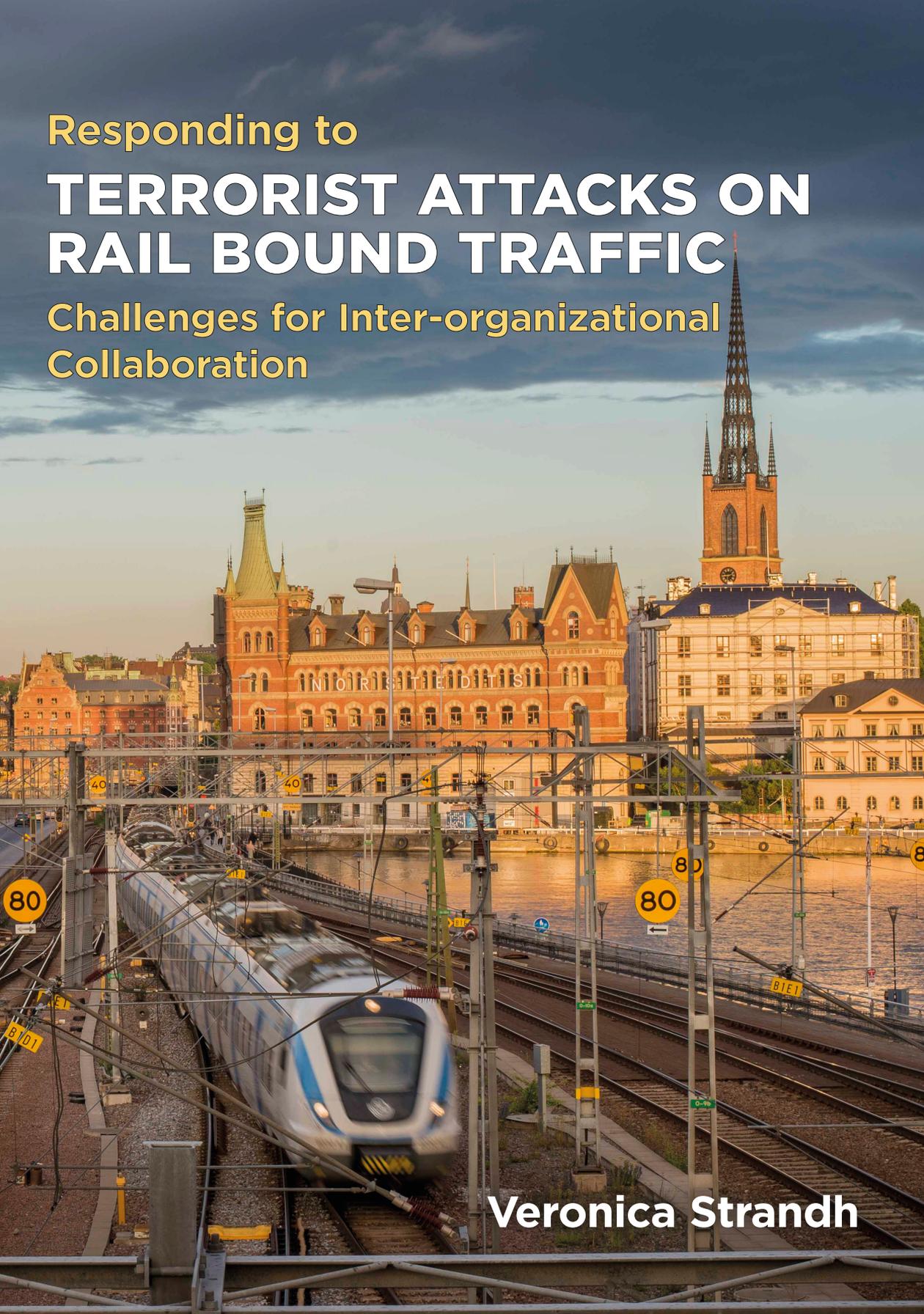


Responding to

TERRORIST ATTACKS ON RAIL BOUND TRAFFIC

Challenges for Inter-organizational
Collaboration



Veronica Strandh

Responding to Terrorist Attacks on Rail Bound Traffic

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Collaboration

Veronica Strandh



**Department of Political Science &
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To Andreas

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List of papers

- I. Strandberg, Veronica (2013) 'Rail Bound Traffic—a Prime Target for Contemporary Terrorist Attacks?', *Journal of Transportation Security*, 6 (3): 271–286.
- II. Strandh, Veronica (2015) 'Preparing and Responding to Mass Casualty Terrorist Attacks – a Comparative Analysis of Four Terrorist Attacks Targeting Rail Bound Traffic', *International Journal of Emergency Management*, 11(3): 262-281.
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Abstract

Contemporary terrorism is becoming increasingly indiscriminate, and rail bound traffic appears to be vulnerable and at high risk for terrorist attacks. An attack targeting a train or subway system can have enormous implications, both in terms of human suffering and long-term societal consequences. This dissertation aims to analyze how public and private organizations prepare for and respond to crises emanating from terrorism targeting rail bound traffic. It also examines different practices, networks and ideas related to inter-organizational collaboration. Contemporary research emphasizes the importance and advantages of collaborative action in crisis management, and the idea of inter-organizational collaboration is also embedded in policy documents and has support among practitioners. Despite this, inter-organizational collaboration often turns out to be difficult in practice, and it stands out as a critical factor in many crisis situations. Hence, it is crucial to identify and better understand the challenges associated with inter-organizational collaboration in the context of terrorist-induced crises. This dissertation is a contribution to this endeavor. In order to capture the inherent complexity of the topic this dissertation combines and merges literature from three research fields: crisis management research, disaster medicine research and terrorism studies.

The dissertation examines international experiences of terrorist attacks directed against rail bound traffic. It identifies the way in which attacks have changed over time and analyzes the main challenges of providing pre-hospital care following a mass-casualty attack. In addition, Sweden is used to provide empirical focus in an analysis of preparedness. Relying on scenario-based interviews with central crisis management actors and actors from rail bound traffic, current preparedness practices for responding to a multi-site terrorist attack on rail bound traffic in Sweden is analyzed. The research shows that both public and private organizations have developed risk awareness about terrorist-induced crises. However, their preparedness practices are characterized by significant variations and substantial uncertainty. Scarcity of resources are a critical factor, and actors find it difficult to invest in preparedness for seldom-occurring crises. This difficulty is accentuated by the fact that no major mass-casualty attack has taken place in Sweden. A terrorist attack differs from a routine event and poses new and different challenges for inter-organizational collaboration. A large number of organizations are supposed to work together under severe time constraints, and their work can be delayed by particular security concerns. It is assumed that rail bound traffic actors engage in collaborative crisis management; however, there appear to be few mechanisms to prepare them, in a systematic way, for managing this

particular type of crisis. Among actors, inter-organizational collaboration is understood primarily from a normative view rather than from the point of view of its practical meaning. As a consequence, it is difficult to turn risk awareness and a commitment to working together into actual practical action. In addition, collaboration between different levels in the crisis management system is particularly challenging. This dissertation also identifies a tension between viewing crisis management as an example of policy-as-usual or from a crises-as-exceptions perspective.

Keywords: crisis management, terrorism, rail bound traffic, inter-organizational collaboration, disaster medicine, scenario-based planning, preparedness, response, security

Sammanfattning

Dagens terrorism blir alltmer urskillningslös och spårbunden trafik anses vara ytterst sårbar för terroristattentat. Ett terroristdåd riktat mot ett tåg eller ett tunnelbanesystem kan få enorma konsekvenser, både i termer av mänskligt lidande och genom dess stora samhällspåverkan. Denna avhandling syftar till att analysera offentliga och privata aktörers beredskap och förmåga att hantera kriser orsakade av terrorism riktat mot spårbunden trafik. Vidare är syftet att undersöka samverkan mellan olika aktörer, dess olika nätverk och idéer om hur samverkan uppnås. Vikten av samverkan i krishantering lyfts ofta fram i forskningen. Antaganden om samverkans positiva inverkan betonas även i olika policydokument och lyfts fram av krishanteringspraktiker. I praktiken förefaller dock effektiv samverkan vara omgärdad av svårigheter och utmaningar, inte sällan framkommer just samverkan som den mest kritiska punkten i hanterandet av en kris. Det är därför av vikt att även få en fördjupad förståelse av samverkans olika utmaningar i händelse av ett terroristattentat. Denna avhandling utgör därför ett viktigt bidrag. För att fånga ämnets inneboende komplexitet kombineras forskningslitteratur från tre olika fält; krishanteringsforskning, forskning om katastrofmedicin och terrorism studier.

Avhandlingen undersöker internationella erfarenheter av terroristattentat riktade mot spårbunden trafik. Hur terroristattentat mot denna sektor har förändrats över tid analyseras liksom internationella erfarenheter av prehospital vård i samband med masskadeattacker. Sverige utgör avhandlingens huvudsakliga empiriska fokus. Scenario-baserade intervjuer med centrala krishanteringsaktörer och aktörer från spårbunden trafik används för att studera svensk beredskap inför ett storskaligt terroristattentat mot spårbunden trafik. Avhandlingen visar att både offentliga och privata aktörer idag har en större riskmedvetenhet vad gäller terrorism. Dock präglas deras faktiska beredskap av stora variationer och en betydande osäkerhet. Framförallt är bristande resurser en kritisk faktor och aktörer anser att det är svårt att investera tid och resurser i beredskap inför kriser som sällan inträffar. Denna svårighet förstärks av att Sverige har varit förskonat från terroristattentat med svåra masskadesituationer som följd. Ett terroristattentat skiljer sig markant från en rutinhändelse och ger upphov till nya utmaningar för samverkan. Framförallt antas ett stort antal aktörer med olika mandat och roller arbeta effektivt under extrem tidspress. I händelse av ett attentat kan hanteringen komma att försenas av olika typer av säkerhetsrisker. Vidare antas tågaktörer ha en aktiv roll i krishantering, dock är det idag få mekanismer som förbereder dem på ett systematiskt sätt inför denna specifika typ av kris. Avhandlingen visar att aktörer tenderar att förstå

begreppet samverkan framförallt utifrån dess normativa aspekt snarare än utifrån dess praktiska betydelse. Detta leder till en upplevelse av att viljan att samverka kan vara svår att omsätta till handling. Vidare upplevs samverkan mellan olika nivåer i krishanteringssystemet vara en utmaning. Avhandlingen identifierar även att det finns en spänning mellan att se krishantering som ett föremål för vardagspolicy och att se det som ett policyområde utöver det vanliga.

Nyckelord: krishantering, terrorism, spårbundentrafik, samverkan, katastrofmedicin, scenario-baserad planering, beredskap, respons, säkerhet

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I began working on this dissertation nearly five years ago. At the time, I could not even imagine how it would feel to hold a final manuscript in my hands. It seemed like an unattainable goal. Yet, today, I sit here writing the last words of my dissertation. It is a feeling that I will remember for a long time, and a moment I will be proud of. The process of writing this dissertation has, without doubt, been an adventure, one with both ups and downs. However, when I recall all the inspiring and exciting meetings with people along the way, the interesting discussions, travels, interviews and conferences, the moments of joy shine through, and I feel privileged to have had the chance to take this journey.

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Veronica Strandh

Umeå, July 2015

List of abbreviations

ASTOC	Association of Swedish Train Operating Companies
CAB	Country Administrative Board
CBRNE	Chemical, Biological, Radioactive, Nuclear, Explosive substances
DRC	Disaster Research Center
GTD	Global Terrorism Database
ICAO	International Civil Aviation Organization
IED	Improvised explosive device
MSB	Swedish Civil Contingencies Agency
SOU	Swedish Government Official Reports
START	National Consortium for the Study of Terrorism and Responses to Terrorism
SÄPO	Swedish Security Service
UN	United Nations

1. Introduction

This dissertation revolves around a specific type of crisis, namely terrorist attacks targeting rail bound traffic. The overarching purpose is to analyze how public and private organizations prepare for and respond to crises emanating from terrorism targeting rail bound traffic. An effort is made to unravel and discuss different practices, networks and the development of ideas about inter-organizational collaboration. Empirically driven, the dissertation's point of departure is the observation that the scope and scale of terrorist attacks targeting rail bound traffic are changing globally. A general development in present day terrorism is an identifiable shift towards more indiscriminate killings. In the eyes of terrorists, it seems that rail bound traffic is becoming a "perfect" target to attack when the goal is to cause mass-casualty events (Jenkins 2001, Plant 2004).

Sweden, which is an empirical focus in the dissertation, has yet to suffer a major terrorist attack on its rail bound traffic system. However, this does not imply that the country is immune to such extraordinary events. As stated in the comprehensive Swedish national counterterrorism strategy: "Attacks that were carried out and planned attacks that were thwarted have shown that there is a real risk of terrorist attacks in Sweden or against Swedish interests" (Skr. 2011/12:73, p. 3). In the past decade, the Nordic countries have experienced events that have shown that they are not immune to terror – for example, Sweden's first, but failed, suicide bombing in 2010, a thwarted terrorist attack on the Danish newspaper *Jyllands-Posten* in 2010 and Behring-Breivik's lone-wolf terrorist attack in Norway in 2011. In light of developments in Europe and following recent acts of terrorism in Paris 2015, the Swedish discussion about how to counter terrorism and manage the consequences of potential attacks continues to increase.

As this dissertation will show, developing and working with scenarios plays an important role when public and private actors come together and try to analyze their organizational response capacity and prepare for crisis situations (Donahue and Tuohy 2006, McConnell and Drennan 2006). For the purpose of illustration and to further introduce the specific type of crisis that will be examined in this dissertation, we can envisage the following terrorism *scenario* focused upon rail bound traffic.¹

¹The empirical focus of this dissertation is the Swedish case study, which builds on scenario-based interviews with key public and private organizations preparing for responding to terrorism targeting rail bound traffic. For a detailed discussion about the specific scenario and how it has been used, see section 6.4.2.

Imagine a terrorist attack that involves coordinated bombs exploding during the morning rush hour in Stockholm, the capital of Sweden. During the short timespan between 08.12-08.16, four bombs hidden in backpacks explode. The first bomb explodes on a passenger train while it is stopped at a platform at the central train station. A couple of minutes later, two subsequent explosions take place on a crowded subway train traveling between two downtown stations – Hötorget and Rådmanngatan. Thereafter, a fourth bomb explodes on an express train on its way to the international airport. The four bombs cause a complicated mass-casualty situation; there are 80 fatalities and more than 300 persons in need of medical care. First responders immediately initiate rescue efforts, trying to treat people and prevent loss of life. They operate in chaotic and uncertain environments with an overarching fear of further attacks, and as they respond, they must also deal with dire security concerns, both for themselves and for the victims.

Hundreds of injured are in need of medical care and rapid transport to different hospitals. A significant number of so-called walking wounded creates major pressure on hospitals in the area. Moreover, the attacks cause a complete shutdown of the transportation system, which leaves many people stranded without transportation. There is general unrest as the initial rescue effort takes place and people try to make sense of what is happening. The situation is particularly challenging because there are multiple incident sites. The acute situation unfolds rapidly, and it soon becomes apparent that extensive resources are needed in order to deal with the many casualties and extensive infrastructure damage. It also becomes clear that the crisis management response needs to be coordinated and requires management on a local, regional and national level.

Introducing a fictional scenario in which four bombs are used to target the train and subway systems in Stockholm serves the purpose of illustrating the truly *extraordinary* character of a terrorist event targeted at rail bound traffic.² Hence, we are looking at an extraordinary crisis that differs profoundly from a *routine emergency* (Comfort, Boin and Demchak 2010). Moreover, the extraordinary character of the scenario, with its many casualties and the need for management at different response levels, raises the

² An *extraordinary* crisis indicates that the event deviates from what is normal. It entails a serious disruption or imminent risk of a serious disruption of vital societal functions. Furthermore, it requires rapid action by a municipality or county council. See, for example, *Act on municipal and county council measures prior to and during extra-ordinary events in peacetime and during periods of heightened alert* (2006:544). However, it can also be noted that if we adopt a more subjective perspective on the meaning of an extraordinary crisis, the term *extraordinary* can be discussed further. What is perceived as extraordinary differs profoundly among organizations and, above all, across geographic locations. For instance, the resources that a capital city has to manage a mass-casualty situation is profoundly different from those available to smaller cities or rural areas.

question of what types of preparedness practices and response capacity Sweden has in place in order to respond to a crisis of this type and scale. This scenario will play a central role in the dissertation and, with the help of my empirically driven research, I will be able to return to the scenario and present a more comprehensive picture of how public and private organizations in Sweden are expected to be able to respond to a major terrorist-induced crisis.

Protecting citizens from harm and providing organized crisis response has traditionally been one of the core responsibilities of the state (Boin and Rhinard 2008, Comfort, Boin and Demchak 2010). Based on a first glance at the scenario of nearly simultaneous, multiple bombings in the Swedish capital, we can only speculate about the management challenges of responding. We know, however, that they are related to how public and private organizations engage in comprehensive *crisis management processes*, which, in this dissertation, is understood to mean how organizations *prevent*, *mitigate* and *prepare* before a crisis, *respond* during the crisis, and *recover* after it (Mileti 1999, McEntire 2007, Comfort, Boin and Demchak 2010, Coppola 2011). I will primarily use the term *crisis management* as an umbrella term. (Disaster management and emergency management are often used in the literature as roughly synonymous with crisis management).

What the scenario of multiple-bombings on rail bound traffic in Sweden points to is the need for *inter-organizational collaboration*. No single organization can manage this crisis alone. Even on a lesser scale, a successfully implemented terrorist attack like the one described here would seriously challenge not only public actors at the local, regional and national levels, but private actors as well. Hence, a crisis on this scale presumes rapid collaborative actions of a significant number of actors.

This raises the question of how Sweden can prepare for and respond to a terrorist attack on rail bound traffic? Inter-organizational collaboration appears to be the way forward in order to successfully manage complex threats and crises. In fact, inter-organizational collaboration – both as practical management action and as a scholarly concept – has gained an increasing amount of attention. Discussions about inter-organizational collaboration, and above all about its presumed benefits, are common. We can observe that the concept is frequently used by different crisis management actors; it is also embedded in government documents, and inter-organizational collaboration is a topic frequently researched by scholars.

