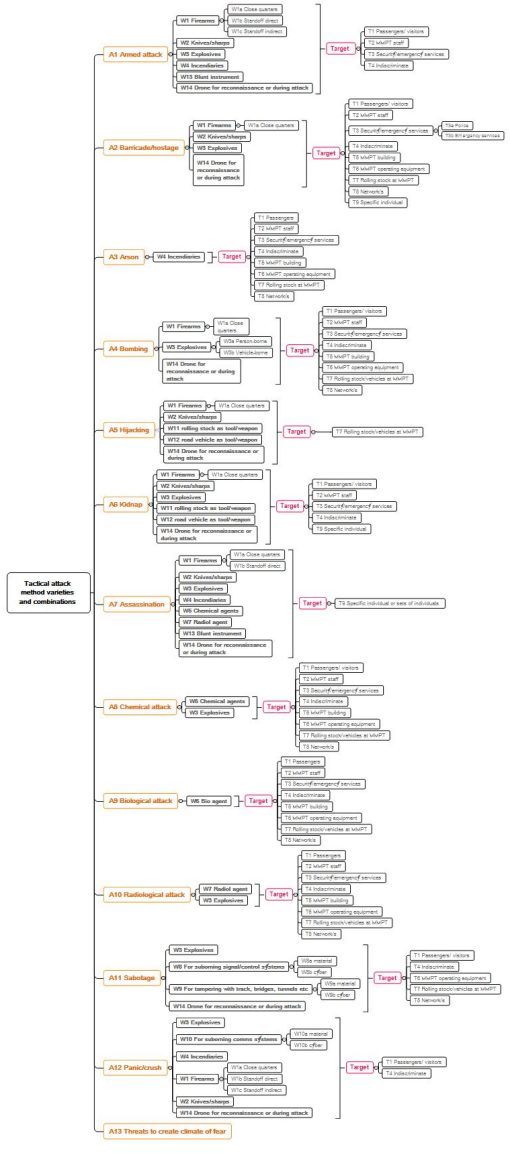
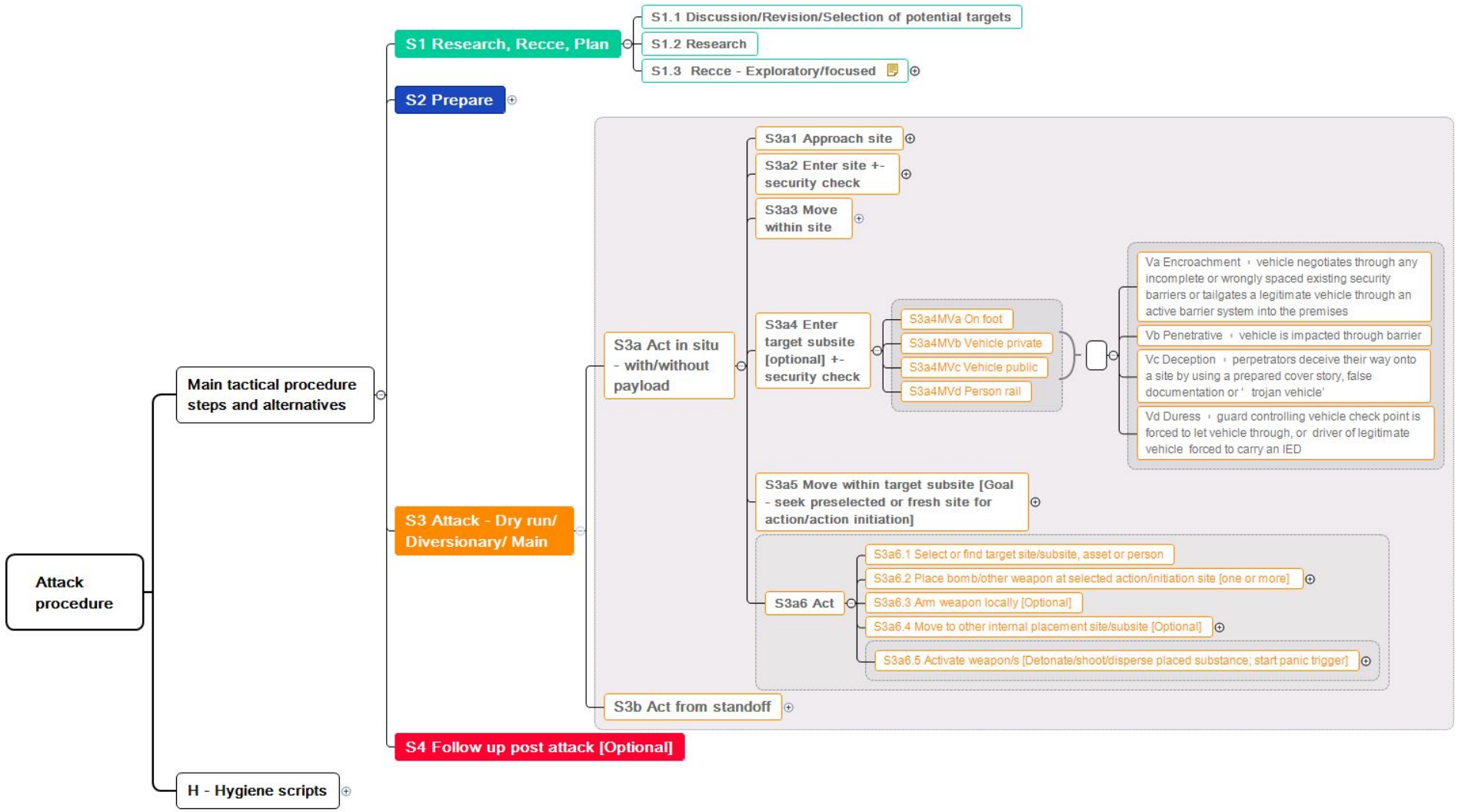