If we start by looking at inter-organizational collaboration as *practical crisis management action*, we can observe how Sweden's capacity to respond to crises in a collaborative manner has been highlighted in collaborative exercises. The Samö exercise, which is the main forum for inter-organizational collaboration exercises in Sweden, focused on rail bound traffic in 2007. The evaluation report revealed several challenges relating to effective inter-organizational collaboration, and, in particular, the report included critical conclusions that pointed to a lack of experience in both information sharing and communication of threat assessments (Samö 2007 evaluation report: 9-20). Interestingly, since 2007 there has been no major follow-up exercise addressing this specific type of crisis – i.e. terrorism targeting rail bound traffic. However, it is clear that significant emphasis is directed at inter-organizational collaboration when public and private actors discuss preparedness for extraordinary events (MSB 2014). In fact, in the language of the agencies responsible for preventing and preparing for a terrorist attack on rail bound traffic – e.g. Swedish Security Service (Säpo) and the Swedish Civil Contingencies Agency (MSB) – inter-organizational collaboration is now a core concept. Clearly, the concept has influenced the everyday language used in Swedish crisis management circles: there are *collaboration* exercises, *collaboration* conferences, *collaboration* meetings, *collaborative* forums for crisis preparedness and coordinators for *collaboration*, to mention only a few examples.

Furthermore, as mentioned above, inter-organizational collaboration has become firmly embedded in *government documents*. Central documents such as government bills *Cooperation in emergency – for a more secure society* (2005/06:133) and *Stronger emergency preparedness – for safety's sake* (2007/08:92), and government communiqués *Society's crisis preparedness: strong collaboration for increased safety* (2009/10:124) and *Sweden's national counter-terrorism strategy*, (2011/12:73) all stress that Swedish crisis management is based on inter-organizational collaboration and that collaboration is a prerequisite for managing complex threats and crises such as terrorism.

When examining how Sweden prepares for a major terrorist attack on rail bound traffic, it is important to remember that the country has limited experience of terrorism-induced crises. Sweden suffered acts of terrorism in the 1970s, most notably the Bulltofta skyjacking event in 1972 and the seizure of the West German Embassy in 1975. However, these two events were qualitatively different from the mass-casualty terrorist attacks that are associated with contemporary terrorism (Hoffman 2006). Traditionally, many analysts have viewed the terrorist threat against Sweden as relatively low, and other European countries are considered to be at greater risk for acts

of terrorism (Hansén 2007, van Dongen 2010). However, contemporary terrorism knows no borders, and in 2010 Säpo decided to upgrade the threat level by one stage, from low to elevated (Säpo Annual Report for 2010: 20). According to this pivotal source, while it is, of course, fortunate that no major mass-casualty attacks have occurred in Sweden, the country must nonetheless enhance its capacity to deal with potential future attacks. We can also assume that Sweden's limited experience of dealing with major terrorism-induced crises means that there are both practical management and knowledge gaps about how to deal with mass-casualty events caused by terrorist attacks. Consequently, it is likely that both public and private responders in Sweden have what Levitt and March (1988) have termed a *paucity of experience problem*.

The importance of inter-organizational collaboration is not only expressed in policy documents and among practitioners, but is increasingly a topic of interest in *research*. Many scholars share the conviction that both public and private organizations are cornerstones in countering and managing terrorism. As Lindberg and Sundelius (2012:1296-1297) state: "It is an obligation of good governance to prepare for the unthinkable and to allocate the necessary resources to minimize the impact on people and our democratic societies from catastrophic events, such as antagonistic attacks, man-made accidents or natural disasters." Existing research not only implies that *organizations matter* (Quarantelli 2000), but a significant number of researchers have also established that collaboration has become a predominant organizational trend (Stern 1999, Kendra and Wachtendorf 2003, Kapucu 2008, Moynihan 2008, Berlin and Carlström 2008, Uhr 2009, Boin and 't Hart 2010, Kapucu, Arslan and Demiroz 2010).

Above all, and as will be shown later, scholars argue that inter-organizational collaboration is the main organizational principle for dealing with complex crises. In crisis research, the concept *complex crises* often refers to complicated crises stretching over, for instance, territorial, temporal and functional boundaries (Ansell, Boin and Keller 2010). Hence, collaborative actions are assumed to be necessary due to new challenges emanating from a society increasingly characterized by interconnectedness, complexity, ambiguity and uncertainty (Renn, Klinke and van Asselt 2011). In particular, inter-organizational collaboration is regarded as necessary in the context of extraordinary events, where immediate resources often are insufficient (Comfort, Boin and Demchak 2010). Without entering into the debate about what constitutes successful crisis management, it appears that researchers increasingly interpret *good capacity* to include the ability of organizations to carry out collaborative actions.

For all of its vagaries, the notion that challenges posed by terrorism require the involvement of multiple organizations acting in a collaborative way seems to have become part of the scholarly consensus. It is important to note, however, that inter-organizational collaboration does not come about easily. Accordingly, this dissertation's point of departure is that inter-organizational collaboration is of increased importance when preparing for and responding to a terrorism-induced crisis on rail bound traffic. Nevertheless, we must also devote scholarly attention to better understanding the *challenges* of inter-organizational collaboration. In fact, both practitioners and researchers talk about a *collaboration puzzle*. This relates to how collaborative actions, despite the fact that they are accepted to be a well-established necessity, continue to be the most critical factor in a crisis response. To put it simply, collaborative actions among organizations are, in practice, difficult and challenging. In addition, the collaboration puzzle also highlights the fact that analytical conceptions of inter-organizational collaboration tend to deviate from conceptions that are used in crisis management practice (Kettl 2008, Ansell, Boin and Keller 2010, Boin and Bynander 2014).

Accordingly, inter-organizational collaboration can be portrayed as a double-edged sword – both as part of the solution and as the problem (Quarantelli 1978). Although organizations increasingly find themselves in the midst of collaborative arrangements and scholars increasingly focus on the importance of collaboration, we still have much to learn about the mechanisms underpinning effective collaboration in crisis settings, as well as the challenges to successful management. This dissertation aims to contribute to our understanding of these issues by examining a specific type of crisis – terrorism targeting rail bound traffic.

1.1 Aim and research questions

The overarching purpose of this dissertation is twofold; *to analyze how public and private organizations prepare for and respond to crises emanating from terrorism targeting rail bound traffic; and to unravel and discuss current practices and the obstacles they create for inter-organizational collaboration*. The research is organized as a compilation of five appended papers, each with its own set of research questions. For analytical purposes, the different questions are synthesized into four overarching research questions, which are used to analyze the results of the dissertation.

- (1) *How has the phenomenon of terrorist attacks targeting rail bound traffic developed over time? (Paper I)*

The first research question is motivated by an empirical gap concerning the extent and development of the phenomenon of terrorist attacks targeting rail bound traffic internationally. This question also captures terrorism as a multi-faceted form of antagonistic political violence by focusing on the conceptual debate concerning what constitutes *contemporary terrorism*. Accordingly, it discusses whether or not attacks on rail bound traffic can be seen as an example of contemporary terrorism.

- (2) *What are the main challenges in pre-hospital care following a mass-casualty attack targeting rail bound traffic? (Paper II)*

The second research question aims to contribute to our systematic understanding of the most immediate response following a terrorist attack on trains and subways. Hence, the focus is on collaboration at the scene of the event. Building on a comparative study of international experiences, this question asks whether or not the most immediate response involves additional complicating factors when the crisis is terrorism-induced. Thus, the question revolves around whether the observed shift towards more indiscriminate terrorist killings poses new management challenges for responding personnel.

- (3) *Who are the main crisis management actors, organizations and processes in Sweden in the event of a terrorist attack on rail bound traffic, and how do the different actors perceive their capacity to respond to such a crisis in a collaborative manner? (Papers III, IV and V)*

The third question is examined through a case study of Sweden. The case study builds on an analysis of central documents and interviews with key actors in both the crisis response structure and the rail bound traffic system in Sweden. This question seeks to unravel how the central actors themselves perceive the threat of terrorism, and whether they think that they have a sufficient level of relevant knowledge, resources and collaborative skills in order to adequately prepare for and respond to an attack targeting rail bound traffic.

- (4) *How can current practices and the obstacles they create for inter-organizational collaboration in crisis management be understood? (Papers I, II, III, IV and V)*

The purpose of the fourth question is to focus on practices in inter-organizational collaboration from different perspectives. By merging the

different fields of crisis management, terrorism studies and disaster medicine, and by drawing on analytical concepts from crisis management phase delimitation and the limits and merits of collaboration networks, this question addresses critical organizational and cognitive factors set against the threat of terrorism targeting rail bound traffic.

1.2 Outline of the dissertation

The dissertation is divided into ten different sections. The *first* section provides an introduction, including a discussion of the aim of the research and the research questions posed in the study. It also includes an elaboration of the overarching research problem through the introduction of the contours of a terrorism-induced crisis scenario and highlights the importance of inter-organizational collaboration. The *second* section provides a deeper understanding of the area of research by presenting the empirical context, i.e., how rail bound traffic is perceived as highly vulnerable to terrorism. The *third* section further elaborates the empirical components that have guided the formulation of the research focus. In this section, special attention is devoted to the characteristics of the crisis management environment. The *fourth* section provides an account of previous research on crises and emphasizes the need for a multidisciplinary approach. I draw upon three central subfields: crisis management research, terrorism studies and disaster medicine. The *fifth* section addresses the conceptual design and explains how the five appended papers are united by a set of analytical themes. I devote particular attention to how I understand terrorism as a crisis, crisis management as actors and phases, and, finally, how I conceptualize and focus on inter-organizational collaboration through a network perspective. The *sixth* section discusses methods and material, as well as contextualizes the Swedish case study. The *seventh* section provides an overview of the five appended papers and their main results. The *eighth* section is devoted to an analysis of the results of the papers. It provides answers to the four overarching research questions and ends with an explanation of the main challenges of inter-organizational collaboration that pertain to the Swedish case study. In the *ninth* section, I return to the fictional scenario used in the dissertation. I discuss how this scenario, given my research findings, is assumed to play out if it were to occur in Sweden. Finally, section *ten* includes the five appended papers, each of which can stand on its own.

2. A vulnerable rail bound traffic

It should be stressed at the outset that this is an empirically driven dissertation, and this makes context important. The initial research focus grew out of a realization about how problematic it appears to be to protect rail bound traffic from terrorist attacks. We can begin this section by noting that terrorist attacks that target rail bound traffic are nothing new. In fact, history provides us with plenty of evidence that trains, stations and railway tracks have been targets of sabotage and attack for a long time. However, public transportation – rail bound traffic included – has now become a theater of operation for terrorists whose goal is to cause mass-casualty events (Jenkins 2001).

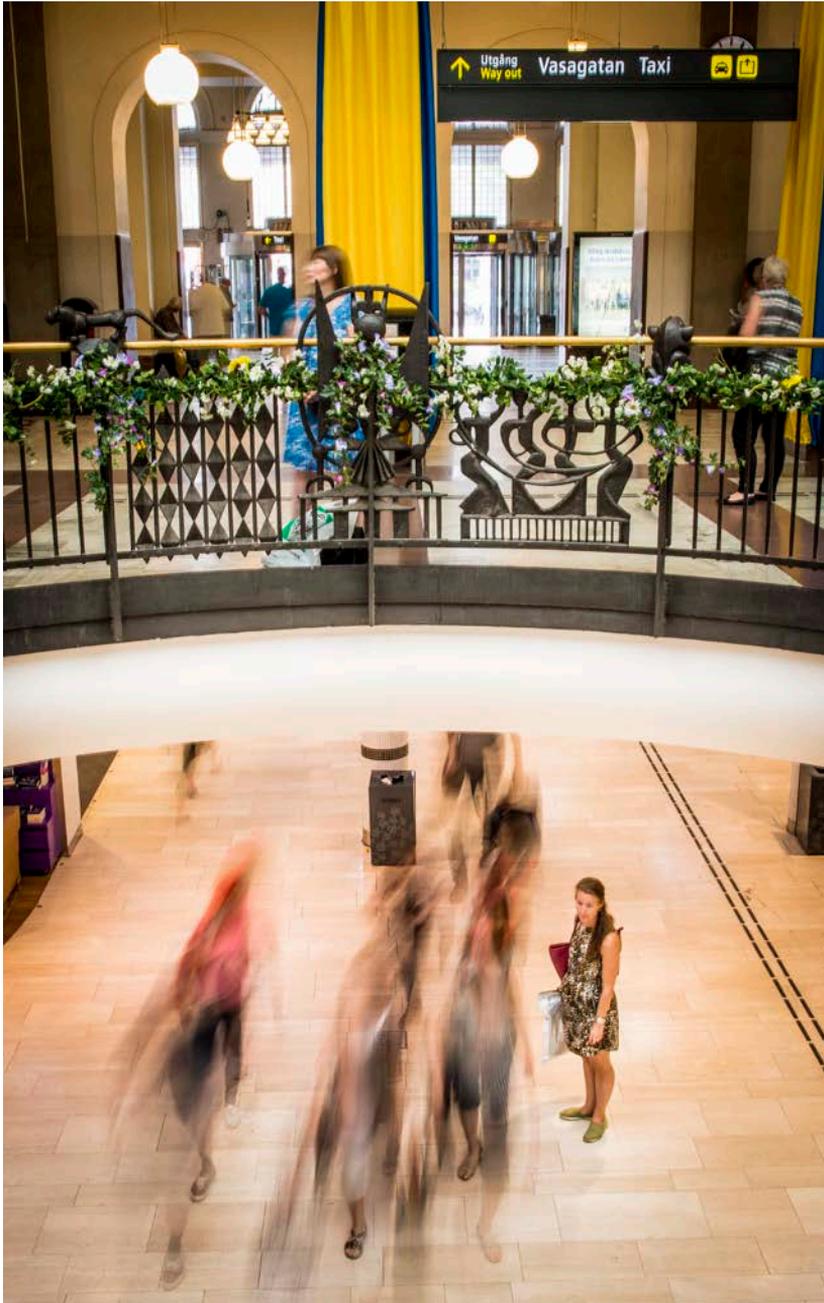
An attack on a crowded train station or a commuter train can be expected to have severe consequences in terms of loss of life (Jenkins 2012). In light of the large-scale terrorist attacks of the past two decades – for example, the sarin gas attack in Tokyo in 1995, the Madrid bombings in 2004, the London bombings in 2005, the bombs targeting Mumbai's commuter system in 2006 and 2008 and repeated attacks in Russia – Jenkins's (2001) argument seems to have some face value.

There are also documented examples of thwarted attacks, and rail bound traffic is often mentioned in the media as a potential target for acts of violence. For example, printed media in the United States has reported on several terrorist plots involving plans to attack trains and subways, for instance plots targeting the subway system in New York in 2004 and 2009 (Jenkins 2012). Threats targeting European high-speed trains have also been reported (the BILD 2013). Train stations were also mentioned as potential targets when the Norwegian police's security service reached out to the public in 2014, announcing the existence of an imminent terrorist threat against Norway (Aftenposten 2014).

Rail bound traffic constitutes an attractive target for terrorists because of the potential it has to cause major harm and devastating mass-casualty situations. Rail bound traffic is also a fundamental part of the so-called critical infrastructure of a society – including transport infrastructure, telecommunications and utility provision – that is essential to the maintenance of economic and daily life (Boin and Smith 2006, Wilson et al. 2007). Consequently, an attack on train or subway systems is also an attack against a society's critical infrastructure, which can cause major disruptions in vital societal functions. In a time when services in society are becoming increasingly interconnected, i.e. critical dependencies exist, one can

reasonably argue that modern systems have become increasingly vulnerable to breakdowns. Therefore, it has become even more important to protect rail bound traffic against long periods of breakdown (Wildavsky 1988, Boin and Smith 2006).

How to secure mass transit systems against terrorism has become a growing concern (Waugh 2004). In practice, however, it is extremely difficult to secure railroad traffic from antagonistic acts, and one can argue that rail bound traffic is a unique sector due to its inherent vulnerabilities. Above all, major security and mitigation challenges create vulnerability (Jenkins 2001, Waugh 2004). One of the most distinguishing features of a rail bound system is its openness. There are few security measures on such systems due to the need for easy passenger access and the rail system's extensive geographical reach. At the same time, there is the possibility of anonymity and numerous escape routes for perpetrators (Jenkins 2001). In addition, there are large numbers of passengers in confined spaces, which is attractive to terrorists who want their attacks to produce a large number of casualties. The security challenges facing rail bound traffic are even more obvious when it is compared to air travel. Surface transportation cannot be secured in the way that commercial aviation is protected today. Passenger profiling, metal detectors and armed guards, all of which have become part of the landscape at airports, cannot be applied to rail bound traffic (Jenkins 2012).



There are many security challenges facing rail bound traffic, crowded train stations are at risk for terrorist attacks. (Photo by: Andreas Strandh)

Furthermore, rail bound traffic also differs from aviation with regard to how security is organized. Both rail bound traffic and aviation are institutionally fragmented environments. However, aviation is often described as a transportation sector with a uniting and distinctive security culture. This security culture not only encompasses strict security controls when embarking on a flight, but also includes the prioritization and organization of security on an institutional level. Since the 1930–1940s, aviation has followed a path in which security is a priority. For example, the Chicago Convention stipulating international efforts to promote security was ratified in 1944. The Convention established the International Civil Aviation Organization (ICAO), a special organization within the United Nations (UN), and charged it with the responsibility to set standards and regulations for international aviation safety and security (Janic 2000, Andersson and Vedung 2010, Mackenzie 2010). Similar collaborative bodies with a mandate to develop institutionalized security mechanisms do not exist for rail bound traffic. Instead, initiatives to enhance security vary across both countries and the many different railway actors.

An examination of rail bound traffic in Sweden shows that it is an integral part of the overall transportation system in the country, and transportation volumes continue to increase (Forsberg 2012). Trains are not only essential for the country's urban infrastructure, but also for connecting people across the geographically large country. The Swedish railway system has undergone far-reaching deregulation since 1988, and there are now numerous actors involved in Swedish rail bound traffic. For example, the Association of Swedish Train Operating Companies (ASTOC) consists of no fewer than 35 different companies divided into passenger and cargo traffic (ASTOC 2015). The extent to which such fragmentation can create vulnerabilities due to vague decision-making procedures and unclear divisions of responsibility among actors is frequently discussed among policy makers as well as scholars (Alexandersson and Hultén 2008, SOU 2013:83). However, it is important to note that such discussions tend to revolve around whether increased fragmentation is to blame for the current situation in rail bound traffic in Sweden – i.e. recurring reports of dissatisfaction due to poor management, mishaps, derailments, lack of punctuality and insufficient information to passengers.

The implications of diffuse ownership of critical infrastructure and a constantly changing rail bound traffic environment for security and crisis management is discussed much less frequently. In particular, only limited attention has been paid to the role of rail bound traffic actors in times of major crises and to the capacity of these actors to function under extraordinary circumstances, i.e., ones that differ from daily routines. There has also been

limited attention directed to the issue of the capacity of rail bound traffic actors to resume operations and recover quickly after crisis situations. Given the centrality of transportation in modern society today and critical dependencies, such matters must be explored further. Accordingly, an important empirical component that has guided my research is my observation that there are no obvious general guidelines in place for how rail bound traffic actors can or should prepare for major crises. This observed uncertainty relates particularly to the specific type of crisis of terrorism targeting rail bound traffic. To my knowledge, no systematic research with this focus has been carried out in Sweden.

3. An increasingly complex crisis management environment

We now proceed to a discussion of the empirical context of crisis management. An understanding of the research topic of the dissertation requires familiarity with the particularities characteristic of the crisis management environment, including a high degree of uncertainty and its increasingly multifaceted nature. Many practitioners, policy makers and scholars seem to agree that, given the antagonistic element inherent in terrorism, full prevention is simply impossible (Hoffman 2006). It follows from this that if a crisis cannot be prevented, then preparedness is essential (Comfort, Boin and Demchak 2010). Further elaboration of the crisis management environment reminds us that this dissertation examines a highly challenging type of crisis, one that can be expected to pose very demanding crisis management challenges. A critical factor to keep in mind is that if a small emergency occurs, it can often be managed using regular resources, and the response can be coordinated through methods of established command-and-control. However, large-scale crises and disasters are too complex to be managed like this (Boin and Bynander 2014), and they are therefore qualitatively different from an emergency, and hence require somewhat different planning and management (Quarantelli 1997:41).

If a mass-casualty terrorist attack takes place, we can assume that a response network of substantial size will be activated. Earlier large-scale crises, for example, the 11 September attacks in 2001, the London bombings in 2005 and Hurricane Katrina in 2005, have all demonstrated how collaborative actions – in particular, coordination of resources – emerge as a critical factor in such situations (Boin and Bynander 2014). Managerial challenges are related to the fact that a response network most often consists of a significant number of different actors. In addition to specialized established organizations, such as first responders, other types of organizations are needed, including actors who do not necessarily engage in response activities on a daily basis: transportation actors, private enterprises, non-governmental agencies and volunteers (Dynes 1970, Moynihan 2008). We are thus faced with collaborative networks that are characterized by many different organizational types, each with their own culture, areas of responsibilities and ways of working. Such diverse networks give rise to demanding realities for the organizations involved (Waugh and Streib 2006, Comfort, Boin and Demchak 2010).

Extraordinary crises are also challenging from a preparedness perspective. It is reasonable to believe that preparatory efforts for such events differ from the actions taken when planning for recurring and well-known contingencies. Accordingly, we can assume that how different organizations prepare for the eventuality of a terrorist attack is inherently linked to how they perceive and act upon the *low probability–high consequences event dilemma* (Birkland 1997). This term refers to an event that has a low probability of occurring, *but* if it *does* occur, the consequences are potentially enormous. Public managers working with crisis management therefore face the difficult task of deciding the extent to which they should invest time and resources into preparing for something that rarely, if ever, happens. Borrowing a formulation from Kapucu’s (2008:246) description of low probability–high consequences events: “they compete for attention with the priorities of daily living.”

As an empirical background to this dissertation, it is important to bear in mind that organizational crisis management is a rather new specialization, both as a policy area and professional practice. As a policy area, crisis management has undergone major transformations, and public authorities are increasingly paying greater attention to policies of risk and crisis management (McEntire 2004, Gilpin and Murphy 2008). Despite this, however, Comfort, Boin and Demchak (2010:5) argue that: “conventional policy-making and bureaucratic organizations are not well designed to manage threats that emerge rapidly in unforeseen and often undetectable ways.” Hence, the high degree of uncertainty involved in preparing for future crises makes crisis management a rather unique policy area. Compared to other political domains, which are often built around stable institutional boundaries and common rules and practices (March and Olsen 1998), the crisis management field does not follow predictable stable patterns. Rather, unforeseen changes are part of the environment (Hewitt 1983, Boin and ‘t Hart 2006). It is more or less a question of governing the *unexpected* (McConnell and Drennan 2006, Weick and Sutcliffe 2007).

Governing the unexpected is, to a large degree, a matter of developing prevention and mitigation initiatives, and such actions have traditionally been a national government responsibility (Comfort, Boin and Demchak 2010). In the policy field of crisis management, as well as in the area of societal security, the state has a fundamental responsibility to protect its citizens. Above all, the public expects governments and public agencies to do their utmost to keep them out of harm’s way. Governments and public agencies are also expected to take a prominent role when a large-scale crisis occurs, something which requires mobilizing resources from all levels of government (Boin and ‘t Hart 2006, Kamien 2012).

However, an important aspect of the empirical background of this dissertation – and something that has influenced my research focus – is the observation that a major transformation seems to be taking place in current crisis management, and it is a change that ultimately challenges the traditional view of the state as the prime bearer of citizens' security. At the same time as the public expects governmental agencies to have the necessary capacities to deal with crises and to take an active role in a crisis situation, we can observe that governments at all levels are increasingly reaching out to engage actors from the private sector (Boin and Smith 2006, Coppola 2011, Rademacher 2014). Hence, crisis management has branched out and we now see the development of networks that include the private sector. This is often motivated by the argument that such a development is necessary in order to meet growing challenges in an increasingly complex society. Nevertheless, the lines between governmental and nongovernmental activities remain blurry (Rademacher 2014). Moreover, Comfort, Boin and Demchak (2010:5) argue that, compared to public organizations, non-governmental actors – for example, businesses, schools and citizens – are less prepared to deal with complex contingencies. Hence, based on this discussion of the empirical background, we can conclude that the crisis management environment seems to be increasingly multifaceted or, alternatively, fragmented. The way in which this affects how public and private organizations prepare for major crises such as terrorism is an issue that deserves further attention.

4. Related research – developments and debates

This section explains how our understanding of the research topic can be enhanced by concepts and ideas from crisis management research, terrorism studies and disaster medicine, and it forms the basis for the combination of perspectives that is presented in the next chapter.

As discussed previously, *organizations matter* in crisis management. Therefore, one can turn to public administration and organizational studies for guidance. In particular, this field has made several contributions to crisis management, not least regarding how leaders act and deal with critical decision-making and communication and information sharing. This body of research often focuses on leaders' cognitive and strategic challenges during the most acute phase of a crisis, as well as on political risks, opportunities and policy changes following crises ('t Hart, Stern, Sundelius 1997, Stern 1999, Rosenthal, Boin and Comfort 2001, 't Hart and Boin 2003, Boin et al. 2005).

However, for the purpose of this dissertation, and in order to answer my research questions, which are inspired by a multidisciplinary approach, research conducted within public administration cannot be the only theoretical point of departure. It is too narrow. In fact, looking at how public administration researchers have approached the study of crises, Rosenthal (2003) has argued that mainstream public administration researchers have been uncomfortable studying crises and crisis management. He contends that disasters, riots and terrorism seem to challenge the foundations of public administration and, in fact, have never been core issues in the field. Thus, in order to understand the particularities associated with crisis management, and in particular to understand how organizations operate during times of uncertainty, when they are faced with acute time pressure and unpredictable organizational constellations, one must turn to other fields of research for additional guidance.

My endeavor to map previous research that could inform my research topic quickly led me to conclude that a multidisciplinary approach was necessary. As Smith (2006:6) observes: "crises caused by deliberate acts, such as terrorist attacks, cannot be analyzed easily, and in particular, they do not fall neatly into any particular analytical or theoretical paradigm." Accordingly, my research has been guided by several different, yet closely related, fields of research. I found three subfields particularly informative. The first is crisis management research, which provides an understanding of the overarching managerial side of crisis management processes. The second field is terrorism

studies, which reveals the complexity associated with terrorist events. The final body of literature is disaster medicine research, whose strength is that it provides information about the operational components of the most acute phase of the crisis management process.

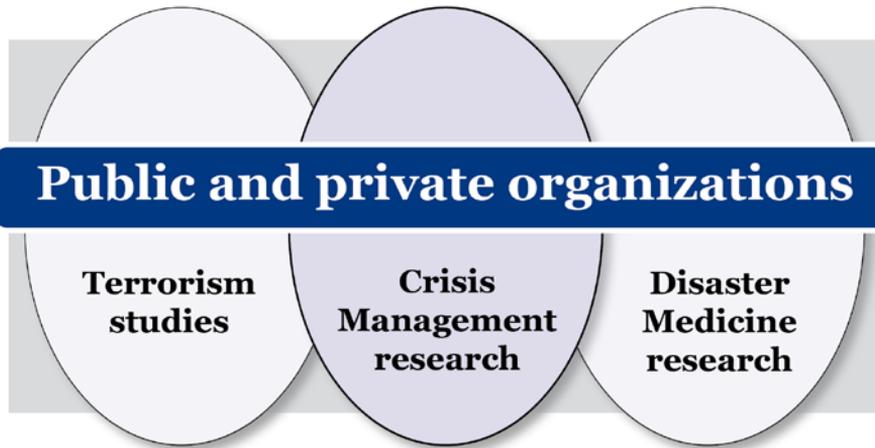


Figure 1. In order to capture and understand the problematique associated with public and private organizations' preparedness and response practices, I draw upon three different fields of research: crisis management research, terrorism studies and disaster medicine.

4.1 Crisis management research

I will first discuss the crisis management literature, which has greatly influenced this dissertation. It should be noted that different research subfields overlap and terminology differs among scholars (Boin and t'Hart 2007). The terms *crisis* management, *emergency* management and *disaster* management research are often used interchangeably. However, subtle and practical distinctions are made by theorists and practitioners (Boin and t'Hart 2010). Briefly, scholars tend to speak of crises when, for example, an organization or nation perceives a urgent threat to core values or functions that must be dealt with under time pressure and conditions of uncertainty (Rosenthal, Boin and Comfort 2001). Thus, the crisis approach covers a broad range of crisis situations (Boin and t' Hart 2007). The term *disaster*, on the other hand, is traditionally associated with major natural disasters. Putting it simply, a disaster is often characterized as *a crisis with a bad ending* (Boin 2005). Emergency is primarily understood as a more limited critical situation, one that is often associated with the realm of first responders.

We can therefore establish that the terms crisis, disaster and emergency can refer to different types of events of different scales. Moreover, one can observe that the terms are used somewhat differently in different countries. For example, research carried out in the United States tends to use the term disaster research, while the term crisis management research is used more frequently in Sweden.

Literature reviews often refer to the fact that early scholarly contributions to the field of disaster or crisis management research were heavily influenced by an approach in which crises were perceived to primarily be the result of natural agents, foreign enemies or sudden disasters. The *natural hazards approach* generally focused on physical environmental events (and still does so today). Typical case studies in research using this approach include large-scale disasters such as earthquakes. Early research tended to view a disaster as an *act of god*, indicating a sense of dealing with the unmanageable, thereby signaling a feeling of passivity (Handmer and Dovers 2013). Since the focus in this dissertation is on organized efforts to manage a large-scale crisis, this kind of traditional approach is problematic. Fortunately, the crisis management field has moved away from such perspectives (Boin et al. 2005).

A crucial step towards the development of a stronger social science perspective and the recognition of disasters – or crises – as social phenomena was made possible through the establishment of the Disaster Research Center (DRC) at the University of Delaware in the 1960s. In contrast to the natural hazards approach, in sociological research, which is exemplified in the work of the DRC, groups and communities are often used as case studies. Quarantelli's *What is a disaster* (1998) is an example of research based on the sociological perspective. The title is revealing, because the research field struggles with conceptualization of central concepts – crisis, disaster, emergency – as well how they are related to one another. Moreover, Quarantelli's *Ten Criteria for Evaluating the Management of Community Disaster* (1997) is a central piece of research focusing on the importance of developing capacities to evaluate the management of crises. It addresses the pressing question of what really constitutes effective crisis management. There are methodological difficulties associated with measuring the outcomes of crisis management processes. This has led several researchers to argue that we need a more systematic approach to understanding and evaluating how different actors deal with crises. A systematic approach is particularly important when analyzing the management of extraordinary events, which are often highly complicated (McConnell 2011).

In addition to the natural and the sociological views of crises, the *Industrial Crisis School* has also been influential. An organizational perspective is

applied throughout the bulk of this literature, which explores large-scale crises such as the near-meltdown of the Three Mile Island nuclear power plant in 1979, the industrial accident in Bhopal in 1984, the nuclear accident in Chernobyl in 1986 and the space shuttle Challenger disaster in 1986. The Industrial Crisis School has been crucial for enhancing our knowledge about large-scale events. It has also played an important role for our understanding of safety and security cultures in organizations, addressing, for example, troubling questions about tightly coupled and complex systems (Mitroff, Pauchant and Shrivastava 2006).

The crisis management field has been continuously enriched by new case studies, increasingly ones that adopt a multidisciplinary approach (Rosenthal, Boin and Comfort 2001). The September 11 attacks were not only a critical juncture in themselves, they also had a tremendous impact on how research on crises and disasters is conducted. Man-made crises became a priority on many research agendas, and research funding focused on societal security increased dramatically (t'Hart and Sundelius 2013). Moreover, the events of September 11 illustrated the challenges that large-scale terrorist attacks create for responding organizations. They revealed the existence of research topics that had not received the attention they deserved. For instance, more research was initiated to explore the implications of the fact that organizations that respond to large-scale events are confronted by many unanticipated challenges, which demands a great deal of entrepreneurship. Creativity in crisis management, i.e. the relationship between planning, improvisation and self-organization, is one example of a relatively new research topic (Kendra and Wachtendorf 2002, Wachtendorf 2004). In recent years, increased attention has also been paid to the long-term consequences of major crisis events. Thus, researchers now pose questions about how we can strengthen crisis management capacity through developing resilient organizations and communities. How public organizations can interact with private and nonprofit organizations in a mutually beneficial way is another topic of current concern, as is the responsibility of volunteers and individuals in crises (Comfort, Boin and Demchak 2010). In short, contemporary crisis research now covers various aspects of the crisis cycle and includes work designed to increase our understanding of all the different dimensions pertaining to the phases of crisis mitigation, preparedness, response and recovery.

Research in this vein is also carried out in Sweden. In fact, scholarly interest in various aspects of emergencies and crises has expanded. This can be seen as a response to the different types of crises the country has faced in recent years (Lindholm Schulz 2010, Deverell, Hansén and Olsson 2015). For example, Sweden has faced crises such as the *Estonia* ferry disaster in 1994 and the major fire in a disco in Gothenburg in 1998. Sweden also faced a crisis

when a large number of Swedish citizens were killed in the *Indian Ocean tsunami* in 2004. In addition, a major storm, *Gudrun*, caused significant material damage in 2005, and in 2014, Sweden experienced one of the country's largest forest fires in modern history. Events like these have cast a spotlight on critical aspects of Swedish crisis management practices and prompted calls for further research (Hasper 1998, Hagström and Sundelius 2003, Kamedo Report – 91, SOU 2005:104, Sjökvist 2015).

4.2 Terrorism studies

Hansén (2007) suggests that terrorism can be perceived as a crisis. Almost by definition, it imposes a sense of insecurity, threatens fundamental values and evokes major uncertainties (see Boin et al. 2005 on the three components of a crisis). Hence, the terrorism-crisis link is important. The element of terrorism is addressed in a body of research called terrorism studies. It is a rather diverse field of research. The origins of the field can be traced back to 1970-1978. At the time, research on terrorism was of interest to a limited group of scholars. Since then, the field has constantly expanded to include new topics to be explored, and several aspects of terrorism have been covered extensively in the literature (Ranstorp 2007) – including history and development of terrorism (Wilkinson 2001), variation in domestic/transnational terrorism (Enders and Sandler 2005), counter- terrorism strategies (Sandler 2010, LaFree 2009), root causes (Newman 2006) and suicide bombings (Hoffman and McCormick 2004, Crenshaw 2007). Traditionally, this field of research has had a significant focus on the concept of prevention, understood as revolving around measures aimed at preventing acts of terrorism from happening, including analysis of intelligence and national terrorism prevention programs (Schmid 2004, Kamien 2012).

One can easily identify an upswing in terrorism studies since the September 11 attacks in 2001. These events caused, in the words of Duyvesteyn (2004:443), “a tidal wave of literature trying to understand terrorism”. In particular, the literature is characterized by its attempt to understand the attacks as “a new chapter in terrorism’s history.” The groundbreaking events of September 11 led to a feeling that terrorism was becoming even more unpredictable and taking on new forms. The question of whether we should understand terrorism as a new or contemporary phenomenon is at the heart of several scholarly debates. Researchers such as Hoffman, (2006) Laqueur, (2003) and Rapoport (2004) have all emphasized that we are seeing something new, and that this newness has to do with four characteristics of contemporary terrorism. First, the perpetrators of terrorist actions operate transnationally and in loosely organized networks. Second, to a significant degree, today’s terrorists are inspired by religion. Third, today’s terrorists seek

weapons capable of attacking as many people as possible. Fourth, there is an assumption that victims of contemporary terrorism are not carefully selected. Rather, terrorists are indiscriminate as regards who they kill. This approach to terrorism, i.e., the contemporary terrorism paradigm, has been met with skepticism by some scholars. What they question, above all, is the actual newness of what we are witnessing. Well-known spokesmen for the critical view include Duyvesteyn (2004) and Tucker (2001).

Given the fact that terrorism is a highly political issue, it is not surprising that distinct fields of terrorism studies have emerged. The lack of a common definition of terrorism and the way in which this impedes analysis contributes to the problem of developing knowledge in this field of study (Crenshaw 2001). Running the risk of oversimplification, one can identify two broad strands of research within terrorism studies. One body of scholars is closer to *a war on terrorism discourse*, while a second group characterizes terrorist events as *criminal acts*. Such a division is also reflected in actual counterterrorism strategies (Lafree and Hendricksson 2007). The war on terrorism has received major political and media attention. Related to this is an ongoing debate within the research community about whether studies that have an increasingly policy-relevant focus are diverting attention away from theory building, which many consider to be a pressing task for researchers in the field. Crenshaw (2014) concludes that the field has been plagued by an inability to develop cohesively integrated and cumulative theory. Another common critique is that there are a limited number of research articles focused on methodology (Ranstorp 2007). Silke's (2004) rather pessimistic observations about terrorism studies point to recurring challenges, including the difficulties of data collection, too few experienced researchers and a tendency to draw generalizations that are too far-reaching. Such criticism is echoed by an emerging subfield, critical terrorism studies (Jackson 2007). Closely related to this is the work of scholars such as Buzan, Waever, and Wilde (1998) and Eriksson (2004), who pay attention to the *politics* of security and how crises can be framed as threats to national security. Another emerging development in terrorism studies is increased recognition of the inherent links between studies of terrorism, homeland security and crisis management (Waugh and Streib 2006, Tierny 2007, Kapucu 2012).