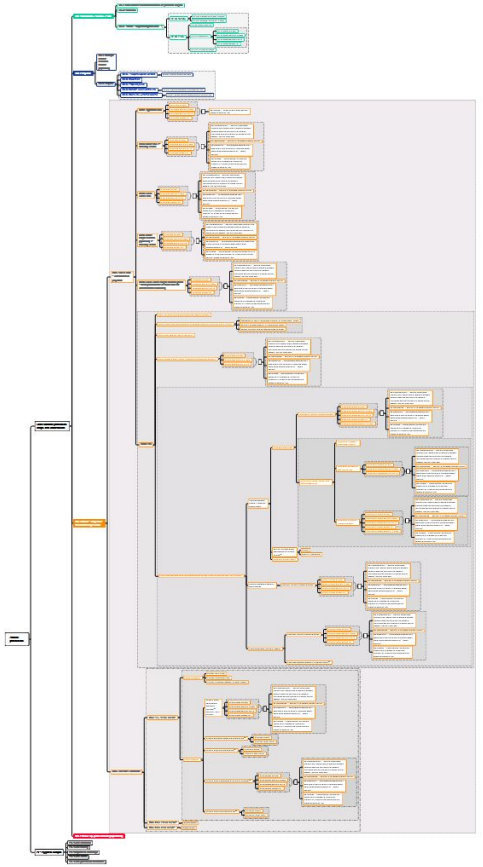




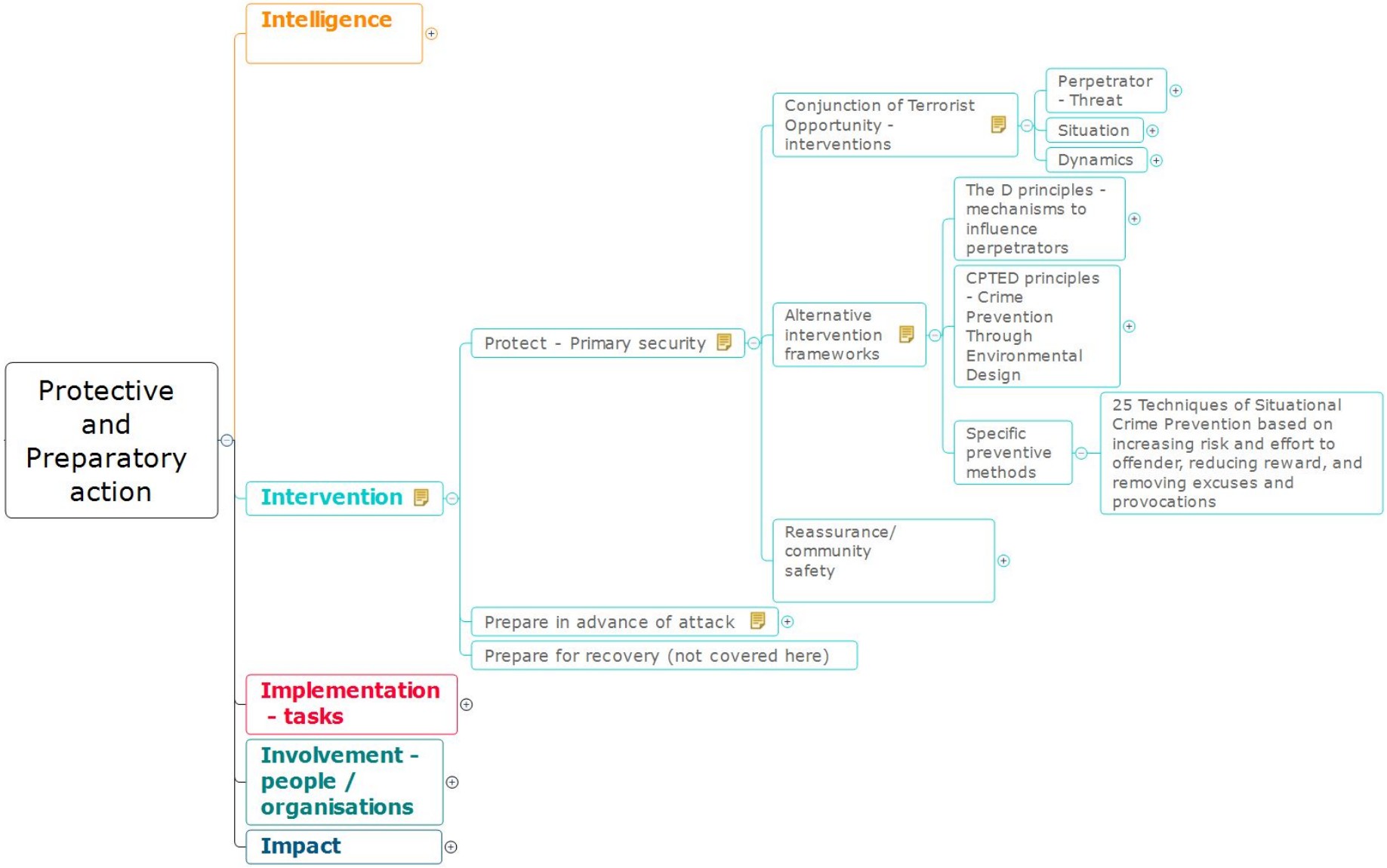


Conceptual Attack Framework – Attack Procedures





Conceptual Attack Framework – Security action



Realist Review of literature

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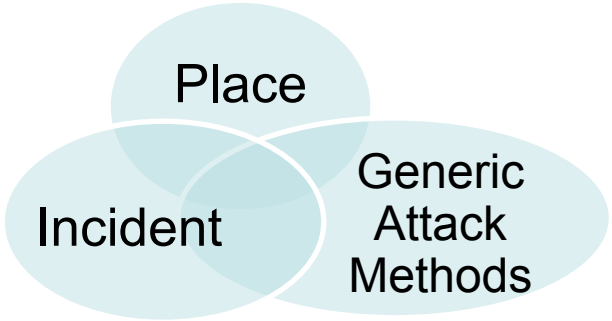
- Based on relevance
  - Developing a synthesis of knowledge
  - Less concern with quantification, effect sizes and standardisation
  - More concern with theoretical plausibility, context
  - Include ‘experience based knowledge’
- Searched 15 Bibliographic Data Bases
  - Keyword searches



- Approached relevant organisations and experts
- 409 relevant items identified (abstract/title)
  - 143 published/266 grey literature
- 139 documents reviewed in depth
  - Inclusion/Exclusion Criteria

Fieldwork

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- To gain experience of contrasting MMPT environments
  - Visited 4 stations in several EU countries
  - Interviews with police officers, counter-terrorism security advisers, other security personnel and site managers
- To gain insights/capture experience based knowledge
  - Management of security incidents
  - Different agencies involved
  - Partnership working
  - Available resources
  - Existing security interventions
  - Recognised good practice
  - Areas of concern

Evidence Quality Assessment – Literature

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Evidence quality	Type of Evidence	Practice quality
E1	Experimental Comparative Designs	**P+1 'Best Practice'** – strong research evidence that the practice was effective in its implementation and impact and outperformed alternatives
E2	Experimental Observational and Simulation Designs	**P+2 'Good Practice'** – strong research evidence of effectiveness in implementation & impact, without comparative element; or moderate research evidence with/without comparison
E3	Expert Consensus	**P+3 'Potentially Good Practice'** – assessments of implementation and impact moderate to strong, with/without comparison but based on consensus of opinions from experts & respected authorities/ organisations rather than research
E4	Expert Opinion	**P+4 'Highlighted Practice'** – claimed as effective or ineffective in literature but without supporting evidence
E1,2,3		**P- 'Practices to avoid'** – literature suggests these not beneficial; and strong-moderate research evidence and/or a consensus of expert opinion to support this claim

Evidence Quality Assessment – Fieldwork

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Practice quality level		Description
P+	Recognised Good Practice	A practice judged to be good practice depending on context
P+/-	Practice positive/ negative	A practice that may be good or that should be avoided depending on context
P0	Indeterminate practice	A practice where there is neutral or uncertain evidence to make a judgement either way
PCon	Contradictory Practice	Identification of a contradiction in the effects of the practice requiring resolution e.g. through re-design / modification
P-	Practices to avoid	Practices assessed as less than satisfactory (irrespective of context)

CAF: Consolidating Findings on the Security Action tree

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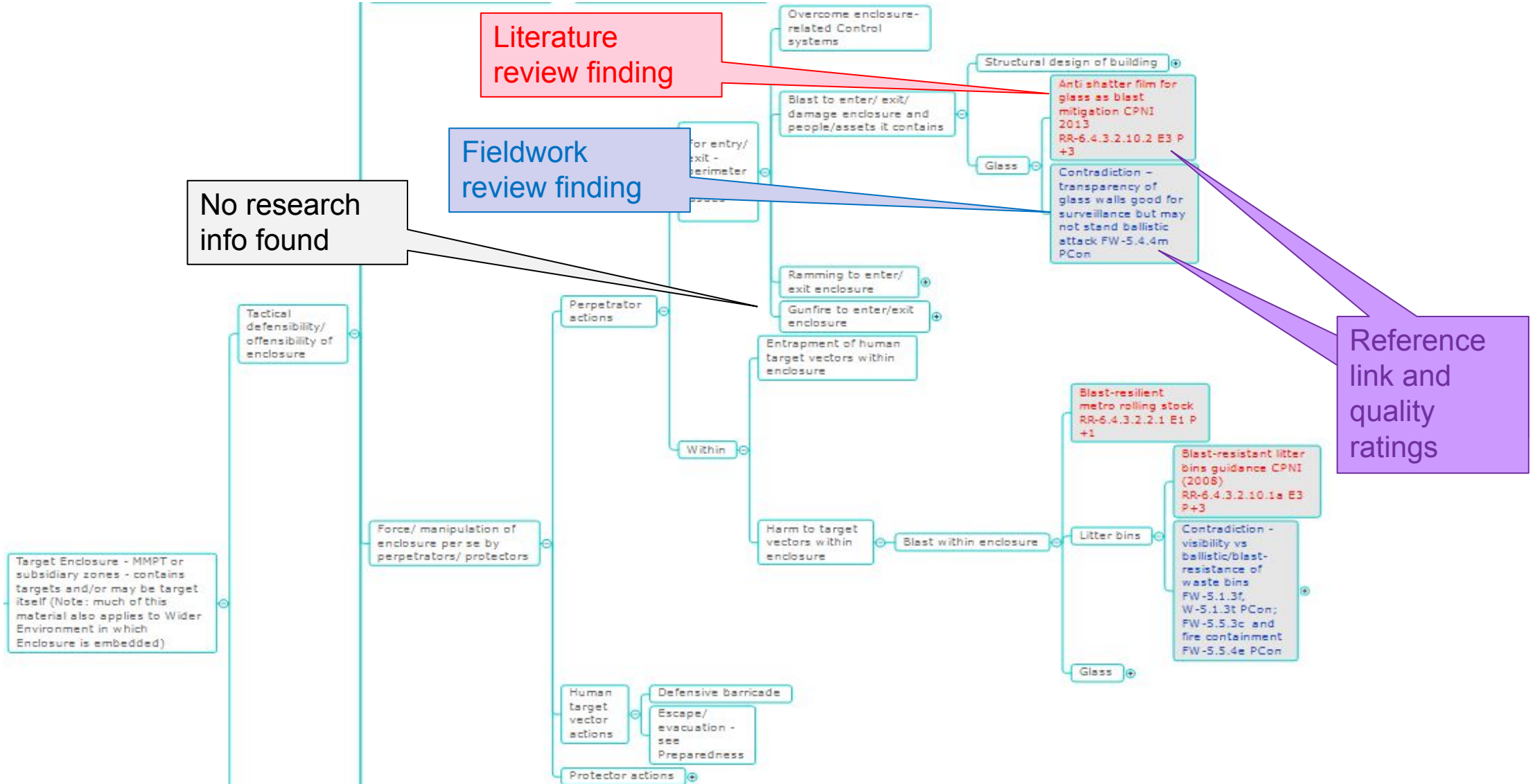

CAF: Entire Visual of findings – 130+ from Fieldwork and 200+ from Realist Review

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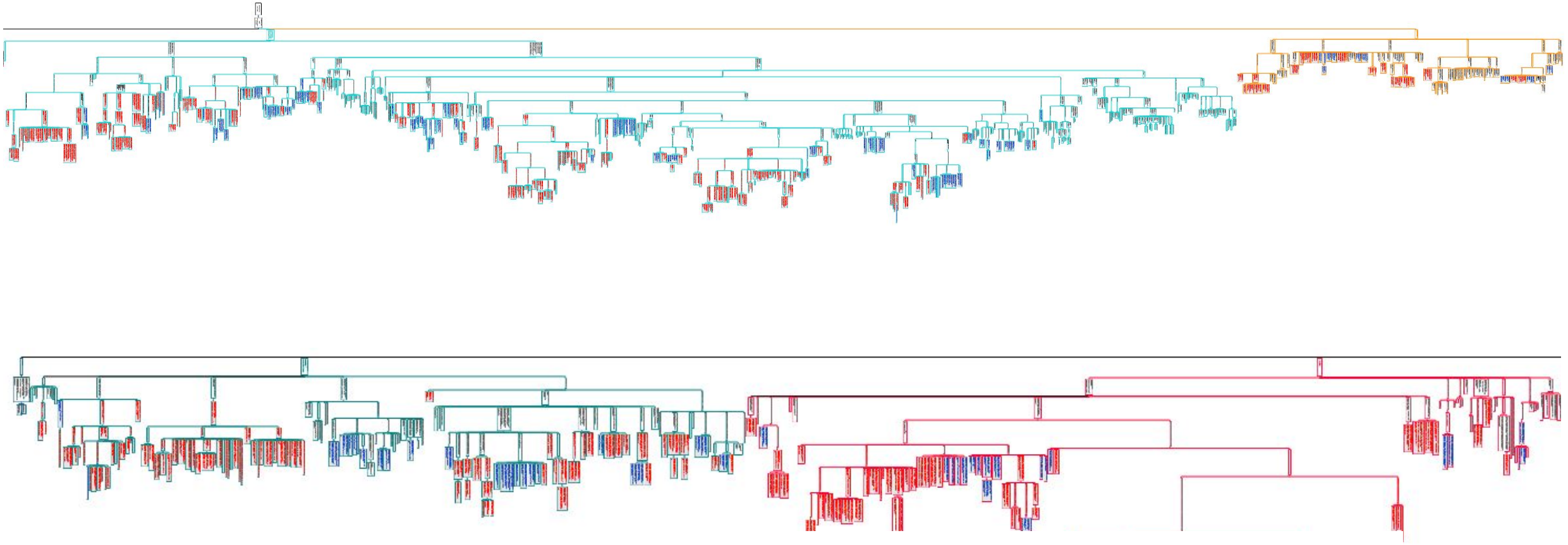