4.3 Disaster medicine research

Parts of this dissertation emphasize the immediate operational aspects of a terrorism-induced crisis. This means actions undertaken in a context of pre-hospital care, in which the main aim of responding personnel is to save lives. In order to examine the unique challenges faced by first responders, we must turn to the research field of disaster medicine. This field is often described as encompassing different areas of medicine, including pre-hospital care, emergency medicine and traumatology. Internationally, disaster medicine sets out to cover a broad array of situations, from natural to man-made disasters (Nilsson 2012). It evolved as an own research community in the mid-1980s, as a result of a merging of the fields of disaster management and emergency medicine (Ciottono 2006).

Lenquist (2005:300) defines disaster medicine as “the science for analysis and development of the methodology requested to handle situations where available resources are insufficient in relation to the immediate need of medical care”. Thus, studies often focus on various managerial issues that arise in sudden events where there is a lack of resources needed to deal with the situation (Rüter 2006). The ultimate goal of the health care system in such disaster situations is to reduce or prevent, to the greatest degree possible, both the loss of life and health and subsequent physical and psychosocial suffering (Ciottono 2006). A lack of resources is characteristic of many disaster settings, and a related issue that gets frequent attention is how to deploy resources in an efficient way. Both the Madrid bombings in 2004 and the terror attacks in Norway in 2011 demonstrated the fact that the primary challenge was not a crisis of manpower, but rather a matter of placing resources at the right place at the right time (Kamedo report 90, 97).

Responding to mass-casualty situations encompasses several generic components: triage, adequate rescue techniques and protective equipment, surge capacity and different injury patterns. Such components are frequently addressed in the literature through the use of detailed case studies of specific major incidents. The time factor is often stressed as a critical issue. The concept of *the golden hour* is used to underline the fact that trauma patients need urgent care. The essence of the golden hour is that trauma patients have better outcomes if they receive definite care within 60 minutes, and the concept is the foundation of much of the contemporary trauma system (Lerner 2001).

Despite the fact that many components in disaster medicine are generic, there are particularities as well. A growing number of researchers are focusing on the assumed uniqueness of responding to acts of terrorism, in fact, the term

terror medicine has been coined (Shapira and Falk 2012). This research community argues that indiscriminate terrorist attacks have changed *the rules of the game* for responding personnel (Ciottono 2006, Shapira, Hammond and Cole 2009). For example, according to Shapira and Falk (2012:256): “from an attack mitigation and management perspective, one aspect has consistently proven to save lives. Namely, the effective medical treatment of terror victims.” It has been concluded that medical response to terrorist attacks tends to be most sophisticated and effective in countries exposed to antagonistic threats and crises, as well as among those groups who train and face such challenges on regularly basis. The military is often mentioned as a prime example. Therefore, it is not surprising that a significant amount of knowledge in this field derives from Israeli experiences (Leibovici et al. 1996, Frykberg 2002).

Our knowledge about disaster situations requiring medical attention is constantly growing. Nevertheless, scholars argue that mass-gatherings and their vulnerability to different forms of accidents or deliberate attacks are not well understood (Arbon 2007). The main criticism aimed at this particular field of knowledge is that the research is often limited to descriptive reports on specific events. Moreover, it is difficult to compare the consequences and outcomes of different types of incidents, and shortcomings are often expressed in very general terms (Ruter, Örttenwall and Wikström 2004). The development of performance indicators has been proposed as one way to approach the field in a more systematic and scientific manner (Nilsson 2012).

5. Conceptual design

As was mentioned previously, this dissertation is organized as five distinct papers, each of which contributes to the overarching aim. Paper I presents an empirical overview over terrorist attacks targeting rail bound traffic internationally between the years 1970-2010. Analytically, its point of departure is a conceptual debate concerning the main features of contemporary terrorism. Paper II focuses on experiences of managing large-scale terrorist attacks internationally, including in Tokyo, Madrid, London and Mumbai. Drawing on insights from previous crisis research, this paper develops an analytical framework for categorizing and analyzing different aspects of complex responses to terrorism on rail bound traffic. Papers III, IV and V constitute a Swedish case study that includes an examination of changes in Swedish counterterrorism policy and analysis of how public and private organizations have developed practices, networks and ideas about inter-organizational collaboration in order to respond to terrorism targeting rail bound traffic. These three papers draw upon analytical concepts found in the network and governance literature and use the different phases of crisis management as their analytical structure.

The appended papers differ in terms of their focus and the analytical tools and concepts that they employ. However, they share certain analytical themes. First, terrorism is viewed as a crisis. Second, crisis management processes are interpreted through the lens of different actors and crisis phases. Third, inter-organizational collaboration is viewed as the main organizational principle in crisis management, and collaborative actions are interpreted as being carried out in networks. These analytical themes are developed by merging and highlighting the inherent links between the three fields of research that were discussed in the previous section.

5.1 Terrorism as crisis

The concept of terrorism is widely debated, and academics, politicians and security advisers tend to interpret terrorism in their own particular ways. However, all definitions typically stress the importance of the terrorist's *political and ideological purposes* (Wilkinson 2006, Deflem 2010). The element of threat is also crucial in most definitions. According to Hoffman (2006:3) "terrorism revolves around violence, but of equal importance is the *threat* of violence, used and directed in pursuit of a political aim." *Psychological elements* are therefore of importance in defining terrorism. Furthermore, terrorism is directed at *noncombatants*, people who are not members of military organizations, but civilians who are thus not prepared to

defend themselves against political violence. Acts of terrorism, by most definitions, are carried out by *sub-national groups or clandestine agents*, which means that political violence by nation-states is not considered terrorism (Ruby 2002). Terrorism can be seen as a strategy of surprise, in which the use of extensive violence is meant to produce change and achieve a particular aim (Crenshaw 1987). The consequences of such actions and how they are managed are at the center of attention in this dissertation. Accordingly, I emphasize how we can understand terrorism not only as a specific, destructive event, but also from the perspective of how it is managed by responding organizations. In other words, I view terrorism as a crisis.

A *crisis* can take different forms and strike at different levels, affecting individuals, organizations, cities and countries. Despite this, there are some elements that are common for all types. The term *crisis* is often conceptualized as consisting of three elements: threat, urgency and uncertainty (Boin et al. 2005). *Threat* refers to situations in which shared values such as safety and security are in danger, for instance, because of violence or large-scale destruction. Those involved in the crisis perceive a sense of *urgency*, or time compression. Thus, a crisis needs to be dealt with immediately. The element of *uncertainty* refers to the many questions that arise in a crisis. What happened? What will happen next? What can we do? (Boin and 't Hart 2006). Responding to a crisis is commonly described as something that belongs to the *un-ness* field, which means that it involves dealing with the *unexpected*, *undesirable* and the *unimaginable* (Hewitt 1983, McConell 2011).

Recalling the defining elements of terrorism that were outlined above, it is clearly the case that terrorism, almost by definition, can be placed in the *un-ness* field. Above all, an attack evokes a sense of threat, urgency and uncertainty. Hansén (2007:19) states that: “the uncertainties evoked by terrorist events range from the mere surprise of their taking place where and when they do, to the dynamics of the situations they give rise to.” Moreover, terrorist attacks are often categorized as so-called fast-burning crises, which means that they have a clear starting point and are short and decisive in character. This type of crisis draws analytical attention to the most acute response phase of the event ('t Hart and Boin 2001, Hansén 2007). Another category of crises is so-called long-shadow crisis. These crises are characterized by their scale and major managerial challenges, and they are often agenda setting. The terrorist attacks in New York, Madrid and London are well-known examples ('t Hart and Boin 2001). In those crises, analytical attention goes beyond the most acute phase of the response. As Hansén and Stern (2001) have pointed out, when a crisis ends depends upon how it is managed. Hence, the preconditions for managing an extraordinary event become crucial. Put differently, “the shadow a crisis casts tends to be longer if

it becomes obvious that poor management was related to suboptimal preparedness, or if subsequent investigations are botched” (Hansén 2007:21).

Following this line of reasoning, I conceive of crisis management as not only encompassing the managerial challenges that occur during the most acute phase of a crisis, but also the crisis management actions taken before a crisis strikes and the actions after it occurs. Thus, this dissertation differs from many earlier scholarly works that have shown a tendency to conduct empirical studies of crises in a framework that defines crises as specific, sudden *events*, i.e., using a so-called event-centered approach. Instead, here, more attention is devoted to the managerial perspective, which involves perceiving crisis management as a broader organizational *process* (Deverell 2010, Roux-Dufort 2007).

5.2 Crisis management as actors and phases

Looking at crisis management as an organizational process, we can conclude that, as an academic field, it seems under-theorized (Smith and Elliott 2006, Deverell 2010, Roux-Dufort and Lalonde 2013). There is no *grand crisis theory* that lays out the assumptions about how organizations work, or do not work, in crises. Crisis management is often perceived to be a matter of practical action rather than a theoretical concept. However, the crisis management research field refers to *crisis theory*, even though the robustness of actual theory building is contested. McEntire and Marshall (2003) discuss epistemological challenges for crisis management research, i.e. how and why knowledge is necessary. The epistemological problems that McEntire and Marshall regard as most central include conceptualization of disasters and disaster management; uncertainty about which variables, hazards, phases and actors should be given priority in research, and which paradigms can contribute to disaster and crisis management research. They also argue that the complexity of crisis management is only now being fully recognized; therefore, the identified epistemological challenges “may be overcome by avoiding extreme perspectives in emergency management theory” (McEntire and Marshall 2003:125).

The core of crisis theory pivots on the understanding that a crisis management process goes through different phases, or that it can be seen as a crisis cycle. As mentioned previously, the phases are prevention/mitigation, preparedness, response and recovery (Mileti 1999, Kapuchu 2008, McEntire 2007, Coppola 2011). Scholars from different sub-fields within crisis management research use different terminology to refer to the phases and employ varying degrees of analytical specification. How I interpret and use the phases will be explained next.

When I study terrorist-induced crises and their management as a wider organizational process, I find it beneficial to use phase delineation for two main reasons. First, the phases can be used in order to *structure* large parts of a complex empirical material. That is, they are analytically useful for structuring the complex twists and turns associated with crisis management processes. By unpacking crisis management processes into smaller components, it is possible to identify recurring challenges and critical sequences. The phases also prove analytically useful for discerning temporal aspects of crisis management (Comfort, Boin and Demchak 2010:3). Second, the notion of different phases draws attention to specialization among organizations, i.e. how different *actors* are expected to carry out a number of different *activities* during the different phases. By drawing particular attention to the many actors and their various activities, it is possible to capture the diverse networks of actors involved in the different stages of a crisis.

Given my specific interest in crises induced by terrorism targeting rail bound traffic, my argument is that the various phases need to be understood from the perspective of a particular terrorism context. This requires that we merge several bodies of research. The crisis cycle appears heavily influenced by case studies that were typical in earlier work in the disaster management field, mainly of which were concerned with natural hazards. The disaster or crisis cycle often starts with a first phase in which prevention and mitigation are merged. Prevention and mitigation efforts include actions that seek to make hazards less likely to occur or to reduce their negative effects if they do. Types of mitigation efforts depend on the hazard, although, traditionally, the disaster and crisis literature tends to discuss mitigation from the perspective of natural hazards – for example, how structures and systems can be strengthened in order to protect people. Hence, it relates to activities aimed at recognizing risks and vulnerabilities, as well as to the need to enhance a society’s ability to withstand unpreventable events (Coppola 2011). The very strong focus on mitigation efforts (often with a structural perspective) that is characteristic of disaster and crisis management literatures is some distance from the specific type of crisis that this dissertation focuses on. For this reason, and in order to enable me to present a more specific discussion about preventive measures and mitigation efforts directed at *man-made crises* such as terrorism, I use the concept of *prevention* as it is understood in the field of terrorism studies.

Prevention refers to actions aimed at preventing an event from occurring in the first place (Schmid 2004). In the study of the relationship between terrorism and crisis, then, it refers to such human and actor-based factors as intelligence, law enforcement and operational principles, for example, for

different agencies and security services. Despite the emphasis on prevention in the field of terrorism studies, there has also been increasing interest in *mitigation* efforts. In the context of terrorism, mitigation connotes, for example, efforts to reduce potential breeding grounds for terrorism.

The next phase proposed by the crisis management literature is *preparedness*, which focuses on actions undertaken before the crisis. Put differently, it is about how to equip actors that have responsibilities in crisis management with the proper tools. Conceptually, preparedness goes beyond written plans, but it nonetheless tends to be associated with crisis preparedness plans in the literature (Perry and Lindell 2003). *Response* pertains to immediate actions taken during the initial phase of a crisis, actions that include saving lives and preventing further human suffering and damage to property. The response phase is probably the phase that is studied most frequently (Mileti 1999, Boin, McConnell and 't Hart 2008). Finally, *recovery* refers to actions taken in the aftermath of the intense crisis period – during and immediately after the event – and includes activities aimed at getting society and victims' lives back to normal. One should note that the *bounce back* element of recovery (Wildavsky 1988) is closely related to the concept of *resilience*, which has become prominent in the crisis management literature (Comfort 1994a, Kendra and Wachtendorf 2003, Comfort, Boin and Demchak 2010). There are multiple definitions of the concept of resilience, and it is beyond the scope of this research to examine them all. However, a common operationalization of resilience originates from Bruneau and Reinhorn (2007), who operationalize it as “the four Rs” of resilience. The first is robustness, which means the ability to withstand a given level of stress or demand without losing function. Redundancy is the ability to retain functional requirements in an event of disruption. Resourcefulness is the ability to supply material and human resources necessary to achieve established priorities. Finally, rapidity refers to containing losses and avoiding further disruption. The synchronizing element of all temporal phases in the crisis cycle is an underlying *future-oriented approach* towards planning for unexpected events (Kapucu, Hawkins and Rivera 2013).

As illustrated in the discussion above, the crisis cycle can be related to different temporal aspects and different types of specialization of activities. In addition, phases can be connected with certain *actors*. For example, terrorism studies connect law enforcement and prevention – these actors undertake various activities with the goal of thwarting terrorist attacks. One can therefore observe that the prevention phase tends to draw attention to so-called *security* professionals. These are professionals who are used to working with closed information systems and managing intelligence material (Lindberg and Sundelius 2012). In the disaster and crisis management

literature, Kapuchu (2008) summarizes how the phases are associated with different actors. Mitigation arises from a structural approach to crisis management and damage, which is characteristic of an engineering perspective. Thus, traditionally, mitigation efforts are associated with engineers. Preparedness is mostly associated with crisis management planning and efforts to shape plans in order to minimize the effects of a crisis, and thus most often relates to public managers. The response phase is primarily the realm of first responders, while the recovery phase tends to be populated mainly by local authority service providers. These phases call attention to so-called *safety* professionals. In comparison to the previously mentioned security professionals, crisis safety professionals are used to working with open information and may not always find it necessary to use intelligence-based information (Lindberg and Sundelius 2012). As a result of merging the concepts and studying the relationship between terrorism and crises, we can conceptually assume that there will be an interesting intersection between those who are trained to prevent terrorism from taking place - the so-called security professionals – and the crisis managers, who concentrate on preparing for and responding to a wide range of crises – i.e. the so-called safety professionals.

Understanding crisis management through different phases raises certain caveats. Some publications argue that the use of the term “phases” might be misleading, because it seems to suggest that a crisis process is linear, something which most crisis management scholars would reject. Instead, the process is regarded by many to be cumulative rather than sequential. For example, Neal (1997) discusses the drawbacks of using the concept of phases. Moreover, paying attention to all phases of the crisis cycle inevitably impacts on the degree of attention that can be paid to details. Still, based on the fact that crises are frequently described and understood as complex phenomenon or complex systems (Boin and Rhinard 2008, Ansell, Boin and Keller 2010), my position is that emphasizing a particular component of the process is too narrow. Instead, the different phases should be connected and used as a coherent analytical tool in the identification of relevant actors, activities, responsibilities, levels and linkages in a crisis management process.

5.3 Focusing on inter-organizational collaboration

Inter-organizational collaboration is a third analytical theme that recurs in all five appended papers. Given the core function of the concept of inter-organizational collaboration and related ideas about networked approaches to crises, it requires further elaboration. As stated previously, there are many complex interactions between various actors in the crisis phases and at different levels of response, which means that researchers have plenty to do.

In addition, over time, collaboration has emerged as a main organizational trend in crisis management (Dynes and Aquirre 1979, Waugh and Streib 2006, Comfort 2007, Kapucu 2008, Moynihan 2008, Berlin and Carlström 2008, Uhr 2009, Comfort, Boin and Demchak 2010, Ödlund 2010, Curnin et al. 2015).

The underlying assumption in inter-organizational collaboration is that collaborative responses, often described as response *networks*, are an efficient way to respond to increasingly complex crises (Boin et al. 2005). This increased emphasis on collaboration has developed over time. In the literature, we can observe that response structures were heavily influenced by a military *centralized approach* until the late 1970s (Dynes 1994). At the center of attention were concepts such as command and control, and the *vertical dimension* of the response structure was stressed. Particular interest was directed towards rapid decision-making procedures, clear lines of authority and decreasing the risk of internal conflict (Stern 1999, Deverell 2010). However, this centralized approach has come into question, because it is seen as unable to fully cope with the intersectional and cross-jurisdictional collaboration challenges associated with the fragmentation, complexity and dynamism that characterizes society today (Klijn and Koppenjan 2004, Sørensen and Torfing 2012). As a result, the *decentralization thesis* has also been put forth in the field of crisis management (Deverell 2010). It emphasizes the *horizontal dimension*: networks, flexibility, innovation and creativity (Goldsmith and Eggers 2004).