How it all fits together

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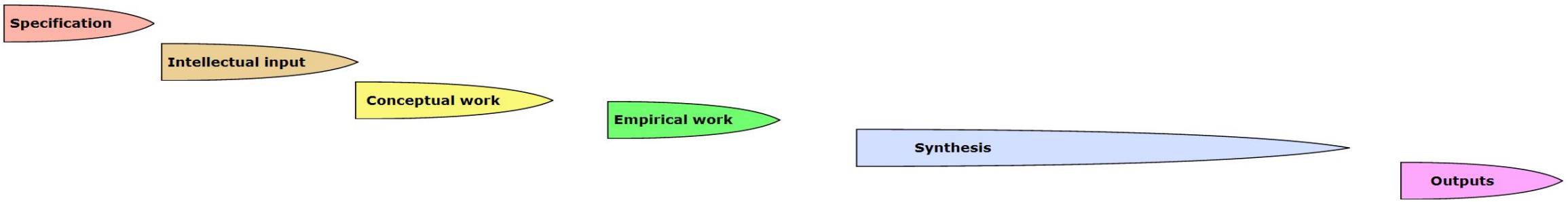
* Animated slide *



How it all fits together

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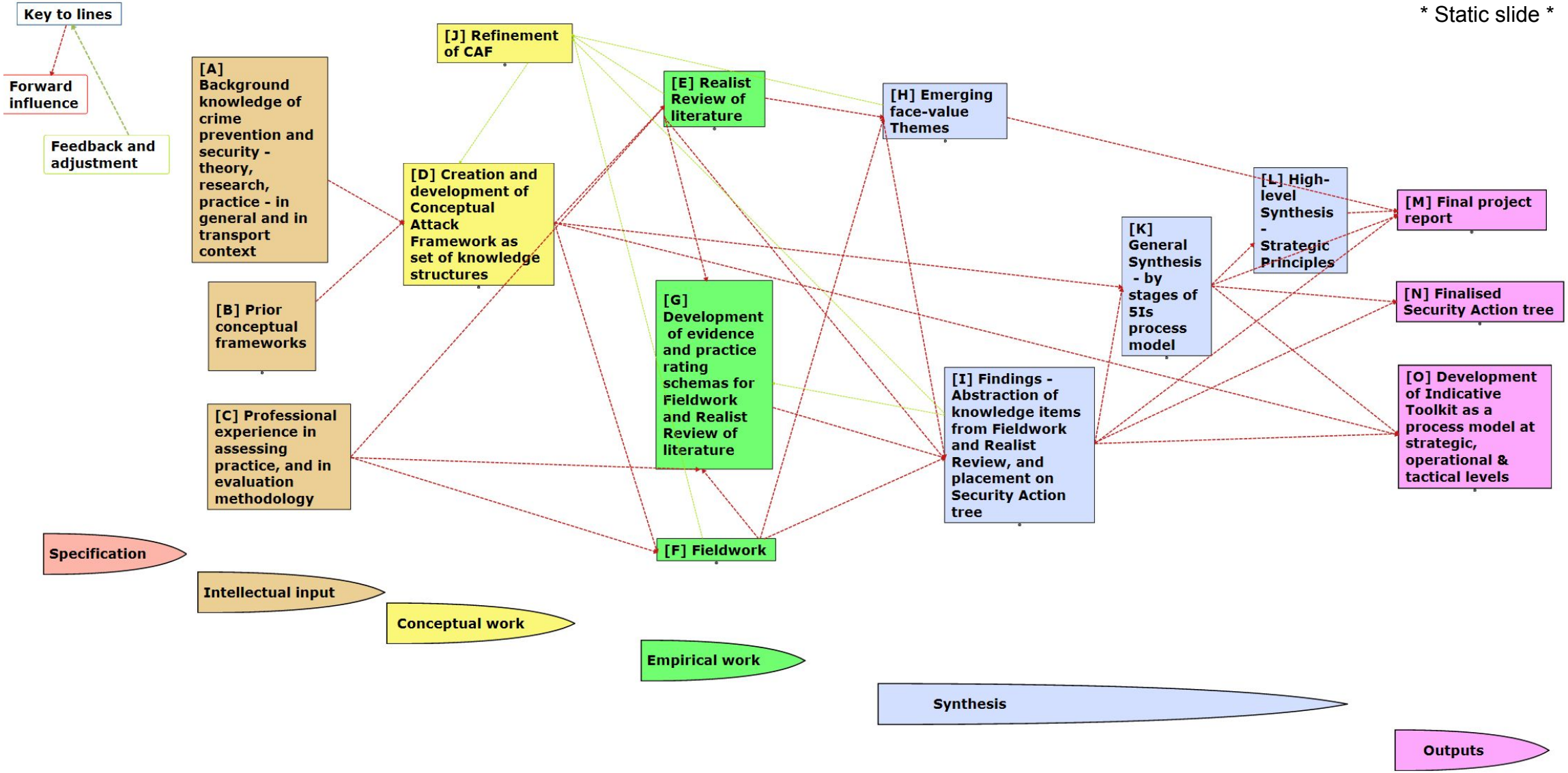

Toolkit approach

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- **The approach to the toolkit was to develop a process which empowers users to:**
  - Think **perpetrator**, and think **threat**
  - Think **risk** for terrorism/crime, generated by threat X design and operation of the station
  - Think **security** – prevention and first response (Protect and Prepare)
  - Think **designer**, and the wider requirements for business, users and society
  - Think **manager**
  - Think **future** – resilience and adaptability in the longer term
- Toolkit had to be adaptable to diverse user levels, contexts, functions

Indicative toolkit realisation

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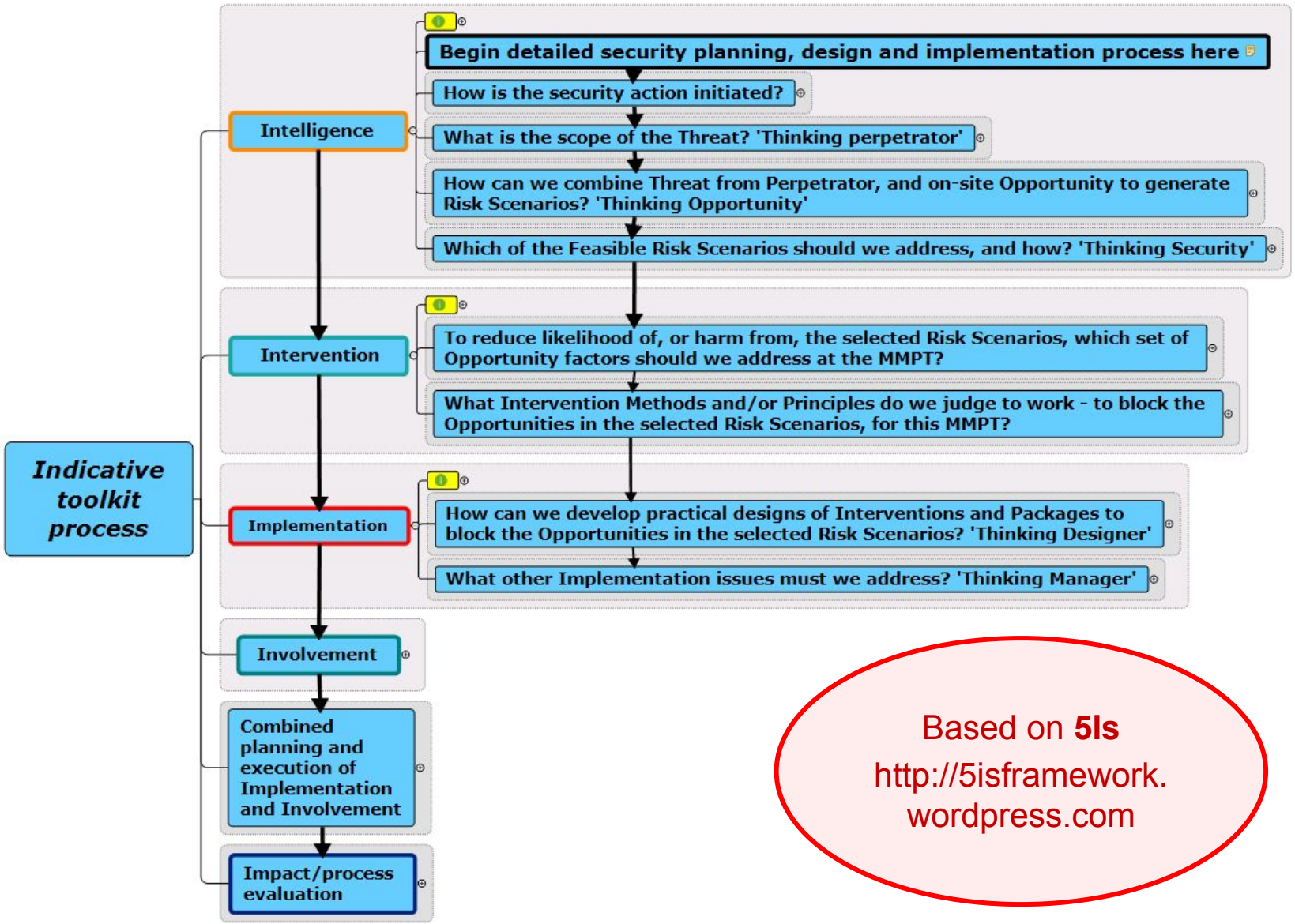
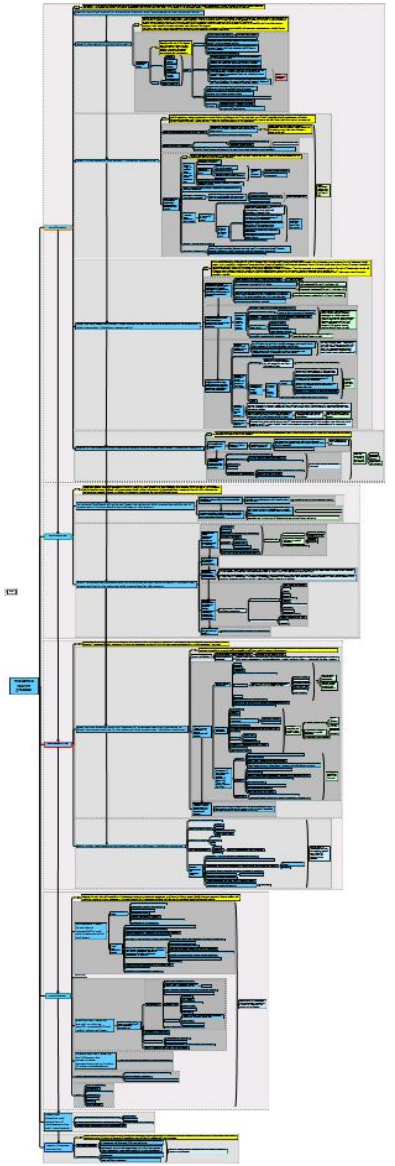


Based on **5Is**
http://5isframework.wordpress.com



Synthesis at policy level: General Principles recommended for a Pan-EU Land Transportation Security Strategy for MMPTs

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1. Adopt standardised EU-level definitions of all terms relating to security at MMPTs
2. Set up holistic governance structures & partnership working arrangements at MMPTs
3. Implement basic interventions for physical protection and harm mitigation at MMPTs
4. Manage and control the movement of people using MMPTs
5. Maximise opportunities to conduct effective surveillance at MMPTs
6. Ensure security approaches & interventions are appropriate for MMPT site and context
7. Provide Training of staff working at MMPTs
8. Strike a balance between the need for security and other priorities at MMPTs

Pre-Empt Phase 2 (2017-18) – Toolkit Extension and Realisation

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- As per Indicative Toolkit but:
  - Fully interactive
  - Terrorism PLUS multiple crime types typical of stations
  - In 15 EU languages
  - Adding local regulatory context
  - In 11 months

At the Heart of the Toolkit: Reducing risk by matching security actions to the threat

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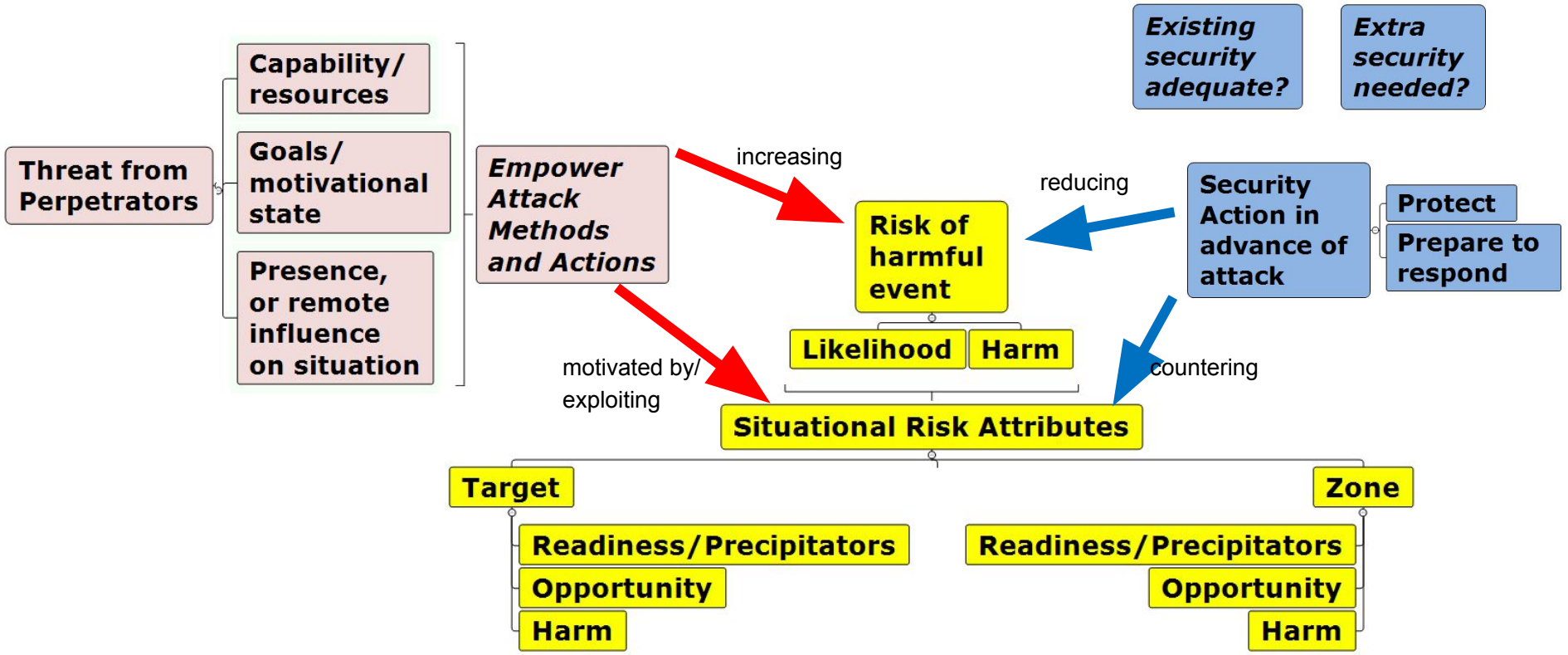
At the Heart of the Toolkit: Reducing risk by matching security actions to the threat



Risk Assessment done on a single **Attack Method at a time,** x **Zone-by-Zone** across station