Following the developments in the relevant literature, we can assume that the public and private organizations that are studied in this dissertation operate in a fundamentally changing context. Looking at the crisis management field, broader societal changes seem to be reflected in how various response structures are depicted and discussed. The literature on public management provides information about some of the radical changes that have occurred since at least the 1970s, i.e. pointing out the significant influence that globalization and deregulation have had on the preconditions for public organization and the shift from a focus on government to governance (Rhodes 1996, Peters and Pierre 1998). Governance is often described as a new way of governing, one that reflects the fact that dealing with today's complex challenges and crises requires knowledge and expertise from outside government (Edelenbos and Klijn 2007). The state governs by formulating policy, legislating, and presenting political intentions. Nonetheless, other actors are assumed to participate and to be engaged, primarily through networks, in order to achieve common goals. Hence, current network organizations reflect a qualitatively different form of governance structure than the bureaucratic hierarchies they replace (Kapucu 2005, O'Toole 1997).

As stressed earlier, part of the collaboration puzzle arises from the fact that analytical conceptions of inter-organizational collaboration tend to deviate from how the concept is used in crisis management practice. Adding to this, there is a multitude of different interpretations of the concept among scholars. Hence, conceptually, inter-organizational collaboration is imbued with definitional problems due to wide variations in terminology and conceptual understanding. There is inter-organizational coordination, collaboration and cooperation, multi-agency cooperation, inter-agency cooperation and cross-sectorial cooperation, just to mention a few of the most common formulations. These concepts are used in various contexts to signify different things and, above all, to refer to different degrees of interaction.

My review of the research leads me to the conclusion that many crisis and disaster management scholars address inter-organizational relations using *coordination* as their key concept. A majority of their studies start with a particular crisis event, which they study retrospectively, and the research focus tends to be on how resources and information were coordinated and distributed among actors. For the purpose of this dissertation, this understanding of coordination is not fully applicable, because significant attention is devoted to how inter-organizational relations are developed early on in the crisis management process and do not necessarily revolve around specific coordination issues. Instead, we can turn to the concepts of *cooperation* and *collaboration*. However, these two concepts are also used very differently by different scholars, for example, they can refer to both long term and short term forms of inter-agency relations and interactions. In order to avoid greater terminological confusion, I will use the term collaboration as an overarching term in this dissertation.

The much cited network-theorist Kapucu (2010) refers to Bardach (1998:8), who defines collaboration as “any joint activity by two or more agencies that is intended to increase public value by working together rather than separately.” Hence, I interpret the core of the concept of inter-organizational collaboration as referring to the fact that organizations need *knowledge* and *resources* from each other in order to solve otherwise unsolvable problems. Furthermore, organizations must *interact* to achieve common goals, and such collaborative actions can be both short term and long term.

It should also be emphasized that collaboration relates to the concept of coordination. This is because the literature tells us that collaboration can have several outcomes, and in a crisis or disaster management environment, efficient coordination is often the most preferable outcome. Hence, we can argue that the slippery concepts associated with inter-agency relations and

collective actions also tend to have different meanings depending on which temporal aspect of the crisis management process we concentrate on.

Unless organizations merge, such inter-agency interaction can be construed as a *network*, i.e. a process of horizontal exchanges in which inter-organizational collaboration refers to a form of interaction that goes beyond simple communication or networking among actors. The actors involved construct a common frame of reference based on the idea that collaboration leads to both internal and external advantages. Hence, like several other crisis management researchers, I interpret the concept of inter-organizational collaboration as being closely linked to networks (Moynihan 2009, Kapucu 2012). Collaborative networks are seen as a fundamental component of any crisis response, and the term network is used to refer to relations among multiple organizational (Kapuchu 2005, Waugh and Streib 2006).

As mentioned previously, inter-organizational collaboration is described by researchers as a double-edged sword, indicating that collaborative actions can turn out to be successful, but also might fail. The research problems thus pertain to the difficulty of understanding what factors might contribute to or hinder effective inter-organizational collaboration. This leads us to a consideration of literature that discusses the *merits* and *limits* of networks.

Existing theories on collaboration suggest that *trust and confidence* are core merits of networks, because they reduce the costs of collaboration and are therefore assumed to foster collaborative advantages, both of which are often identified as key characteristics of networks. The importance of personal relations and trust is often mentioned in this regard (Coleman 1990, Edelenbos and Klijn 2007). Networks are also assumed to enable *rapid dissemination of information* among their members (Kapucu 2005), something that is important due to the fact that time is a factor in crises. Moreover, rapid dissemination of information is assumed to *enable* collective sense making (Weick 1988). It is a common proposition that networks are *flexible* and can thereby foster *creativity* and *innovation* (Goldsmith and Eggers 2004). The necessity of flexibility in crises is well established among crisis researchers. It is needed in order to handle unforeseen developments and manage chaos in crisis situations (Kapucu 2008). An assumed flexibility is also tied to the concept of *self-organization*, which relates to the creative reallocation of resources that are needed to achieve a common goal in a rapidly changing environment (Comfort 1994b).

Regarding the limits and challenges of networks, scholars debate whether highly complex networks can be *managed* and coordinated at all. This is particularly important in crisis situations, which we know are characterized

by the fact that many different actors are involved (Dynes 1970). Another discussion in the literature revolves around how, if at all, *accountability* can be demanded and determined in network structures (Rademacher 2014). Other drawbacks of networks involve the risk of *internal conflicts*, *lack of mechanisms* for conflict resolution and differences in the distribution of relative power and influence (Klijn and Koppenjan 2012). Moreover, a basic challenge for networks is the difficulty of establishing a *balance* between network goals and the interests of participating organizations (Moynihan 2005).

Although networks can take on a wide variety of forms, the general assumptions about the merits and limits of networks discussed above play a central role in this dissertation as regards studying challenges to inter-organizational collaboration. In particular, I draw on these insights when examining how public and private organizations perceive their roles and preparedness capacity to respond in a collaborative manner to a major terrorist attack on rail bound traffic.

	Prevention	Mitigation	Preparedness	Response	Recovery
Temporal aspects	Before a crisis	Before a crisis	Before a crisis	During a crisis	After a crisis
Activities	Actions to prevent an event from taking place	Actions to lessen the damage of an event	Developing capacity to deal with the crisis	Immediate actions, saving lives and preventing further damage	“Returning to normal”
Actors	Intelligence actors	Law enforcement Engineers	Crisis management planners	First responders	Local authorities
Type of organization	Security professionals	Security Safety professionals	Safety professionals	Safety professionals	Safety professionals
Paper I	X	X			
Paper II		X	X	X	X
Paper III	X	X			
Paper IV		X	X	X	
Paper V		X	X	X	X

Table 1. Summary of the components in the different crisis phases, shows in broad terms how the appended papers focus on different phases.

To summarize this section, I have presented the conceptual design and have explained how I developed three overarching analytical themes that unite the five appended papers. My ambition is to make an analytical contribution by bringing together the fields of crisis management, terrorism studies and disaster medicine. There are obvious differences in how these fields view crises, and, therefore, they pose different research questions. Nonetheless, there are also inherent links between them. In my effort to unravel and discuss different practices, networks and the related development of ideas in inter-organizational collaboration, such a multidisciplinary approach is necessary. Since today's crises are often talked about as complex phenomena (Ansell, Boin and Keller 2010), and because crisis management processes are often described using words such as complicated, complex and multifaceted (Coppola 2011), we need new and innovative approaches. My framework, which I have outlined here, is such a contribution.

In particular, my conceptual design makes it possible to study crisis management practices and networks beyond the most acute crisis phase. For example, table 1 shows that the different papers emphasize different temporal aspects of crisis management. Papers I and III revolve mainly around preventive actions and mitigation efforts before a crisis takes place, while papers II, IV and V also address the response and recovery phases. Moreover, the framework also draws analytical attention to different types of organizations. Furthermore, it covers different types of action required in crisis management, ranging from, for example, counter-terrorism efforts as addressed in paper III, to preparedness activities and rescue efforts aimed at saving lives, which are explored in papers II and IV.

The purpose of this design is not only to unravel striking complexity, but also to highlight intersections between phases, actors and activities. Table 1 illustrates my overarching analytical tool for identifying relevant actors, activities, responsibilities, levels and linkages in a crisis management process. It shows that challenges to inter-organizational collaboration do not pertain exclusively to a specific phase or a specific set of actors. Rather, it is in the intersection between phases and types of organizations that many challenges seem to emerge. In the next section, I explain how I have carried out my research with the help of this conceptual approach.

6. Methods

In this section I discuss methodological considerations, including the overall research design as well as the specific methods and research material used in the dissertation. The section also includes a further elaboration on the context of the Swedish case study. I begin by presenting three points of departure that have been decisive for how the research process has been conducted.

6.1 Points of departure

Research on crises and their management can take different forms and employ different designs. In order to develop my approach, I formulated three starting points as a way of thinking about crisis management research. As the dissertation is a compilation of five papers, these points of departure have also served the purpose of uniting these distinct parts in a cumulative way. The three points of departure are: (1) a multidisciplinary approach, (2) a comprehensive perspective on crisis management and (3) an ambition to work closely with involved stakeholders and practitioners. I will discuss each of these below.

(1) For some time, scholars (Pearson and Clair 1998, Boin 2005, Rodriuez, Quarantelli and Dynes 2006, McEntire 2007, Comfort, Boin and Demchak 2010) have emphasized the need for a multidisciplinary approach to studying crises, i.e. using tools and knowledge from different disciplines in order to develop new ways to consider complex research problems (Dillon 2001, Youngblood 2007). This conviction has arisen out of a realization that the crisis management field is becoming increasingly multifaceted, thus requiring multiple perspectives (McEntire 2007). I have written this dissertation while affiliated with both a research institution in political science and one in disaster medicine – two research environments that have traditionally been rooted in distinct scientific traditions. My ambition has been to discover their intersections and present an innovative approach to studying public and private organizations' preparedness and response to terrorism targeting trains and subways.

I work with research disciplines that do not always speak to each other on a regular basis. In fact, it is common that one discipline calls for *further research* when, in fact, such research (or related research) is already being carried out in another field. In somewhat simplified terms, political scientists studying crises often call for closer collaboration with practitioners. The disaster medicine field is at the forefront when it comes to working closely with practitioners. However, their work and methods are seldom referred to

in the broader social science field. In turn, disaster medicine studies often highlight how mass-casualty events also can be understood as an organizational or a logistical problem. However, they rarely make use of disaster and crisis management research that addresses organizational behavior in crises. My point here is that we must avoid disciplinary tunnel vision, particularly when studying multifaceted phenomena. My ambition has therefore been to bridge diverse scientific traditions, and I argue that my multidisciplinary approach goes beyond understanding a disaster medicine problem through the lens of political science. Instead, in actual practice, being affiliated with and working at two different institutions has meant constant interaction with two fields of research, and it has inspired me to participate in meetings and conferences with experts working from different scientific traditions. In my view, political scientists and researchers interested in disaster medicine look at extraordinary crises such as terrorism through very different lenses, posing different research questions and therefore using different methods. Thus, in an enriching sense, this dissertation has been researched and written in a way that differs from how it would have been if the work had been conducted based on only one particular discipline.

(2) This dissertation takes a comprehensive approach to crisis management. A traditional view of the comprehensive approach (sometimes referred to as a holistic approach) is that it includes different types of hazards, phases and actors pertinent to crisis management (Whittaker 1997, Godschalk 1991). As stated, in my view, a significant number of studies focus on rather narrow components of the crisis cycle – either on one specific phase or one activity. Indeed, such knowledge is important. However, the argument here is that explaining mechanisms for a certain action or a particular behavior in a crisis requires us to examine different phases. We cannot understand the rescue response to a mass-casualty situation by studying only the most acute phase and first responders. Important aspects are also to be found in the organizational and cognitive preconditions created in the phases before the crisis, as well as in the processes that occur in the phase following the event. Accordingly, crisis management perceived as a comprehensive *process* is of key importance.

(3) The ambition to work closely with involved stakeholders and practitioners has been a guiding principle in my research. Stern and Sundelius (2002) point out that there is a perceived gap between people working practically with crises and researchers trying to understand crises with the help of their scientific toolbox. There are many benefits to establishing a closer dialogue between these two groups (Trainor and Subbio 2014). Above all, practitioners can give an account of an organization that is not possible to acquire by reading written documents, and they can also provide a deeper understanding

of context and problems that they encountered. For example, since there is very little Swedish research on the subject in focus in this dissertation, written strategies and official government reports provide us with limited empirical material. Therefore, the importance of interacting with relevant actors in interviews, workshops, exercises and meetings cannot be overstated. Stern and Sundelius (2002:84) remind us that knowledge transfer is a two-way street. Interacting with interview respondents, i.e. people working with rail bound traffic or crisis management, not only serves the purpose of gathering empirical material. It is also an opportunity to convey knowledge and provide information about the actual research process. In my experience, such meetings often inspire new perspectives of great value. As regards this point, all actors interviewed were asked whether they participate in any form of research collaboration. Most of them do not, which indicates that much remains to be done in order to reduce the gap between practitioners and academia.

6.2 The research process

Since my research consists of five appended papers, it provides a good opportunity to discuss the research process. Flexibility in qualitative research is frequently stressed, and the research design does not need to be completely determined early in the process. As Lewis puts it (2003:47), “the overall design will need to be modified in interaction with the research setting”. Based on empirical observations, early in the research process, the research focus of this dissertation was defined in broad terms as revolving around terrorist attacks on rail bound traffic. Later in the process, a Swedish case study and assumed uncertainties about the country’s capacity to prepare for and respond to an extraordinary terrorist attack provided an empirical focus. The overall research strategy was based on a conviction that vulnerabilities in rail bound traffic and preparedness practices in Sweden cannot be fully understood by looking at the Swedish context alone. As emphasized by Druckman (2005), even when one’s research focus is on a particular context, this does not mean that other contexts are irrelevant for understanding. Therefore, as regards the research design of this dissertation, the Swedish case is informed by international experiences.

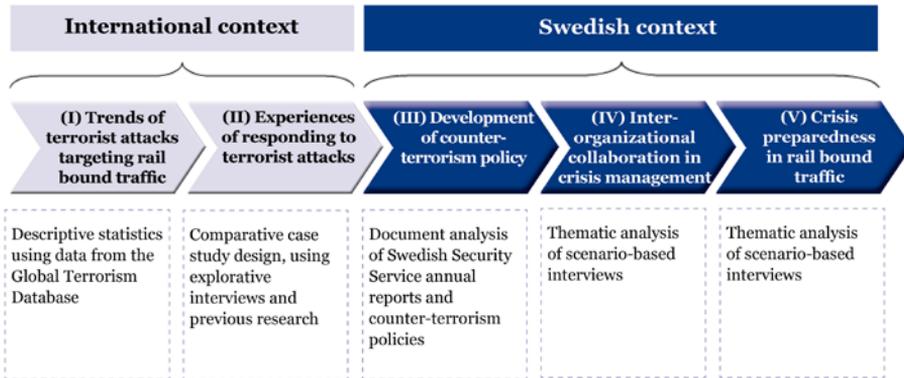


Figure 2. The sequence of the five appended papers

As indicated in figure 2, I have worked in a synthesizing way, in a process in which the findings of one paper have influenced the direction of the research in subsequent papers. When I began the dissertation, an initial literature overview revealed that relatively few scholars had devoted attention to the phenomenon of terrorist attacks on rail bound traffic. To contribute to filling this knowledge gap, I researched and wrote paper I using the Global Terrorism Database (GDT), the world’s largest database on registered terrorist attacks. The paper provided an empirical overview of attacks targeting this sector internationally from 1970 to 2010. All available, registered, cases of terrorist attacks on rail bound traffic were included in the study. Thereafter, the 20 largest-scale attacks were identified and analyzed in detail, which revealed a recurring modus operandi in such large-scale attacks. The striking similarities in the dramaturgy of the events prompted further analysis of their management challenges.

Paper II narrowed the case selection further by focusing on large-scale attacks (Tokyo, Madrid, London and Mumbai) from a comparative perspective. The research focus therefore shifted from the terrorist attacks as a distinct *phenomenon* to the *management* of the events. The four cases can be understood as examples of highly complicated crisis management processes, thus addressing the general research problem (Stake 2006). Scholars have underlined the difficulty of analyzing major crisis events systematically (Lalonde 2007, Roux-Dufort 2007); therefore, one result of my comparative study was a detailed framework for analyzing large-scale terrorist attacks on rail bound traffic. The many points of comparison included in the framework were identified both inductively as well as through insights gleaned from theoretical discussions in crisis management research about recurring management challenges. Six explorative interviews were also conducted in

London and Madrid in order to capture factors that might not have been addressed in national and organizational evaluations, which often serve as the main source of information following crises.

Following the logic of a synthesizing approach, the interviews and findings in papers I and II had a significant impact on the design and research focus of the subsequent papers, which constitute the Swedish case study. In particular, the first two papers focus analytical attention on certain recurring themes and they contributed to the development of a fictional scenario of multiple-attacks targeting the train and subway traffic in Stockholm. Moreover, the findings from paper II and existing theories on network governance and research framing crises from a network perspective all suggest that inter-organizational collaboration is pivotal to an effective crisis response. Therefore, the uniting research focus in papers III, IV and V is how different actors, at different levels of response, seek to unite their knowledge and resources in order to manage the complex threat of terrorism. The Swedish case study is composed of multiple components. First, a systematic document analysis of annual reports from Säpo explores how the threat of terrorism against Sweden has developed since 2001. This inquiry is based on the argument that if we are to better understand Sweden's capacity to respond to terrorism in a collaborative way, we must first understand what we are actually preparing for. In the end, this is decisive for *how* we prepare. The other two papers analyze how the rail bound traffic sector and the crisis management system collectively prepare for responding to terrorism.

As mentioned, the starting point for this dissertation was empirically driven, and the knowledge that was produced was mainly developed inductively. Snape and Spencer (2003) describe the inductive approach as using evidence as the genesis for conclusion. In contrast, the deductive approach uses evidence in support of a conclusion; hypotheses or propositions are developed theoretically. While I have stressed empirical insights, I have nonetheless also considered conceptual aspects underpinning crisis management processes. In addition, I have used the network governance literature, which presents theoretically developed factors about how networks are presumed to work effectively. Thus, in this dissertation, the empirical findings and theoretical insights have influenced each other during the research process; I have moved back and forth between theory and the empirical material. In social science, this approach resembles the essence of abduction (Strauss & Corbin 1998). Using such an approach, I neither test logically deduced hypotheses nor develop theoretical propositions solely based on empirical observations; rather, I combine the two.

6.3 The case study approach

Qualitative researchers have a wide repertoire of data collection and analysis methods to choose from, ranging from focused case studies to in-the-field-for-months ethnographic inquiries (Phillips 2002). Interview-based case studies have come to dominate the crisis management field (Stallings 2007). This dissertation also adopts a single-case study approach, with the important addition that the case study is informed by international experiences. Moynihan (2008) has written extensively on crises and he emphasizes that the nature of networked responses and complex crises makes the single-case analysis approach an adequate research strategy. In brief, the essence of the case study approach is that it enables a detailed and in-depth analysis of a particular case (Yin 2003, Bryman 2012). An additional advantage is that it offers multiple perspectives and makes it possible to examine the links between different parts of complex situations; thus, it allows the researcher to examine relationships and processes rather than to solely concentrate on an outcome (Ritchie and Lewis 2003). Given the fact that this research is process-oriented, the primary interest is the crisis management *process and involved organizations*, rather than the terrorist attack as an *event* or outcome. The benefits of a case study approach are thus convincing.

6.3.1 Case study context

According to Yin (2003:13), a case study approach can be described as an empirical inquiry that “investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident.” In that vein, Yin suggests that a case study approach is superior when the contextual conditions are expected to be, as he puts it, “highly pertinent to your phenomenon of study. “ Following this advice, in examining collaborative efforts to prepare for and respond to terrorism targeting rail bound traffic, the key concept of inter-organizational collaboration must be understood in its intricate political, legislative and organizational context.

6.3.2 The Swedish response structure

In order to better understand the case study in this dissertation, it is useful to provide some information on its particular setting – i.e. the Swedish response structure. The crisis management system is governed by three main principles: responsibility, proximity and similarity. The principle of *responsibility* establishes that the authority that has responsibility for an activity under normal circumstances is also the responsible authority during a crisis. The principle of *parity* states that, as far as possible, an activity carried

out during a crisis should be performed in the same manner as it would be under normal situations. The principle of *proximity* implies that a crisis should be managed at the lowest level possible (krisinformation.se 2012). Municipalities have geographic responsibilities at the local level. Although it is frequently stressed that today's crises often cross sectors and levels of government, a common saying is that a crisis will always hit the local level first. As Eriksson (2010:2) puts it, "the local level is arguably the first line of defense and will more or less always be involved in the immediate response". Sweden's 21 county administrative boards have a geographic responsibility at the regional level, which means that they play an important role in enabling coordination of preparedness at the regional level, for example, through exercises and risk and vulnerability assessments. In a time of major crisis, the county administrative board has responsibility for the important function of coordinating different measures with relevant actors (Government Bill 2007/98:92). Moreover, on the regional level, 20 county councils play an important role in providing health care. They are obligated to have both a crisis management plan and a disaster medicine preparedness in place (National Board of Health and Welfare 2013). At the national level, political responsibility for civil crisis preparedness rests with the Ministry of Justice, which acts through MSB. The latter was established in 2009 for the purpose of providing concerted support to different actors and making society's crisis preparedness activities more effective (Ministry of Defense 2013). Crisis preparedness was previously part of the portfolio of the Ministry of Defense. However, after the national elections of 2014, the new government transferred matters relating to crisis management to the Ministry of Justice, the same ministry responsible for handling matters concerning counterterrorism. A new minister for home affairs was also established in 2014. Every government agency is responsible for emergency or crisis management planning in its own area of expertise, and in order to assure that the Government Office has a coordinated ability to handle crises across sectors, a Crisis Management Coordination Secretariat provides continuous risk and vulnerability assessments (Ministry of Justice 2014).

It should also be mentioned that the Swedish crisis management system, like those of many other countries, has an all-hazard approach to crises. This means that it is assumed that the consequences of crises are similar, regardless of whether a crisis is caused by ill will, nature or accident (Lindberg and Sundelius 2012). Accordingly, the same planning structure can be used in all types of incidents, and, thus, the all-hazard approach presents a basic framework for response in various crisis situations. The response system in Sweden is also influenced by previous types of crises and recurring emergencies. In general terms, in addition to potential nuclear threats,

Sweden has traditionally prepared for weather-related crises such as storms, floods and harsh winter conditions.

In order to fully understand the national response system, one must understand the main characteristics of the Swedish political and administrative system. This is because, in the end, it influences the logic that steers the current crisis management system. It should be mentioned here that, compared to other countries, the Swedish political and administrative system sticks out as being organized around small ministries and large agencies (Eklund 2008). The possibility of direct political control of agencies is limited because ministerial rule is prohibited by law. The Swedish system has a dualism due to the fact that there are both ministries and national agencies. Formal governmental control is confined primarily to legislative processes and annual appropriations (Modell, Jacobs and Wisel 2007). In this specific area of crisis management, the most central pieces of legislations are the Civil protection act (2003:778), the Act on municipal and county council measures prior to and during extra-ordinary events in peacetime and during periods of heightened alert (2006:544), and the Emergency management and heightened alert ordinance (2006:942). Furthermore, a characteristic of the Swedish system is that government agencies enjoy a considerable degree of autonomy and maneuverability. Central features of the country's long-established political culture include efforts to promote mutual trust, negotiations in public decision-making processes and consensus building among actors (Christensen, Laegreid and Wise 2002).

6.4 Obtaining material and analyzing data

In this dissertation, I use a combination of data collection methods (Lewis 2003). I combine descriptive statistics, interviews, a scenario methodology and analysis of central documents. In addition, I participated in training sessions and exercises in order to improve my contextual understanding. Below, I explain how my empirical material has been obtained and how the data has been analyzed.

To begin with, it should be emphasized that I have relied heavily on previous scholarly work aimed at understanding crises and their management from different perspectives. As discussed earlier, different strands of research have inspired the five appended papers and their respective designs and research focus. As an academic field of knowledge, research on crises has witnessed significant development. However, access to such literature and research environments focusing on crises and disasters vary across countries. For that reason, it was of great importance that I had the opportunity to spend 6 months at the Disaster Research Center at University of Delaware in 2013. The

DRC was established by Enrico L. Quarantelli and Russel Dynes and is seen as the forerunner for the growing number of disaster and crisis research centers around the world, that conduct much of current crisis management research (Wettenhall 2014). The stay gave me to access to the *E.L. Quarantelli Resource Collection*, which contains a comprehensive collection of research addressing social and behavioral science aspects of disasters.

Earlier research	Written documents	Interviews	Databases	Sources to improve contextual understanding
<ul style="list-style-type: none"> -Research on public administration -Crisis management research -Terrorism studies -Disaster medicine research 	<ul style="list-style-type: none"> -Annual reports from organizations -National strategies -Risk and vulnerability assessments -Evaluation Reports -Newspapers 	<ul style="list-style-type: none"> -20 interviews on the Swedish context -6 interviews on the international context 	<ul style="list-style-type: none"> -Global Terrorism Database 	<ul style="list-style-type: none"> -Workshops -Training -Exercises

Table 2. Different types of sources of information that have been used in the dissertation.

6.4.1 Written documents

According to Stallings (2007:70), regarding methodological considerations in disaster contexts, written documents refer to “material [such] as newspapers, strategies, after-action or evaluation reports, and they are all physical records regardless of format that were created by someone other than the researcher for a purpose other than that for which they will be used by the researcher”. I have used a great variety of written documents. National inquiries and evaluation reports written after the four international examples of responding to terrorism were very important for paper II. Such reports look at crises retrospectively, in hindsight, and in reading them, I have been sensitive to the potential for bias on the part of the authors of the evaluation reports. No organization wants to come across as having failed completely in a crisis situation (Stallings 2007). Written documents have also been used in the Swedish case study, which covers papers III, IV and V, although in different ways. Annual reports from the Swedish Security Service from 2001 to 2013 were analyzed in a systematic way in order to capture changes in Sweden’s understanding of threats facing the country. Sweden’s public organizations are obliged to conduct risk and vulnerability assessments, and I also examined these documents, which are seen as central for providing efficient direction for the society’s preparedness (Eriksson and Juhl 2012). In addition, national

strategies, written communication from the government and official government reports (SOU) are important. Together, such documents have been read for the purpose of identifying the national direction of crisis management and counterterrorism and to determine whether or not organizations' preparedness and response capacity are a topic of discussion. In reading these documents, I have been guided by an understanding of them as documents intended to be messages to the public.

6.4.2 Scenario based interviews

This dissertation studies organizations that operate in a field that is characterized by uncertainty (Hewitt 1983, Boin et al. 2005). In addition, the actual crisis agent we are interested in, terrorism, is characterized by its unpredictability (Hoffman 2006). This poses some intriguing methodological challenges, and it is necessary to be innovative in order to capture such uncertainties in a systematic manner. The empirical core of papers IV and V is a set of 20 scenario-based interviews that were carried out as part of the Swedish case study. These interviews revolve around a fictional scenario of terrorism targeting Stockholm. This was my solution to the methodological challenges associated with an inquiry that partly revolves around a crisis that has not (yet) occurred. I drew inspiration from how public managers in the practical field of crisis management often work and analyze uncertainties – i.e. they use scenarios in various ways (Stern and Sundelius 2002, MSB 2013). Working with scenarios is not a common methodological approach to answer research questions in political science. The disaster medicine field, on the other hand, does have a tradition of working with scenarios. Hence, combining a fictional scenario with a more traditional semi-structured interview method can be seen as a methodological contribution that arises from my determination both to work multidisciplinary and to consider perspectives from both academia and the practical crisis management field. Before elaborating further on the methodological approach used here, I will present the actual scenario. It is not a worst-case scenario; rather, its components are built on the findings of papers I and II, i.e., it echoes the results from the empirical overview as well as the results from the comparative study of four international responses to large-scale attacks on rail bound traffic. The number of casualties in the scenario is an average based on the 20 largest-scale terrorist attacks targeting rail bound traffic internationally between 1970 and 2010. The type of targets, number of incident sites and tactics used by the terrorists also reflect recurring patterns in the 20 largest-scale attacks. In addition, the average number of fatalities and injured at the different sites have been adjusted to reflect what we know from research – that there is greater lethality when explosions take place in confined spaces and a large number of injured when a derailment occurs.

SCENARIO

The fictional scenario is a situation in which central Stockholm becomes the target of four coordinated bomb explosions carried out by an unknown terrorist group. The bombs are hidden in backpacks. A first bomb explodes on a passenger train while it is stopped at a platform at the central station. Two subsequent explosions take place on a subway train between two downtown stations – “Hötorget” and “Rådmanstgatan.” An additional bomb explodes on an “Arlanda Express,” train, i.e., a high-speed train traveling to Stockholm’s international airport. In total, four bombs explode during morning rush hour traffic on a Friday morning, during a short span of time between 08.12 and 08.16. The attack causes a complicated mass-casualty situation, including the deaths of 80 people. At least 300 persons need immediate medical care.

- Incident site 1 – 15 fatalities and 70 wounded
- Incident site 2 – 45 fatalities and 155 wounded
- Incident site 3 – 20 fatalities and 70 wounded

The injury pattern involves terrorism-specific injuries such as blast, penetrating and burn injuries. In addition, there is a large number of walking wounded, leading to a surge at local hospitals. The scenario presents major challenges for the rescue operation due to the risk of both additional explosions and unexploded material and because there are multiple incident sites. One must assume a complete shutdown of the transportation system, which creates severe logistical problems for the capital. The scale of the attack presumes the need for inter-organizational coordination of resources on a local, regional and national level – with possible assistance from other countries.



In the fictional scenario, bomb explosions take place at the two downtown stations "Rådmanngatan" and "Hötorget," causing a complicated mass-casualty situation. (Photo by: Andreas Strandh)

The development of a scenario had two main methodological purposes. *First* it served as a tool to systematically identify organizations to include in my research. Since a crisis of the type I am studying has not taken place in Sweden, there is no defined network that can be studied retrospectively. By outlining the character of the crisis, we get an indication of which actors can be assumed to participate in responding. In a crisis with vast societal consequences, the number of potential actors is large, and I do not claim to have interviewed all of them. Instead, I motivate my selection based on the criteria of including the actors most central in the scenario. This encompasses the targeted train and subway companies – SJ AB (passenger traffic), Arlanda Express (airport train), MTR Stockholm (subway traffic), and Jernhusen (owner of the central station) – and the central transportation authorities, i.e., the Swedish Transport Administration and the Swedish Transport Agency. The immediate response apparatus is represented by representatives from the police, fire service and hospitals. I have also included respondents from different levels in the Swedish response structure, in particular, the city of Stockholm at the municipality level, the county administrative board and the county council at the regional level, and MSB and Säpo at the national level. Additional information about the interviews can be found in Appendix I. Other actors that have been mentioned and discussed in the interviews, although not interviewed for this study, include the military, media, voluntary organizations and organizations focusing on psychological care following a major crisis.

The second methodological purpose of the scenario was to use it as a framework for discussion, and, above all, as a way to point interviewees in the direction of talking about an *extraordinary* event, as opposed to daily emergencies or other challenging situations. This was deemed particularly important because Swedish actors suffer from a paucity of experience problem and therefore cannot discuss on the basis of their own experiences of responding to a mass-casualty, terrorist-induced crisis. By developing a scenario, I sought to reduce the risk that the researcher and the respondent would have very diverse understandings of the scale of the crisis being discussed and the term capacity. For instance, talking about preparedness for dealing with roughly 400 casualties or a complete shutdown of the transportation system sets the framework for discussion.

The scenario and a semi-structured interview guide was prepared and sent to respondents in advance, which gave them an opportunity to reflect upon their organizations' capacity in a systematic way before the interview. The interview guide was informed by the analytical themes discussed in previous sections. The overarching themes for the interview guide were threat perception, preparedness activities, immediate response capacity, inter-organizational

collaboration, recovery and learning processes. Thus, both cognitive and organizational aspects of the crisis management process were included. The format of semi-structured interviews is described as “neither strictly structured with standard questions, nor entirely nondirective” (Kvale and Brinkman 2009:31). Accordingly, I made a point of asking the respondents the same set of questions, thereby directing attention to themes and certain concepts of interest, for example, trust, command and control, resilience and lessons learned.

In order to gain new perspectives and allow organization-specific aspects to be addressed, I let respondents talk freely on themes that they regarded as important. As Yin (2009:102) puts it, “the strength of the interview is the possibility to focus on a topic of inquiry and gain knowledge about what the respondents perceive as important given their specific organizational context”. The interview guide also included an opportunity for respondents to raise their own reflections on matters that I did not bring up. (The interview guide can be found in Appendix II). I view the interviewees as respondents, meaning that I understand them as a source of data about their organizations based on their own personal perceptions (Esiasson et al. 2012).

All interviews were conducted in person at different venues. In a majority of cases, I visited the respondent’s workplace, which gave me greater contextual understanding. In general, the interviews lasted between 60-90 minutes. In the beginning of each interview, I gave a short introduction to the research project, explained both the purpose and how the material was to be used. The interviewees were informed about confidentiality and their right to terminate the interview and decline to participate at any point. The interviews were recorded, and subsequent follow-ups varied – from interviewees who read the transcript of the interview and added comments and complemented it with further documents, to others with whom I had no further contact. In some cases I sought complementary information. Because I recorded the interviews, it was possible to transcribe them word for word. Sharing Kvale and Brinkman’s (2009:180) view that the transcription exercise is an “interpretative process and an initial analytical process itself”, I opted to do all the transcribing myself. It should be noted that a few interviews deviated from the process described here. One interview was conducted by telephone, and one was complemented with a written account. In a few cases transcription was partly hindered by technical problems.

The format of semi-structured interviews with predefined themes guided how the material was subsequently analyzed. The different phases in the crisis cycle structured the material. This was particularly important due to the complex network structure characterized by a significant number of actors

performing different tasks at different temporal stages of a crisis. In addition, the data was also sorted in thematic sets (Ritchie, Spencer and O'Connor 2003). This was followed by a deeper meaning making process, which can be described as a concentrating approach (Kvale and Brinkman 2009). The purpose of the concentrating approach is to reduce the amount of material to a more manageable level and to become familiar with the material in order to discern recurrent or diverging lines of thoughts in respective predefined themes (Ritchie, Spencer and O'Connor 2003). At a very practical level, I used different colored markings to distinguish the different patterns.

6.4.3 Data from the Global Terrorism Database

I have also used descriptive statistics in this dissertation. Data comes from the open-source Global Terrorism Database, GTD, which is housed at the National Consortium for the Study of Terrorism and Responses to Terrorism (START) at the University of Maryland. The database includes terrorist incidents since 1970. It is considered to be the most comprehensive open source database on terrorism, and it is frequently used by scholars in order to analyze terrorist activity (LaFree and Dugan 2007). Databases on incidents of terrorism play an increasingly important role in the terrorism studies field. However, there are well-known methodological challenges associated with them. Above all, researchers frequently emphasize the fact that terrorism represents a type of violence that is difficult to both define and measure. Accordingly, collecting valid data poses challenges. GTD and other terrorism databases rely on media reporting, which means that how the media reports events is very important. Without a doubt, there are many uncertainties associated with data from these databases. My approach to this has been to present the incident trends on rail bound traffic with as much transparency as possible; i.e., I am open about how I have interpreted the data from GTD.

6.4.4 Sources to improve contextual understanding

In addition to written documents and interviews, I have participated in different forums, and this has given me a richer contextual understanding of central components of the research topic. As mentioned, there is a need to reduce the gap between scholars and practitioners. Accordingly, there is a need to interact with people working at the organizations being studied, and doing so is inspiring and enriches contextual understanding. One example of this is a two-day workshop that some colleagues and I organized with the central actors in Swedish rail bound traffic in order to communicate our research results and discuss how they view the current situation as regards threats against rail bound traffic. I have also participated in workshops and observed crisis exercises and training sessions – for example, training aimed

at rescuing people following a train crash (in Revinge, Sweden in 2011), an exercise on evacuating people from a subway train after a terrorist attack (in Philadelphia, USA in 2013) and a workshop looking at inter-organizational collaboration after a bomb explosion in a train station (in Gothenburg, Sweden in 2013). Such observations generate very concrete knowledge about the critical sequences involved in a response, which is something that cannot be obtained through written documents or previous research.

Having completed a discussion of the different methods and material I have used, we can turn to the question of quality in research. The principles of reliability and validity are often used as a way to evaluate the quality of a piece of research. In general terms, reliability is about the replicability of research findings, i.e., if the findings would be the same if another study using the same or similar methods were conducted. Seale (1999:158, cited in Lewis and Ritchie 2003) states that good practice in relation to reliability refers to “showing the audience of research studies as much as possible of the procedures that have led to a particular set of conclusions.” I have adopted such an approach; therefore, I have sought to be transparent and, as much as possible, to describe my research procedures. I have transcribed interviews, presented analytical themes and provided a detailed description of the particular scenario-based methodology I use.