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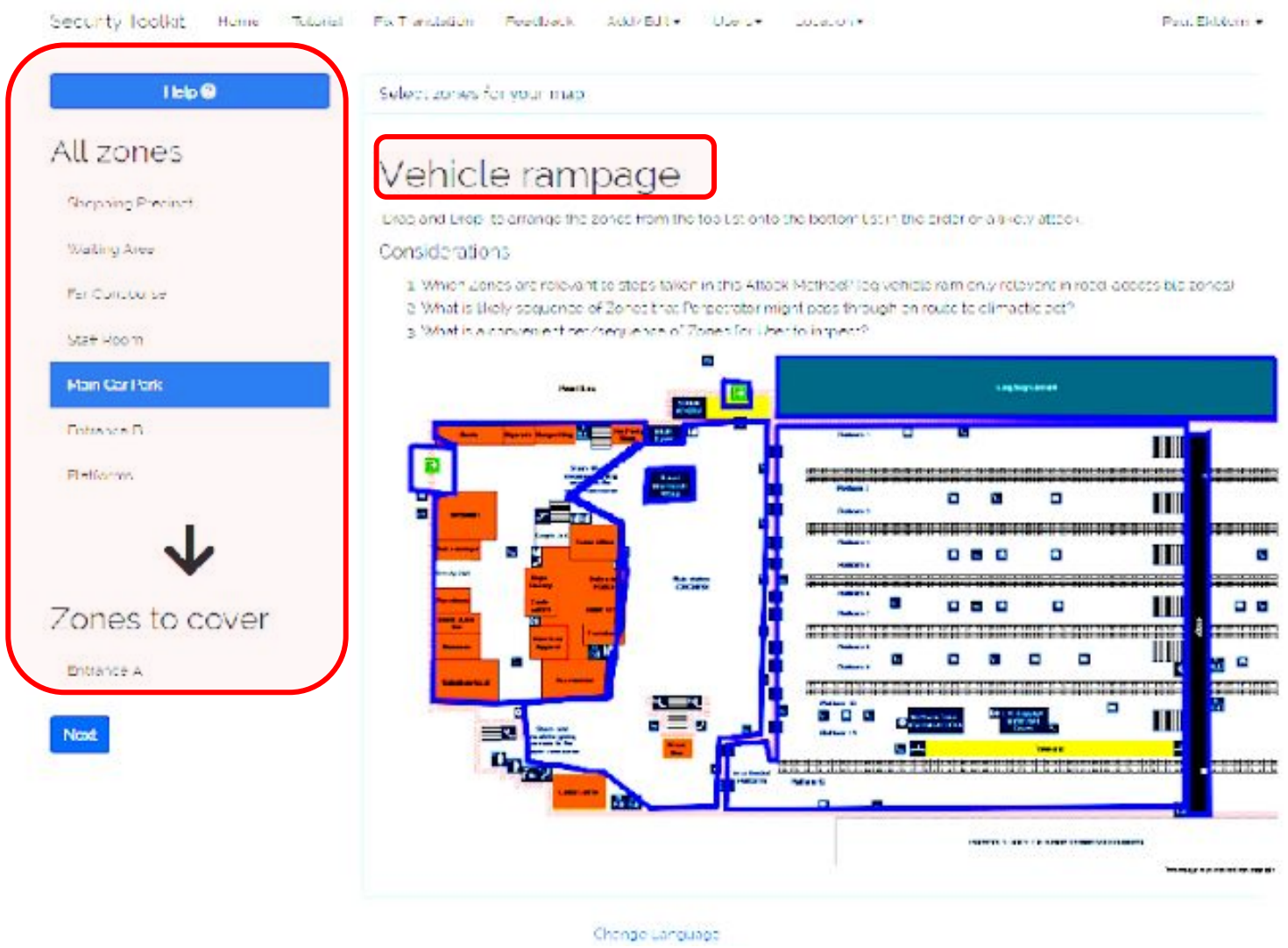
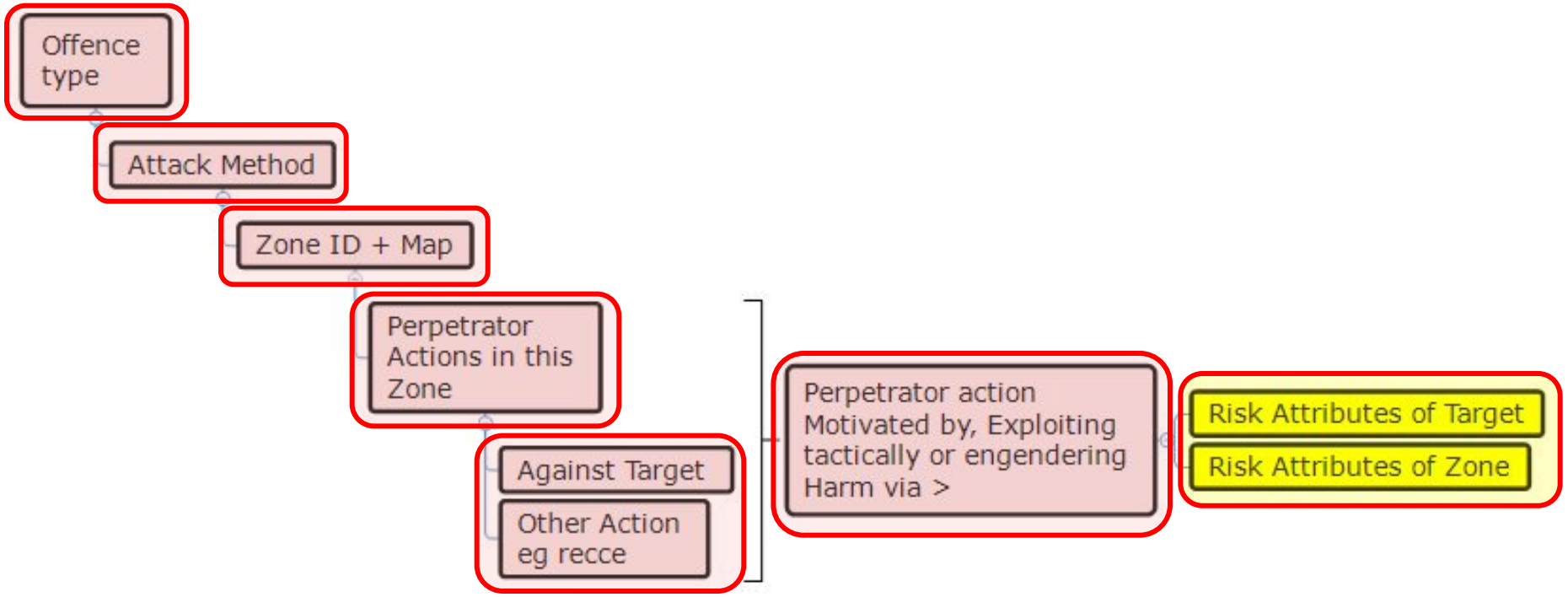
- Users focus on a single **Attack Method** at a time
- Users can create **Zones** within the station that are relevant to this Attack Method, and work through these in sequence



What is the Threat? Think Perpetrator



In more detail – Threat – the underlying lists pre-prepared for user

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- Offence type
  - Terrorism
  - Other offences...
- Attack Method
  - Vehicle rampage
  - Other methods...
- Specific Zone ID + Map link

- Perpetrator Actions in this Zone
  - Approach Zone boundary in vehicle → Main approach road
  - Orientation - seek immediate route to Zone boundary/ entry point, or to exterior target itself eg queue waiting to enter Zone → Taxi set-down lane
  - Enter Zone
    - Encroachment - negotiate barriers
    - Encroachment - tailgating preceding vehicle
    - Penetration - smashing through barrier
    - Deception at access control point - credentials
    - Deception at access control point - driver under duress
    - Duress - threat to access control staff
  - Align/ aim vehicle
  - Accelerate vehicle towards tactical or climactic Target
  - Negotiate bends/barriers inside Zone
  - Break through barriers/ other obstacles inside Zone
  - Attack climactic Target - run over pedestrians, ram material asset
  - Attack amplification - Vehicle blocks approach roads (thwarting escape of victims, access for security/ emergency services)
  - Vehicle continues to adjacent Zone
  - Other - enter free text
- Against Target Category -- instance
  - Passengers/visitors - as queue -- at external ticket machines
  - Other Target cats/instances...
- Undertaken where in this Zone [separate from Target as the action might not have a target, eg with Recce]
  - Periphery -- Outside entrance #12 [category + free text]
  - Other locations/ elements within this Zone...
- Perpetrator action Motivated by, Exploiting tactically or engendering Harm via >
  - Risk Attributes of Target
  - Risk Attributes of Zone

Realisation

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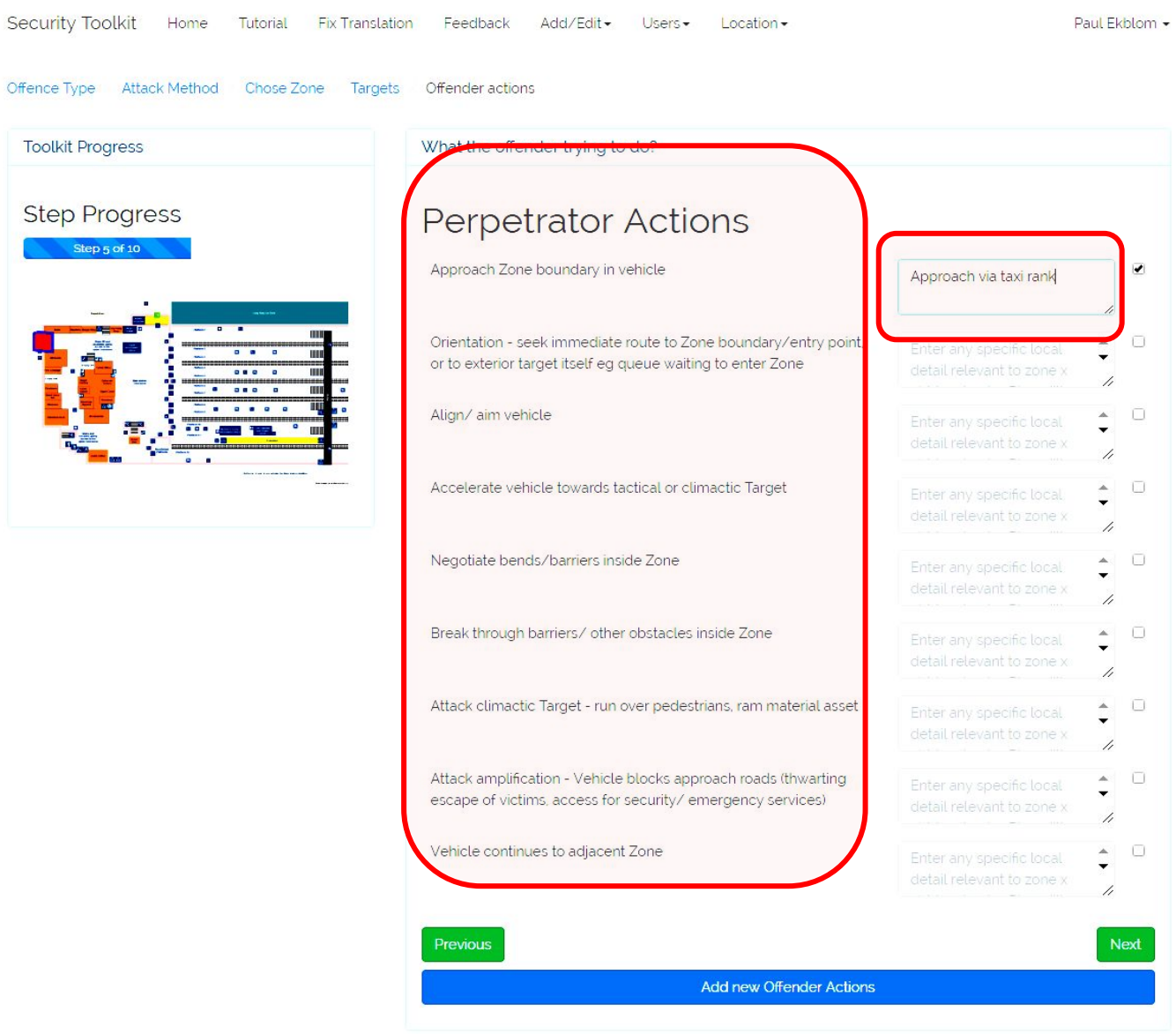
- Toolkit prompts user with **categories** of Perpetrator action
- User responds by entering a local **instantiation** of the action



In more detail – Risk attributes of human Targets located in Zone 'Entrance A'