Validity is about what can be described as the precision of research (Lewis and Ritchie 2003), or, put differently, about whether the researcher actually examines what she/he intended to research (Esaiasson et al. 2012). One way to enhance validity is to use different sources of information, thereby providing a rich account of the phenomenon of interest. I have strived in such a direction, and my research design required a combination of methods and material that, in the end, made it possible to examine the research topic from different perspectives. This can be understood as a form of triangulation. And as Lewis and Ritchie (2003-275) state, “triangulation assumes that the use of different sources of information will help both to confirm and to improve the clarity, or precision, of a research finding.” In my research, variation of sources has proven very useful. For example, the way in which preconditions or a certain obstacle to inter-organizational collaboration was expressed and understood in a national strategy could later be discussed in an interview and, finally, be observed/carried out in a training exercise.

6.4.5 A note on conducting crisis management research

It is always important to scrutinize one's sources and reflect upon one's role as a researcher. The first point to be made in this regard is about access to information and the kind of information one can obtain. As regards the

empirical core of the dissertation – i.e., the interviews – a majority of the persons I contacted agreed to participate. Thus, there is no sign of so-called research fatigue, defined as a fading interest in participating, which can be a problem in certain research settings. The overwhelmingly positive response most certainly relates to the fact that this particular research topic is rather unexplored in Sweden, and the relevant actors consider it important to participate. In the few cases in which people have been hesitant to participate or address certain themes, they have referred to the sensitivity of the topic of terrorism and crisis management. Related to this, I am aware that there are additional practices in place designed to prevent or respond to terrorism in Sweden – for instance, within the intelligence and law enforcement communities – which I cannot get information about. Moreover, my own impression is that in some of the interviews, the respondent felt uncomfortable talking about a lack of security or crisis management routines, and presented instead an ideal picture when speaking on the record, and a different one when speaking off the record.

Finally, as regards another matter, it is beyond the scope of this dissertation to examine the role of gender in crisis management. However, it must be mentioned that out of a total of 26 interviews, only three of the respondents were women. I am not aware of how representative this is for the crisis management field in general, I can only stress that the potential implications of this observation are worthy of future attention.

7. Summary of appended papers

The following section summarizes the five appended papers. From different angles, they each contribute to the overarching aim of the dissertation, which is to *analyze how public and private organizations prepare for and respond to crises emanating from terrorism targeting rail bound traffic, and to unravel and discuss current practices and the obstacles they create for inter-organizational collaboration*. Papers I and II explore both the phenomenon of terrorism targeting rail bound traffic and experiences of responding to its consequences from an international perspective. Papers III, IV and V present a detailed and in-depth case study of Sweden, exploring the country's current practices to enhance preparedness for an attack on its rail bound traffic. The main findings of the papers are highlighted below. I will return to these results in the concluding discussion.

7.1 Paper I

The first paper examines the phenomenon of terrorist attacks targeting rail bound traffic and how it has developed over time. Previous research has devoted extensive attention to terrorism targeting other forms of public transportation, including aviation and buses. Despite its inherent vulnerabilities, less attention has been paid to rail bound traffic. Using data from the Global Terrorism Database, this paper presents an empirical overview of the frequency and characteristics of attacks on rail bound traffic from 1970 to 2010, thereby providing us with a much-needed all-encompassing picture of attacks targeting this particular transportation sector.

The empirical overview addresses terrorist attacks on rail bound traffic in terms of incidence trends, geographic distribution of attacks, terrorist groups responsible for the attacks and modus operandi – including how the attacks were carried out, prime targets and number of casualties. The empirical overview also identifies the 20 largest-scale attacks on rail bound. The paper's results are interpreted through the lens of the contemporary terrorism paradigm, which is a scholarly debate concerning the contested concept of terrorism and assumptions about how contemporary terrorists organize their activities. Contemporary terrorism is assumed to be transnational; it is frequently religiously motivated, and represents a shift towards indiscriminate killing through the use of new tactics and weapons.

The findings of paper I indicate that the majority of the 1122 attacks that have targeted rail bound traffic are small and not characterized by the features said

to be inherent in contemporary terrorism. Rather, they are minor attacks with few casualties and are carried out by many different kinds of terrorist groups. They are geographically diverse and tend to target different parts of the railway infrastructure. However, the findings also indicate that we can identify an increase in major, high-profile cases: nearly half of the 20 largest-scale attacks occurred after 2001. These attacks use a modus operandi designed to create as much destruction and fear as possible, including coordinated bombings resulting in multiple incident sites and attacks during rush hour in crowded spaces in order to maximize the number of casualties. Hence, based on the empirical overview and the conceptual debate concerning what constitutes contemporary terrorism, paper I distinguishes between a large number of small attacks that are only partly characterized by the four main features of contemporary terrorism, and a smaller number of large-scale events whose characteristics are in line with the assumptions about contemporary terrorism. Knowledge about the characteristics of terrorism targeting rail bound traffic is important for scholars and practitioners who want to enhance security and organizational crisis management response capacity.

7.2 Paper II

The purpose of the second paper is to better understand the challenging task of planning and carrying out effective crisis management. In particular, it draws attention to medical care following crises caused by terrorism. Paper II employs a comparative perspective to examine previous international experiences of responding to large-scale terrorist attacks targeting rail bound traffic. The cases included in the paper are the sarin gas attack on Tokyo's subway system in 1995 and the bombings on commuter train systems in Madrid in 2004, London in 2005 and Mumbai in 2006. Analytically, the starting point of the paper is the observation that there is an extensive body of research addressing terrorism from different perspectives, as well as research focusing on understanding responses to crises and disasters; however, there are surprisingly few comparative studies. In particular, only a few comparative studies focus on the question of how actors responded to terrorist-induced crises on rail bound traffic. In addition, there has been discussion in the scholarly literature about whether we have the analytical tools necessary to grasp present realities of current crises, including low probability-high consequences events.

A comparative perspective is important because it draws attention to potentially recurring critical points in crisis management processes, which are central factors in discussions about the extent to which experiences and practices from a particular case can be generalized. Accordingly, building on

previous research and six explorative interviews, paper II captures important management challenges at different levels of response, thereby contributing to the development of a framework for categorizing and analyzing different aspects of the often complex responses to terrorism on trains and subways.

The results of paper II show that there are recurring management challenges in all four cases. Above all, a central finding of the paper is that decisive components at the operational response level relate to agent-generated demands, i.e. additional difficulties in these cases were created by the specific terrorist context in which the crisis occurred. Another of this paper's results pertains to the strategic level: several successful elements relating to collaborative actions were identified. These include rapid recognition and declaration of a major incident, agreed-upon command and control structures, limited confusion over roles and responsibilities and coordinated media messages. At the national systemic level, the research in this paper draws attention to structures and crisis management cultures, and in particular shows the importance of investing time and resources into crisis management planning as well as being proactive in response to the ever-changing character of crises.

Hence, paper II confirms the value of detailed comparative analyses for discerning recurring challenges pertaining to different levels of response. This is particularly important for the purpose of refining our analyses and avoiding overly-general accounts or black and white assessments of crisis management processes. Moreover, paper II demonstrates that it is crucial that knowledge about and awareness of identified challenges at different response levels are incorporated in training exercises and response plans for future crisis management.

7.3 Paper III

The purpose of the third paper is to analyze how and why Swedish counterterrorism policy has changed since 2001. In terms of its importance for ongoing scholarly discussions, this paper captures central aspects relating to how the policy field of counterterrorism interacts with other factors on the government agenda and how priorities made in counterterrorism can be understood in the perspective of crisis prevention and mitigation. Hence, drawing on the intersections between concepts and perspectives used in terrorism studies and disaster and crisis management research, paper III uses central documents in Swedish counterterrorism and annual reports from the Security Service (2001–2013) to investigate how terrorist threat articulation has changed over time and how institutional innovations have come about.

The findings of paper III reveal some distinct qualitative turning points in counterterrorism policy, which makes it possible to identify a rough periodization. During the period *2001-2009*, the focus of counterterrorism was on threats from organized international terrorism. The terrorist threat was construed as extraterritorial, and the primary potential targets were foreign interests located in Sweden. The period *2009-2012* represents a significant policy shift, as lone-wolf terrorism and the domestic sources of terrorism began to displace prevention in Swedish counterterrorism. In particular, the first suicide bomber on Swedish soil, in December 2010, and the Oslo bombings in 2011 served as focusing events. The overall characterization of the terrorist threat became blurred and began to circulate around a terrorist threat from within. Swedish counterterrorism policy took an intellectual leap from prevention to mitigation, encouraging participation by and collaboration among a number of actors in society. This was also mirrored in institutional change, most notably the establishment of the Swedish Counter-Terrorism Cooperative Council. The period *2012-2014* seemed to pivot around a clash between prevention and mitigation. In the view of policymakers, the threat of so-called facilitators of terrorism – including Swedish citizens travelling abroad to engage in illegal or terrorist activities – overshadowed other aspects of the overall terrorist threat against Sweden. Thus, the current terrorist threat is perceived as coming from within Swedish society, but also as including significant international linkages. As a result, the mitigating role of civil actors and Swedish society at large has been further enhanced. Hence, paper III demonstrates that the dominant understanding of the terrorist threat against Sweden has changed rather significantly since 2001. It also suggests that we can see a shift in policy focus, with the Swedish government moving from distinctly preventive assumptions about how to best combat terrorism towards an increased emphasis on mitigation efforts.

7.4 Paper IV

The fourth paper aims at exploring current Swedish preparedness practices aimed at preparing responsible actors to respond to a large-scale terrorist attack on rail bound traffic in a collaborative manner. This paper's point of departure is that neither scholars nor practitioners have paid much systematic attention to the pressing question of Sweden's capacity to respond to a terrorist event focused on the railway system. Some guidance can be found in national publications and risk and vulnerability assessments that indicate that rail bound traffic is a likely target for terrorism and that the consequences can be far-reaching if an attack takes place. However, relying on scenario-based interviews, this paper provides a much needed empirical contribution by analyzing how central public and private organizations perceive their own organizational preparedness to respond to such an attack, and, above all, how

they view current practices to adopt an inter-organizational, collaborative approach to crisis management.

From a network perspective, this paper identifies and analyses current practices and obstacles to inter-organizational collaboration. Practices that the respondents view as promising include an increased risk awareness, a willingness to collaborate among different organizations and the establishment of formal collaboration forums. In terms of obstacles to inter-organizational collaboration, three main findings should be highlighted. First, ongoing collaborative efforts to prepare for responding to a terrorist attack are, to a large degree, carried out in different subnetworks or “silos.” Thus, networks with their own sets of behaviors and norms work side by side, but they do not necessarily interact with each other on a deeper level. Second, actors find it difficult to translate the concept of inter-organizational collaboration into actual practical actions. Thus, despite resounding support for collaborative activity, the findings of the paper clearly indicate that there are uncertainties as regards *how* the concept can be translated into action. Theoretically, and third, whereas network concepts contribute to our understanding of inter-organizational collaboration by sharpening our analysis of potential obstacles, it contributes with less regarding promising practices. This paper concludes by identifying a paradox: if actors continue to carry out collaborative actions primarily in isolated “silos”, then this will hinder the ability of organizations to grasp the broader and more complex response network and to establish inter-organizational collaboration among the many actors who are necessary participants in a response to terrorism targeting rail bound traffic.

7.5 Paper V

The fifth paper focuses on the role of Swedish rail bound traffic actors in crisis management. It sets out to examine different kinds of vulnerabilities in preparedness for terrorist-induced crises targeting rail bound traffic. The paper’s point of departure is the observation that a paradox seems to exist. Society is increasingly interconnected and there are important dependencies in critical infrastructures. While this seems to lead to the conclusion that critical infrastructures require a unified management, what we actually observe is increased organizational fragmentation. Rail bound traffic is largely privately owned and consists of a multitude of different actors. A similar development can be observed in the crisis management environment. In addition to specialized crisis management actors, it is assumed that other stakeholders, for example, private actors, will participate in collaborative actions if a major crisis occurs. The process towards a greater number of participating actors and increased fragmentation raises questions about the

possible implications of this development for crisis management. It is an issue which merits further attention.

Relying on interviews with actors from rail bound traffic and Sweden's crisis management system, the paper focuses on different actors' own perceptions of their preparedness. The concept of vulnerability, which has gained prominence in disaster and crisis research, is used in order to capture and explore different kinds of vulnerabilities in today's preparedness.

The paper shows that a number of obvious security vulnerabilities currently exist. Trains and subways are inherently difficult to protect from attacks. A traditional approach to analyzing transportation systems and their proneness to hazards is to focus on technical aspects of security or physical structures in prevention and preparedness. This paper contributes another perspective by revealing that involved actors not only understand vulnerabilities in preparedness to be a matter of shortcomings in technical security systems or in the ability to secure trains from acts of antagonistic violence. Rather, they identify two additional significant vulnerabilities. First, increased fragmentation in the sector is perceived as creating vulnerability in crisis management preparedness. The fragmentation is manifest, for example, in an unclear division of responsibilities, lack of overview and supervision over a multitude of actors, and the absence of a unified approach about how to prepare for this type of terrorist-induced crises. Second, the failure to ensure that relevant actors have a cognitive and mental preparedness is seen as creating vulnerability. This is manifest, for example, by the existence of a reactive approach to major crises and by the fact that actors in the rail bound traffic system are unfamiliar with how to operate in highly chaotic situations, particularly over a sustained period of time.

8. Preparing for and responding to terrorist-induced crises on rail bound traffic – concluding discussion

As has been illustrated, terrorism is a major global concern, and countries are therefore constantly trying to develop countermeasures and response capacities. The success or failure of such efforts to protect society from harm depends in large part on the efficiency and effectiveness of organizations. Accordingly, this dissertation set out to develop a better understanding of responses to terrorism from an organizational and a managerial perspective. The overarching purpose was two-fold: *to analyze how public and private organizations prepare for and respond to crises emanating from terrorism targeting rail bound traffic, and to unravel and discuss current practices and the obstacles they create for inter-organizational collaboration.*

We have now come to the final part of the dissertation, where the different pieces will be brought together. I will answer my four research questions and then conclude this section with a list of seven main challenges related to Sweden's current practices, networks and ideas as regards inter-organizational collaboration.

8.1 How has the phenomenon of terrorist attacks targeting rail bound traffic developed over time?

This dissertation has focused on a particular type of crisis: terrorist attacks targeting trains and subway systems. On a general level, most scholars, policymakers and practitioners agree that rail bound traffic appears to be at risk for terrorism. However, up to now, there has been no shared view of *how* rail bound traffic has become at risk for attacks or how attack patterns have developed over time. Accordingly, the first research question in the dissertation asked how the phenomenon of terrorism targeting rail bound traffic has developed over time. This question was mainly answered in paper I by providing an empirical overview of attacks internationally over the period 1970-2010.

Based on this analysis, the dissertation shows that the phenomenon of terrorist attacks targeting trains and subways is a global concern. Attacks occur in different parts of the world, and have done so since 1970, when terrorism began to be registered systematically in research databases. The fact that attacks on rail bound traffic is a global concern relates to the general view among scholars that terrorism has become transnational in character.

However, if we only emphasize the transnational component of current terrorism in general terms, this gives us limited guidance about how we can interpret these manifestations of political violence. Therefore, in order to analyze the global problem of terrorism targeting rail bound traffic in a systematic way, I have turned to terrorism studies and the paradigm *contemporary terrorism*. This paradigm assumes that today's terrorism shares four main features: terrorism operates transnationally; today's terrorist attacks are religiously motivated; terrorists seek weapons that can be used to attack as many people as possible, and the victims of contemporary terrorism are not carefully selected; rather, violence is indiscriminate.

In answering the first question, I have shown that the phenomenon of terrorist attacks on rail bound traffic has taken two different development paths. *First*, an overwhelming majority of the 1122 attacks since 1970 targeting trains and subways can be categorized as small ones that resulted in few casualties and limited infrastructure damage. These attacks are not characterized by any major changes in modus operandi over time. The majority of these small attacks have occurred in a limited number of countries and at different times over the forty years between 1970 and 2010. These clusters of countries are parts of regions that have suffered from instability and conflict. Accordingly, my conclusion is that a majority of the small attacks on rail bound traffic follow ongoing conflict patterns in different regions, and the purpose of the attacks appears to have been to disrupt or destabilize an ongoing conflict rather than to produce mass-casualty events with international ramifications.

Second, the other development path I have observed pertains to a small number of large-scale attacks whose characteristics resemble the four main features of contemporary terrorism. In contrast to the smaller attacks, these large-scale events demonstrate major changes over time. When these attacks occur, they result in complicated mass-casualty situations with an increasingly high number of casualties. A striking development is that the average number of people injured in each attack has increased five-fold since 1970. Moreover, almost half of the 20 largest-scale attacks on rail bound traffic have taken place since 2001, suggesting a concentration of mass-casualty events in recent years. A much-cited observation by Jenkins (1977) states that, "terrorists want a lot of people watching—not a lot of people dead." The relevance of this observation is affirmed in the majority of attacks between 1970-2010. However, when it comes to the largest-scale attacks, those which follow the second development path and are the focus of this dissertation, his observation is outdated. In fact, it can be argued that we are currently witnessing a new version of Jenkins' observation: *terrorists want a lot of people watching and a lot of people dead.*

Looking at the two development paths together, we can conclude that my findings about this type of terrorist attack (i.e. targeting rail bound traffic) support previous international research on terrorism, which shows that most terrorist attacks (taking all types of terrorist attacks into consideration) do not produce a large number of casualties. Rather, highly lethal attacks are rare, although when they do occur they have enormous consequences in terms of suffering and societal costs (see, for example, Lafree and Dugan 2007, START backgrounds reports). In addition, my empirical overview has provided support for the argument put forth in much of the terrorism studies literature that states that terrorism which is motivated by religion tends to be highly lethal (see, for example, Hoffman 2006). Looking specifically at attacks targeted at rail bound traffic, I can conclude that religious terrorism is more lethal than other form of terrorism, for example, nationalist/separatist or communist/socialist terrorism.