Realisation – Zone Risk Attributes

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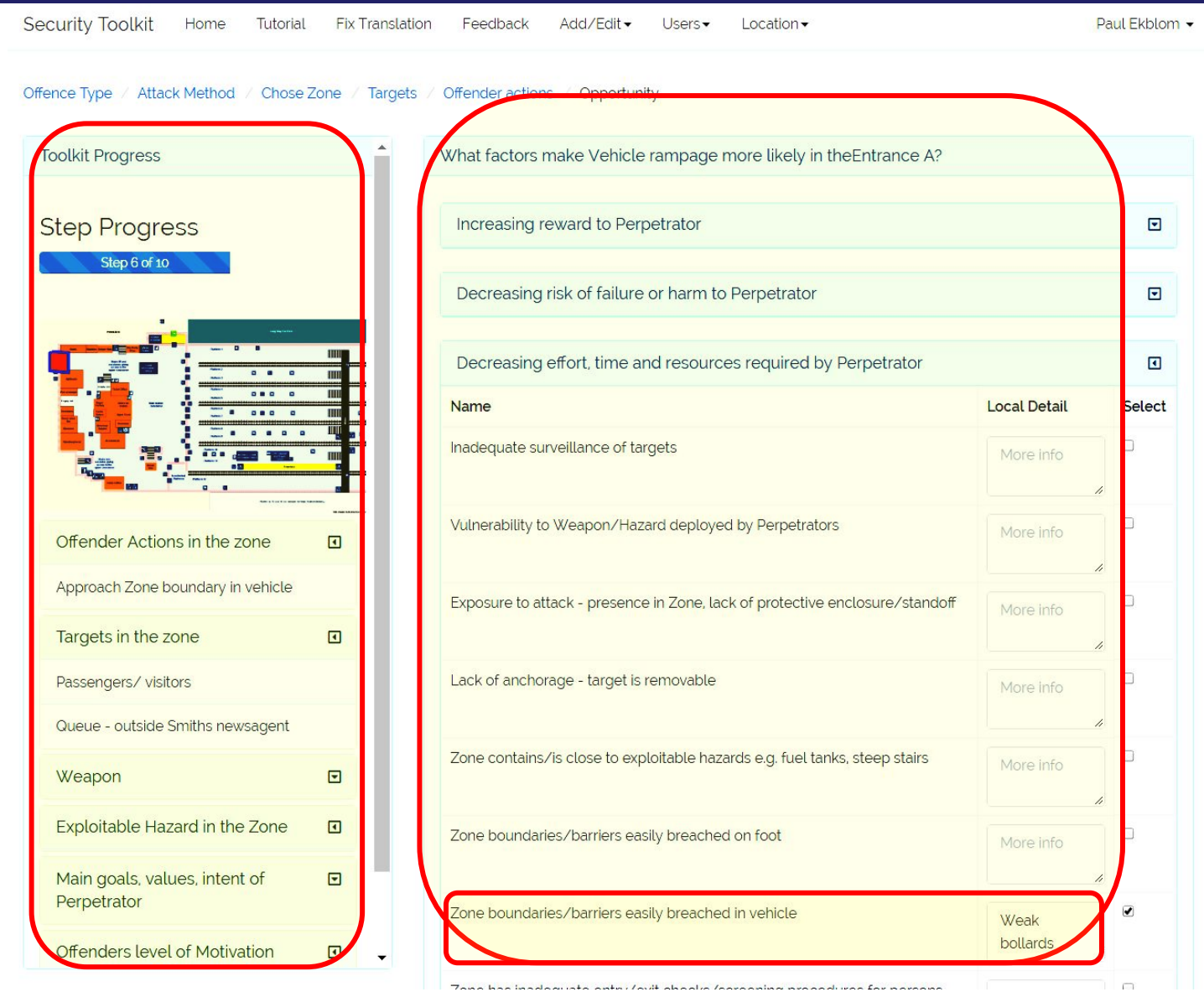
- This records user's choices in **planning for Offender's actions, targets, weapons, exploitable hazards; intent and level of motivation**
- This presents list of pre-prepared **risk attributes of Target & Zone**, for the **Attack Method** in question – user checks those which apply
- and fills in box with local detail



In more detail – Security Actions to counter the identified Risk Attributes

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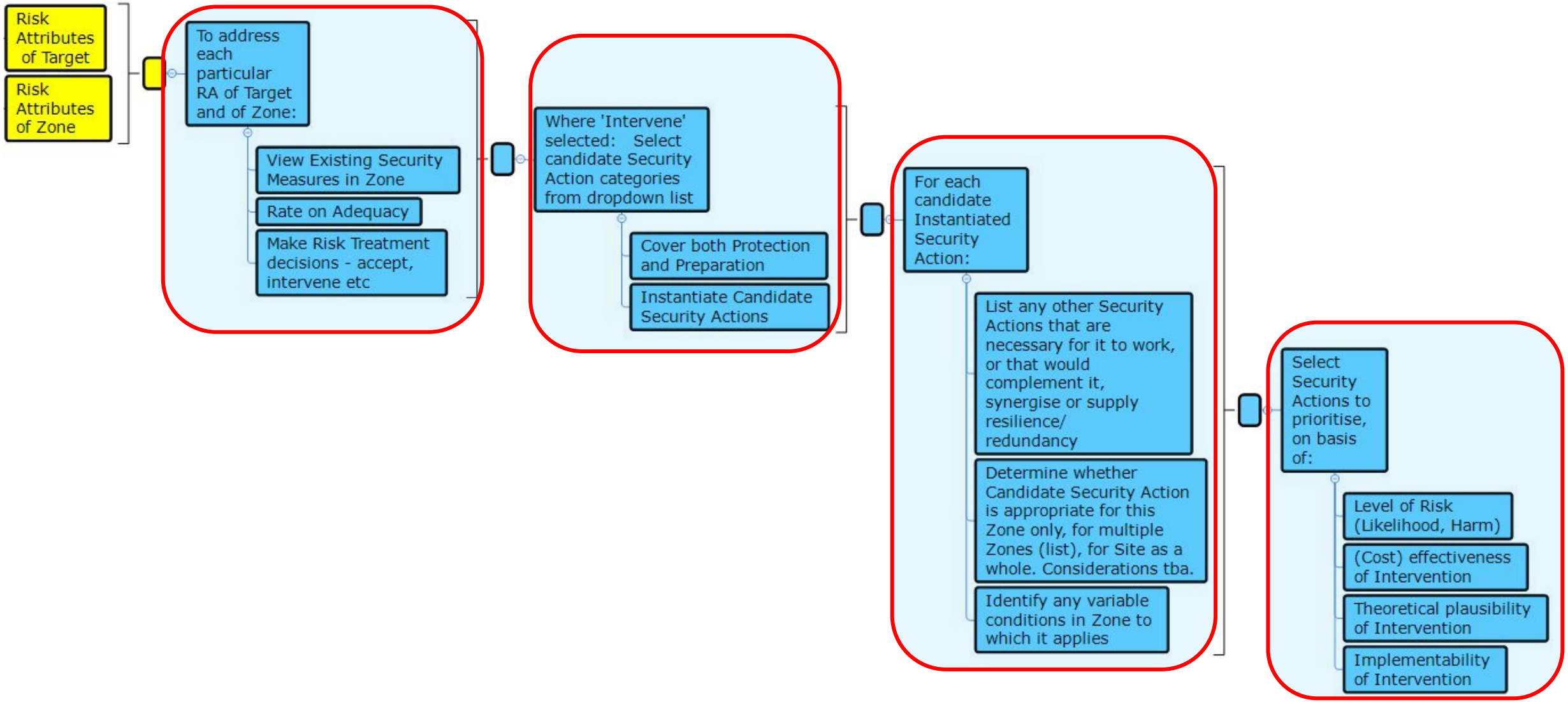
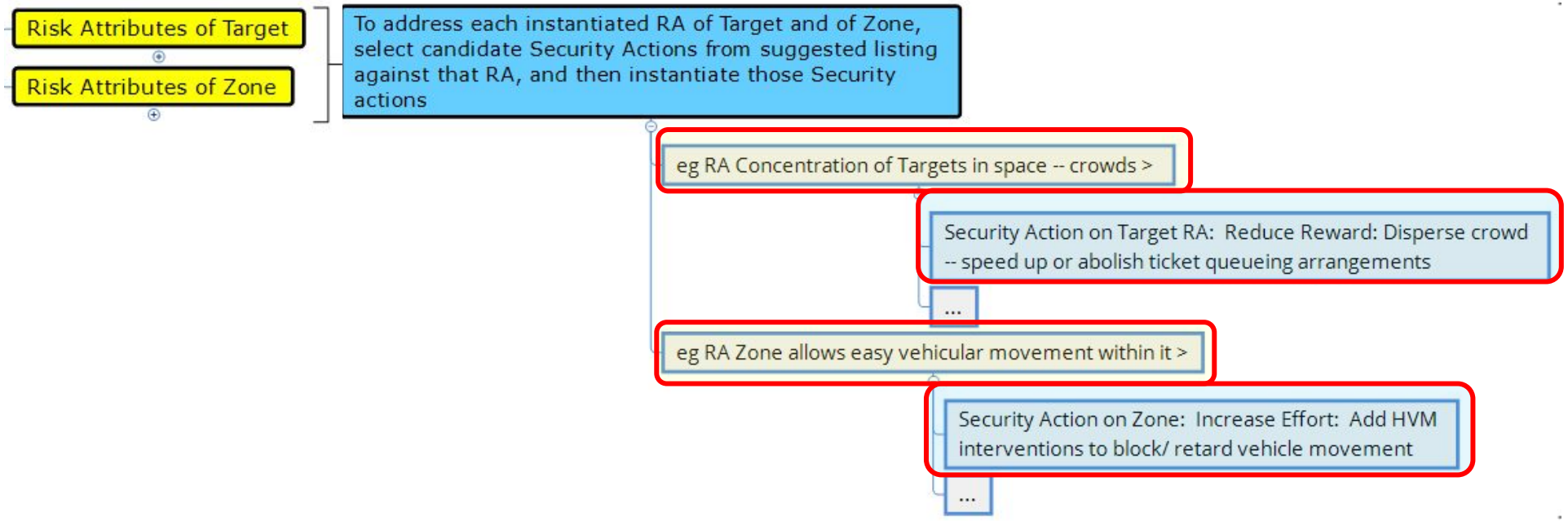


Example – Instantiated Security Actions to counter instantiated Risk Attributes



Realisation – Selecting/ instantiating candidate Security Actions on basis of risk attributes, and existing security measures, in Zone

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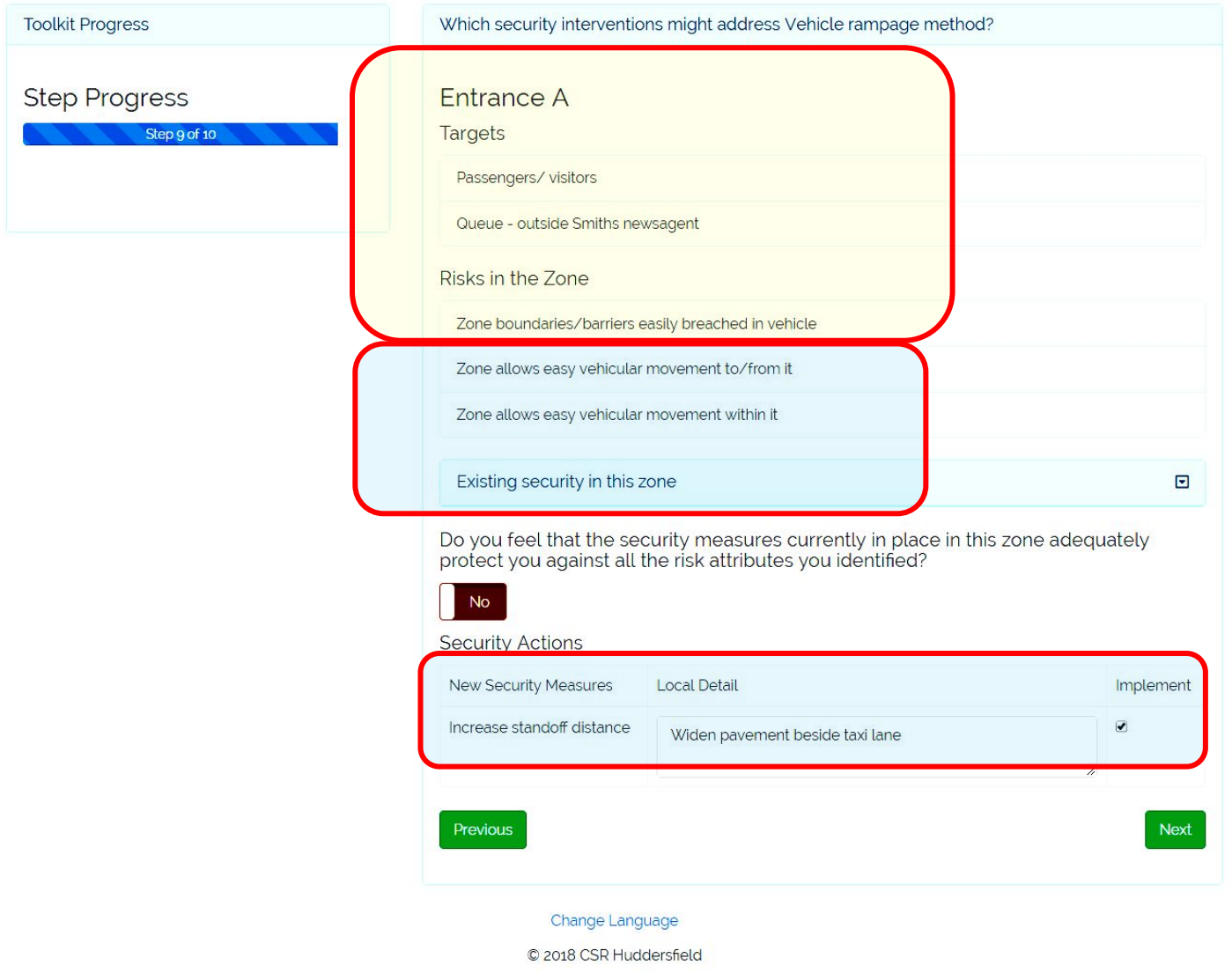

Realisation – Summary of user choices

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Security Toolkit | Home | Tutorial | Fix Translation | Feedback | Add/Edit | Users | Location

Session Overview

Review all your sections

Crime Type

Terrorist Attack

Vehicle rampage

Entrance A

Targets

- **Passengers/ visitors** -
- **Queue - outside Smiths newsagent** -

Perpetrator Actions

- **Approach Zone boundary in vehicle** - Approach via taxi rank

Risk attributes

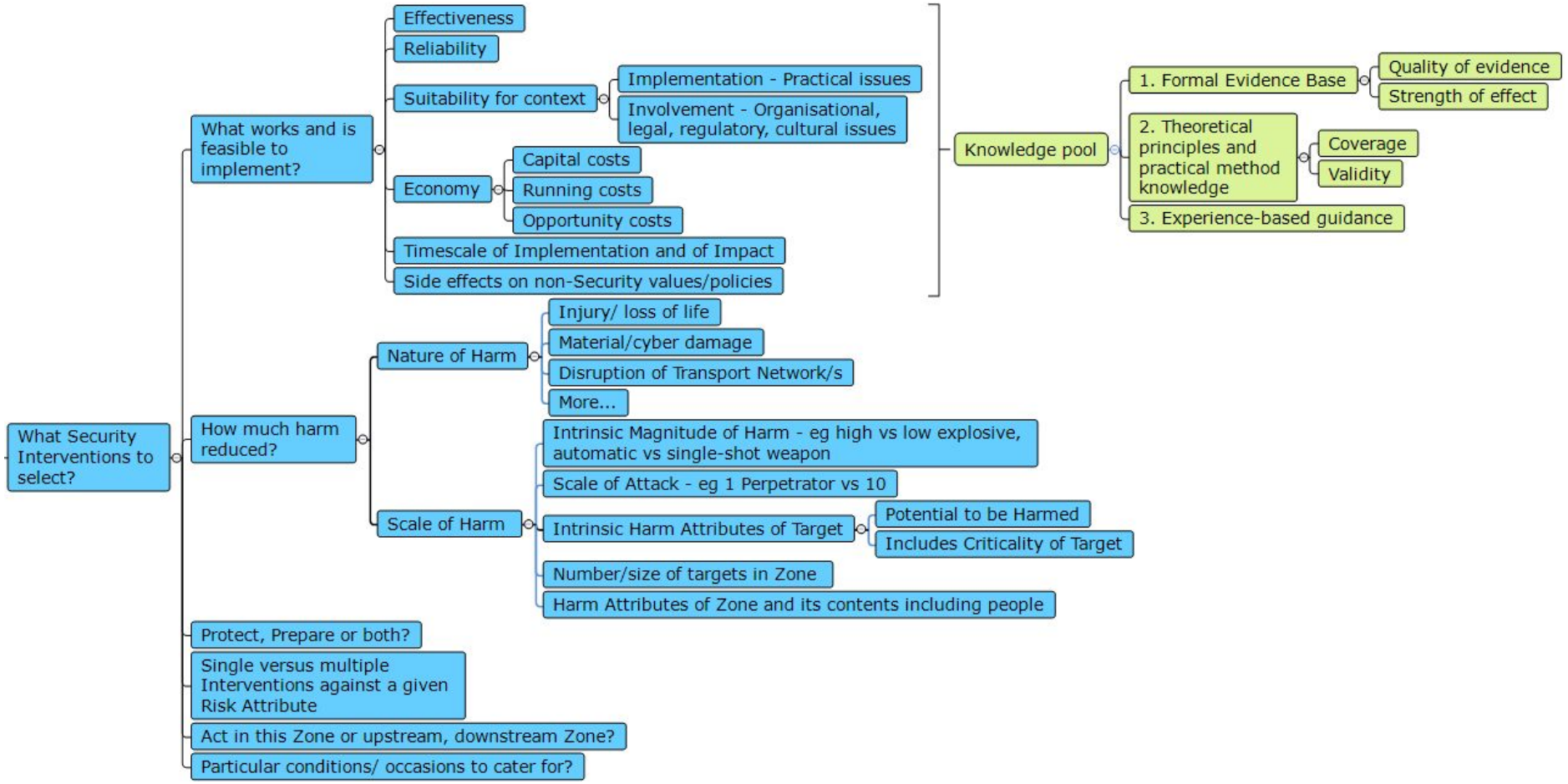
- **Zone boundaries/barriers easily breached in vehicle** - Weak bollards
- **Zone allows easy vehicular movement to/from it** - Easy access from taxi lane
- **Zone allows easy vehicular movement within it** - Low kerbs easily surmounted

Security Action

- **Increase standoff distance** - 1. Add bollards beside taxi lane 2. Raise kerb beside taxi lane approach

Selecting security actions to implement

Selecting security actions to implement



Screenshots of actual toolkit – setting up station map – defining zones and entering icons of facilities

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All zones

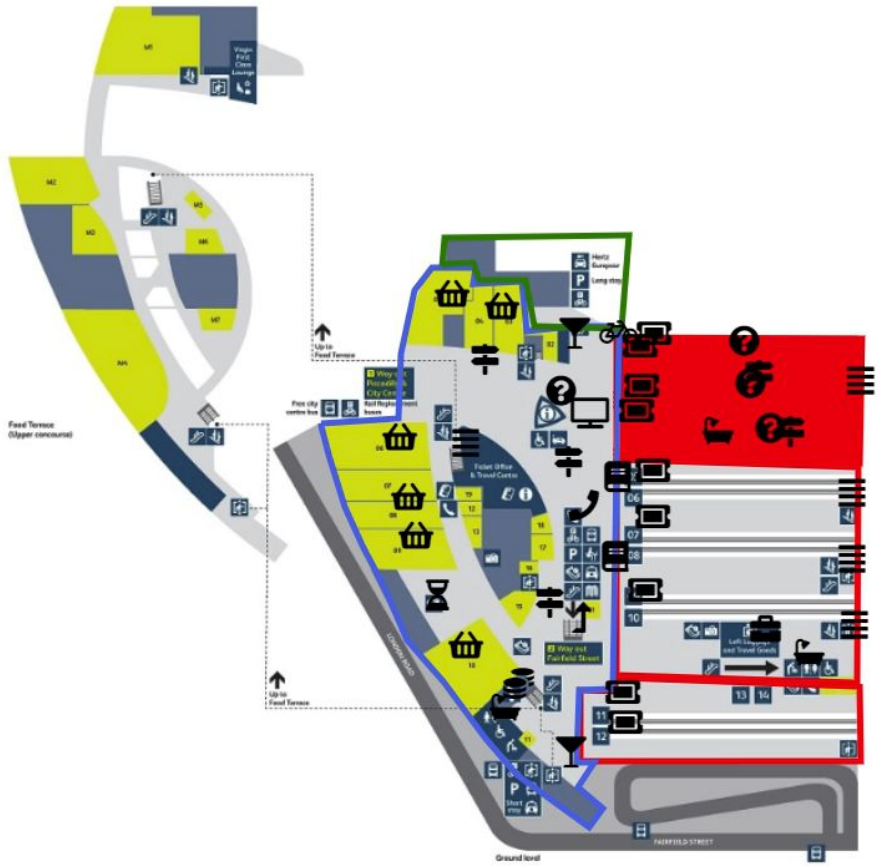
- Platforms 1-4
- Platforms 6-10
- Platforms 11-14
- Long Stay 1

Drag and Drop relevant zones below

- Main Foyer

Which Zones are relevant to *'Hostile vehicle'*?

Main Site | Upper Foyer | Piccadilly Ground Floor



Previous

Save and Continue

Screenshots of actual toolkit – identifying actions that offender may take in support of attack method

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Offence Type / Attack Method / Zone / Targets / Offender actions

Toolkit Progress

Step Progress

Step 5 of 10

Main Site → Main Foyer

What specific actions might the offender try to do in *'Main Foyer'*?

'When approaching the zone'

Name	Local Detail	Select
Orientate towards entrance	Enter any specific local detail relevant to zone 'Main Foyer' in 'Manchester Picadilly'.	☑
Disguise self (e.g. cover face with hooded top)	Enter any specific local detail relevant to zone 'Main Foyer' in 'Manchester Picadilly'.	☐
Accelerate towards entrance	Enter any specific local detail relevant to zone 'Main Foyer' in 'Manchester Picadilly'.	☐
Attack target on boundary zone	Enter any specific local detail relevant to zone 'Main Foyer' in 'Manchester Picadilly'.	☐
Identify obstacles to entrance	Enter any specific local detail relevant to zone 'Main Foyer' in 'Manchester Picadilly'.	☐

'When attempting to enter the zone'

'When inside the zone'

'When exiting the zone'

Is it likely the offender will carry a weapon that they will use in this zone?

Screenshots of actual toolkit – Identifying risk attributes in the Zone

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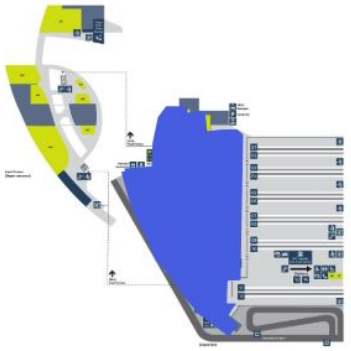
Offence Type / Attack Method / Zone / Targets / Offender actions / Opportunity

Toolkit Progress

Step Progress

Step 6 of 10



Main Site → Main Foyer

- Offender Actions in the zone
- Weapon used in the Zone
- Offenders method of travel within the zone

What factors make *'Hostile vehicle'* more likely in the *'Main Foyer'*?

Increasing reward to Offender

Name	Local Detail	Select
Zone is of symbolic/iconic value to Perpetrator	Enter any specific local detail relevant to zone 'Main Foyer' in	☐
Zone itself is an attractive/vulnerable target	Enter any specific local detail relevant to zone 'Main Foyer' in	☐
Zone contains many attractive/vulnerable targets	XXX	☑
The zone has a high flow rate of targets over time (e.g. vehicle flow or pedestrian footfall)	Enter any specific local detail relevant to zone 'Main Foyer' in	☑
Potential targets are concentrated in space (crowds, queues, departure boards)	Enter any specific local detail relevant to zone 'Main Foyer' in	☐

- Decreasing risk of failure or harm to Offender
- Decreasing effort, time and resources required by Offender

Previous | Save and Continue

Change Language

Screenshots of actual toolkit – selecting security actions from menu based on quality assessment/evidence of known interventions

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Toolkit Progress

Step Progress

Step 9 of 10

Do you feel that the security measures currently in place in this zone adequately protect the Zone, and if applicable the whole Site, against all the risks and harms you identified?

No

Security Actions

New Security Interventions	Who is responsible for the planning and implementation of this?	?
Modify queueing procedures	stationmanager@p	☑
Enter any specific local detail relevant to Manchester Picadilly.	★★☆☆ Recognised good practice - Research evidence unavailable	
Relocate hazards to less harmful location	example@example.com	☐
Enter any specific local detail relevant to Manchester Picadilly.	★★☆☆ Recognised good practice - Research evidence unavailable	
Disperse targets in time/ space	example@example.com	☐
Enter any specific local detail relevant to Manchester Picadilly.	★★☆☆ Recognised good practice - Research evidence unavailable	
Modify traffic flows and crowding pinch-points through design of layout and procedures	example@example.com	☐
Enter any specific local detail relevant to Manchester Picadilly.	★★☆☆ Recognised good practice - Research evidence unavailable	
Improve procedures/ facilities to make compliance with security	example@example.com	☐

Screenshots of actual toolkit – output summary of session – One offence: terrorism; one attack method: hostile vehicle; one Zone; multiple actions by offender; multiple risk attributes of zone; multiple security actions aimed at controlling the risk attributes

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Toolkit Progress

Step Progress

Step 10 of 10

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Remind me on...

« April 2019 »

	Su	Mo	Tu	We	Th	Fr	Sa
14	31	1	2	3	4	5	6
15	7	8	9	10	11	12	13
16	14	15	16	17	18	19	20
17	21	22	23	24	25	26	27
18	28	29	30	1	2	3	4
19	5	6	7	8	9	10	11

Today

Clear

Session Summary

This paper presents a summary of all the information entered into this session of the toolkit.

When planning and implementing the recommended security actions please consider the following:

- Local and national policies, laws and regulations
- The needs of local users such as passengers and staff
- Business requirements of local operators and on site retail
- Potential conflict with existing security measures

This assessment has been completed for **'Terrorism'** and for **'Hostile vehicle'**.

The identified risks for zone **'Main Foyer'** are:

- Zone contains many attractive/vulnerable targets - *XXX*
- The zone has a high flow rate of targets over time (e.g. vehicle flow or pedestrian footfall) - *8.00-10am*
- Potential targets are concentrated in space (crowds, queues, departure boards) - *XXX*
- Zone has insufficient/ inadequate places of shelter, invacuation
- Zone has insufficient/inadequate evacuation/ escape routes
- Zone allows easy vehicle movement to/from it
- Zone allows easy vehicle movement within it
- Zone boundaries/barriers easily breached in vehicle
- Multiple injuries to persons - *XXX*
- Crowds (surges/panic/crush)
- Weaponisation - e.g. shrapnel, starting a fire, toxic gas release
- Structural building collapse
- Electrical hazards - *XX*
- Glass fragments - *XX*
- Flammable/Combustible materials - heat, smoke, toxic fumes, structural damage, panic - *XXX*
- Entrapment/lack of escape or evacuation
- Inadequate emergency lighting
- Susceptibility to general damage
- Inadequate emergency signage/ communications

These risks apply to the following users and features in the zone:

- Contractors
- Security guards
- Passengers
- Visitors

Features

- Help points - *Congregation at XXX*
- Timetable display board - *Congregation at XXX*
- Stairs/Elevator - *Congregation at XXX*

These risks are caused by the following Offender Actions:

- Orientate towards entrance - *XXX*
- Accelerate towards entrance
- Enter Zone via Force - breaking through enclosure/barriers - *XXX*
- Align/ aim vehicle
- Accelerate vehicle towards tactical target (or adjacent zone) - *X*
- Negotiate bends/barriers inside Zone - *X*
- Locate Target - *XXX*
- Attack final target - *Entrance to Platforms 1-4*

Weapons

Using the weapons listed below:

- Firearms
- Vehicle itself used as weapon

Travel

The offenders may travel using:

- Sports Utility Vehicle/Multi Person Vehicle
- Large van or Truck/HGV

You have chosen to say that the security actions at your site are not adequate, so the toolkit has recommended the following security interventions:

- Modify queueing procedures - *XXX* stationmanager@picadilly.com
- Disperse targets in time/ space - *XXX*
- Modify traffic flows and crowding pinch-points through design of layout and procedures - *XXX* groundfloormanager@picadilly.com
- Improve hostile vehicle mitigation measures - (eg barriers/ bollards, physical markers) - *Install barriers at entrance 2 and between shops X and X*
- Improve evacuation facilities/ procedures
- Regular drills of evacuation and response procedures

Us when project finished

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