Now that it has been established that the phenomenon of terrorist attacks on rail bound traffic has developed along two separate paths, a short note about the practical implications of this is in order. If we look beyond police intelligence operations aiming at thwarting attacks, we can conclude that from a *prevention* and *mitigation* perspective it appears to be extremely difficult to protect rail bound traffic from attacks. We know from the empirical overview that terrorists target different parts of this transportation sector. Although trains themselves are the most common target, train stations and railway tracks also receive a significant share of all acts of violence. Thus, the security mitigation efforts that are available, for example, random screening of passengers, video surveillance and removal of boxes for luggage storage to minimize the risk of hidden bombs, can never fully prevent attacks from occurring. They might have an impact in that sense that they make it harder for terrorists, and they might prevent smaller, less organized groups from carry out their plans. However, if a resource-strong terrorist group is committed to executing an attack aimed at causing a mass-casualty event, there is little evidence that technical-security mitigation measures can fully prevent such a group from succeeding. Consequently, from a *preparedness* and *response* perspective, it becomes even more important to develop a capacity to respond effectively if an attack takes place. If we continue to see a concentration of attacks that are aimed at causing a large number of casualties, we can anticipate the need for highly complicated response efforts in the future. This suggests that measures facilitating evacuation and rescue efforts in rail bound environments are imperative, and particular emphasis should be given to medical care, because there are opportunities to save lives even after a terrorist attack. Hence, the next research question posed in the dissertation is focused on the immediate operational challenges facing rescue

personnel who respond to large-scale terrorist attacks targeting trains and subway systems.

8.2 What are the main challenges in pre-hospital care following a mass-casualty attack targeting rail bound traffic?

Since the aim has been to improve our understanding of how organizations prepare for and respond to terrorism on rail bound traffic, we needed to unpack and analyze the most critical points in the actual operational management of such crises. This is particularly true because it has been confirmed throughout the dissertation that a terrorist-induced crisis that includes a complicated mass-casualty situation requires a response that is qualitatively different from a response to a familiar, recurring type of emergency. Hence, I posed a second research question aimed at identifying the main challenges for pre-hospital care following a mass-casualty attack on rail bound traffic. The answer to this question is largely based on the findings discussed in paper II.

The second research question was answered by drawing on insights from four international response experiences: the sarin gas attack in Tokyo's subway system in 1995 and the bombings on commuter rail systems in Madrid in 2004, London in 2005 and Mumbai in 2006. A comparison of previous international experiences reveals just how demanding rescue efforts following terrorist-induced crises are. Pre-hospital medical care is of utmost importance, because it is foremost through the rapid rescue efforts of first responders that lives can be saved and suffering can be limited as much as possible. However, responding to a situation with a large number of casualties is very demanding in terms of performing triage, carrying out life-saving measures and coordinating resources. Such tasks are often conducted with limited resources and during circumstances of uncertainty and time pressure.

Based on the comparison of the four international response experiences mentioned above, my argument is that we need to recognize that, in addition to well-known management challenges such as the three just mentioned, *additional* complicating factors are part of the crisis management processes when the response occurs in a terrorism context.

First, if a multi-site terrorist attack takes place, it will create several incident sites, which tends to make it extremely difficult for first responders to develop an understanding of the situation they face. It is challenging to grasp the extent and nature of the attack and to distribute resources and establish command structures at several parallel sites. Second, following acts of

terrorism, scene safety emerges as particularly precarious. The existence of secondary devices and exposure to dangerous substances are examples of the risks facing both rescue personnel and victims. This also affects how assembly points and hospital tents are established. Third, security concerns call for rapid scene-clearance, which, in turn, poses additional challenges because it leads to significant and rapid surge at hospitals. Fourth, the modus operandi of different terrorist groups results in specific injury patterns. In the case of the four international experiences studied in paper II, injuries were mainly caused by chemical substances or bomb explosions. Such injury patterns create additional concerns. For example, persons injured in bomb explosions or shootings tend to bleed to death; thus, rapid action is needed. It is reasonable to assume that such injury patterns are far removed from what most medical services encounter on a daily basis. Instead, they are more often associated with injuries patterns commonly found in war-zones.

8.3 Who are the main crisis management actors, organizations and processes in Sweden in the event of a terrorist attack on rail bound traffic, and how do the different actors perceive their capacity to respond to such a crisis in a collaborative manner?

The two previous questions focused on characteristics of the phenomenon of terrorism targeting rail bound traffic and international experiences of responding to large-scale attacks. It is now time to turn to the Swedish case study, which is the subject of papers III, IV and V. At the beginning of the dissertation, it was established that there are many uncertainties about Sweden's crisis management practices, networks and ideas underpinning collaborative efforts to respond to a major terrorist attack. Hence, an empirically driven, third research question was developed for the purpose of gathering such information. The first aspect of the research question concerns the types of actors that are involved in preparing for and responding to an attack in Sweden. The scenario of multiple bomb explosions revealed the main actors in the event of a crisis on the scale of the one depicted in the scenario. It also demonstrated the need for collaborative action across sectors, at different levels of response as well as at different temporal stages of the crisis process. This organizational complexity, in combination with the unpredictability characterizing terrorism, makes it impossible to identify a response network with an exact set of actors that covers all phases of the crisis process. Rather, it can be concluded that the number of actors increases incrementally as the crisis process unfolds. In addition, three sub-networks were identified: (i) a network consisting of intelligence and/or secret service actors, (ii) a network consisting of the crisis management structure and (iii) a network consisting of rail bound traffic actors.

The emergence of these sub-networks is a good illustration of some of the large, general transformations taking place in both counterterrorism and crisis management. Paper III shows how the focus of counterterrorism efforts has increasingly shifted towards domestic and homegrown forms of terrorism. In the case of Sweden, I have concluded that the focus of intelligence actors has successively shifted from preventive efforts towards a more clearly stated mitigation stance. Therefore, there is a stated focus on cooperation and collaboration with a multitude of agencies and civil society actors in order to get at the problem of terrorism. In organizational terms, this means that an increasing number of actors are allowed to participate in efforts to prevent and mitigate terrorism. A similar development has been noted in the crisis management sphere. Papers IV and V clearly showed the high degree of decentralization characteristic of current crisis management and the extent to which the government is increasingly reaching out to organizations other than specialized crisis management actors in order to meet today's threats. Volunteers, non-profit organizations, the private sector and even individual citizens are now encouraged to participate in the process of enhancing societal security. Looking specifically at the private sector in the case of rail bound traffic, the environment continues to be fragmented, which adds further complexity. Hence, when developments in the counterterrorism field are merged with the crisis management sphere, the message conveyed is that when public and private organizations prepare for managing terrorist-induced crises, they do so in an environment that includes an increasingly large number of actors engaged in efforts to prevent, mitigate, prepare, respond and recover from crises. Hence, it very clearly exemplifies the overarching international trend in crisis management, which is an increased whole-of-society approach (Handmer and Dovers 2013).

The second part of the research question concerns how different actors perceive their capacity to respond to a crisis in a collaborative manner. I have frequently referred to government documents or risk and vulnerability assessments, all of which state that the threat of terrorism is one of the many threats requiring crisis management preparedness. However, these sources of information tend to revolve around terrorism as a phenomenon or its potential consequences. Discussions about the actual preparedness or response capacity of organizations were less common. Moreover, following the argument that we are experiencing an increasingly multi-faceted counterterrorism and crisis management environment, an obvious question that arises is whether all actors pull in the same direction? The following section will discuss the fact that collaborative crisis management processes encompass several different types of challenges and show that organizations do indeed express diverging views.

	Prevention	Mitigation	Preparedness	Response	Recovery
Intelligence and police agencies	A successive shift towards increased mitigation efforts requires actors more involved in society, challenges arise in terms of information sharing and accountability		Challenge to work with different types of organizations	Main challenge is to respond to separate terrorist events	Previous events have illustrated a weakness in being resilient as regards resources
Crisis management organizations -operational level	Uncertainty regarding the need to undertake specific terrorism-related prevention, mitigation and preparedness activities			Limited systematic approach to scene safety Lack of resources when responding to parallel incident sites	One week of intense work is estimated to be the limit
Crisis management organizations -regional level	Limited capacity to receive and interpret intelligence-based information and to turn information into mitigation efforts	Need for enhanced knowledge about terrorism Inter-organizational collaboration still needs to become more concrete as regards its forms and goals	Assumed lack of personnel in the initial stage of a crisis Difficulties to establish a situational awareness Collaboration still depends on individuals		A systematic societal approach to recovering needs further attention Uncertainty concerning leadership to bring society back to normal
Crisis management organizations -national level	Highly difficult to fully prevent attacks on rail bound traffic	Limited mitigation efforts such as screening of passengers, removal of luggage lockers and surveillance	Confusion of roles and responsibilities creates a vacuum of uncertainty about how rail bound traffic actors should prepare for antagonistic threats	Diffuse and major variation regarding what different organizations expect from the national level in the response phase Information sharing among a large number of rail bound traffic actors is considered critical	There are few mechanisms in rail operators' license or their procurement that prepare them for dealing with extraordinary situations and resuming operations quickly
Rail bound traffic actors					

Table 3. Identified challenges in preparing for and responding to terrorism targeting rail bound traffic

Table 3 shows that different sub-networks face different types of challenges. It should be noted that several organizations face the same critical activities and challenges and that the boundaries between phases and sub-networks are not always precise. Nonetheless, on a general level, we can identify recurring challenges that are different in character and that pertain to *knowledge, resources and collaborative problems*.

When enhancing the capacity to respond to terrorist attacks on rail bound traffic, public and private actors must pay attention to factors relating to *knowledge*. Papers III, IV and V all show that challenges are linked to the unfamiliarity of responding to crises caused by antagonism and to truly extraordinary crises. We can therefore conclude that an assumed paucity of experience problem exists and that it matters. There is a lack of mental and cognitive preparedness for such events, and, consequently, there are differences of opinion about preparedness. Some argue that terrorism needs specific attention in terms of increased knowledge and specific training and exercises, while others argue that it is sufficient to include terrorism-induced crises in the all-hazard approach, i.e., one should prepare for them in the same way as one prepares for all other types of threats.

The interviewees also assume that a lack of mental and cognitive preparedness has implications for the operational phase of a crisis. Interviews have pointed out that a lack of understanding of the dynamics of terrorism-induced crises can lead first responders to overlook scene-safety concerns when they enter incident sites. Hence, their often very rapid response can become a vulnerability. How the first front-liners decide whether or not an event is a terrorism-induced crisis is pivotal both for their own safety and subsequent actions in the response. Given the research findings in paper II, which revealed that terrorism-induced crises are characterized by additional complicating crisis management factors, the observed ambivalence among actors in Sweden about how to prepare for this particular type of crisis is rather surprising and signals a need for further research.

When analyzing how public and private actors organize their collaborative efforts, we cannot neglect the factor of actual *resources*. In particular, one pressing need is resources to pay for preparedness tools such as continuous knowledge building, training and exercises. The international experiences addressed in paper II clearly underline the importance of well-trained staffs and organizations. In this regard, the organizations studied in papers III, IV and V illustrated different approaches. Intelligence and police agencies exemplify one end of the spectrum, frequently carrying out training activities and discussing antagonistic threats and terrorism. First responders are also training-intensive organizations, i.e., they prepare to deal with a wide range

of emergencies and crises; however, they demonstrate differences as to whether their training and preparedness exercises include a specific focus on terrorist events. Rail bound traffic actors constitute the other end of the spectrum: they do not practice responding to terrorism-induced crises in a systematic manner.

These different approaches are partly explained by different roles and responsibilities, which lead the actors to devote different kinds and amounts of resources to training exercises. However, it is also a reflection of observed ambivalence concerning whether, and if so how and to what extent, organizations should prepare for antagonistic acts. Economic factors shape the preconditions for preparedness measures. Budget constraints, recurring re-organizations and lean organizations are realities that are perceived as fundamental obstacles. It is particularly difficult to invest resources in preparedness activities for a low probability–high consequence event. This problem is accentuated by the fact that no major terrorist-induced crises have taken place. In fact, there appears to be a general assumption that “something big must happen” before solid preparedness programs will be developed. Devoting resources to preparedness is particularly challenging for the actors that are not specialized in crisis management, most notably rail bound traffic actors. Their day-to-day reality is characterized by recurrent problems such as severe maintenance problems on the Swedish railways and cancelled and delayed trains, which diverts attention away from antagonistic threats in the form of terrorism.

Resources are also a critical factor in the operational management of terrorism-induced crises. One insight from international experiences is that although resources count, what is decisive is how they are actually put to use. This is important, because it is particularly difficult to decide how to use resources to respond to terrorist events involving several sites. However, although coordination appears to be at the center of the resource problem, there are also challenges linked to the question of what amount of resources are actually available. Not least, interviews for the Swedish case study pointed to weaknesses in estimating capacity, even when the question asked was what amount of resources a city or region has under normal circumstances. This can be exemplified with medical care. It is not the number of hospital beds in a region, per se, which determines how a mass-casualty event can be managed; rather, it is the number of hospital beds that can easily be made available during a crisis situation. Once again, the empirical material reveals different interpretations of the preconditions for and challenges of responding to an extraordinary event. There are those who believe that a major terrorist event can be handled within the scope of currently-available resources, while others are convinced that hard prioritizing must be done.

In addition to knowledge and resources problems, the empirical material also calls attention to *collaborative practices*. As previously mentioned, inter-organizational collaboration is often portrayed as a double-edged sword, and my empirical material supports this view. There is resounding support for the idea of inter-organizational collaboration, and, in general terms, the different organizations reported that they have witnessed an improved capacity and willingness to work together. Discussions about collaborative actions have also been emphasized recently in connection with Sweden's having suffered one of its worst forest fires in modern time, an event that led to critical evaluations of the collaborative actions carried out. Renewed discussions about military-civilian collaboration in Sweden have also contributed to an increase in general dialog on collaboration. Nonetheless, there are obstacles to collaborative practices. Despite their intentions to engage in effective inter-organizational collaboration, organizations feel that their efforts are partly hampered by uncertainties in organizing public administration and uncertainties in crisis management.

Papers III, IV and V clearly show that organizations are moving further and further towards partnership networks, and the underlying argument behind this way of organizing public administration is that flexibility and a multitude of actors are needed in order to deal with the ambiguity of crisis situations. However, such desired flexibility was also interpreted by the organizations as ambiguity. Above all, in terms of steering, the shift from government to governance has changed the role of government, and it implies that public and private actors are assumed to take responsibility and coordinate their collaborative efforts. However, my empirical material shows that organizations expect the government to take a more active role than the current system is designed for them to take. Public organizations at the local and regional level, as well as private actors, are looking for more guidance and direction about how to organize their preparedness practices for this particular type of crisis. However, at the same time, they are unsure as to which actor or actors they should turn to. (This is particularly obvious in the case of rail bound traffic actors.) Hence, despite the fact that Swedish crisis management is built around the idea of inter-organizational collaboration, current legislation provides very limited detailed guidance about *how* such collaboration is to be carried out in practice (see, for example, Civil protection act 2003:778, Act on municipal and county council measures prior to and during extra-ordinary event in peacetime and during periods of heightened alert 2006:544, Emergency management and heightened alert ordinance 2006:544).

Furthermore, collaborative challenges also pertain to the operational phase of a large-scale crisis and to the need for rapid action. Sweden has traditionally experienced smaller events that can often be managed on a local level alone. Severe events have often involved weather-related crises such as storms, floods or harsh winter conditions. Such situations have at least some degree of predictability, and it is possible to plan for collaborative response actions, at least partly. However, a terrorist attack on rail bound traffic is a sudden event that strikes without any warning; hence, the collaborative response needs to be activated promptly. Based on interviews and the logic of extraordinary crises, we must assume that a major terrorist attack on rail bound traffic that creates a mass-casualty situation would imply a shift in responsibility towards regional and/or national governmental authorities. Thus, in a crisis situation, there is a need to *up-scale*, and we know from previous attacks such as the Madrid and London bombings that a rapid up-scale was seen as one of the factors behind successfully responding. Therefore, perhaps the most striking finding from the Swedish case study is that there are many different views about how a large-scale terrorist attack can – or should – be managed across different levels of response and different sectors. For example, there are different views about when and under what circumstances the regional level should assume responsibility. Organizations have different views about the role of MSB and the government in times of crisis, and there are different opinions about what to do if hard prioritizing among sectors is needed. Such questions can and should be problematized and discussed as part of the preparatory phase during which actors plan how they will respond if a crisis occurs. However, during a rapidly evolving crisis situation, there is little time for such uncertainty. Accordingly, it is remarkable that there are no mechanisms in place to solve problems in the event that actors disagree on priorities or on what actions must be taken. This situation can be explained by and related to a broader discussion about the fact that Sweden's political and administrative systems does not allow for a combination of two approaches: one based on clear command and control, the other based on the idea of extensive networked collaboration (see for example Wimelius and Engberg 2014). Rather, Sweden relies on the latter. All participating organizations make their own decisions, and, as expressed in my interviews, they assume – or basically hope – that critical decisions will be made and problems solved through negotiation and consensus building. In other words, there is no hierarchy that designates which actor is superior to another, and this means that the Swedish political and administrative structure – and, in the end, the crisis management response structure too – is a rather special system.

8.4 How can current practices and the obstacles they create for inter-organizational collaboration in crisis management be understood?

The fourth research question is intended to shed light on how we can improve our analytical understanding of crisis management processes in an environment characterized by uncertainty. As stated previously, three guiding principles have informed my research: a multidisciplinary approach, a comprehensive perspective on crisis management and an ambition to work closely with involved stakeholders and practitioners. In answering this fourth and last research question, it is time to return to these principles.

First, I have suggested that in order to understand the many twists and turns associated with the crisis management processes surrounding terrorist-induced crises, one must be innovative and gather scholarly insights from different scientific disciplines, each with their own focus, perspectives and paradigms. In this dissertation, this has been exemplified by my understanding of crisis management as a broader organizational process through the lenses of crisis management research, terrorism studies and disaster medicine. I conclude that when analyzing how public and private organizations prepare for and respond to terrorism targeting rail bound traffic, it is necessary to pay attention to: (i) factors concerning particularities associated with the crisis agent itself, in this case terrorism (terrorism studies provide such guidance), (ii) factors relating to the need for rapid and effective management of a mass-casualty situation that requires extensive resources and specific knowledge about disaster medicine (research on disaster medicine offers such knowledge) and (iii) factors adhering to institutional complexity, which is assumed to characterize the overarching crisis management process – multiple and different types of actors at different response levels operating across sectors and temporal stages of a crisis (crisis management research provides such guidance). Combining these approaches has strengthened this dissertation. Most notably, terrorism studies provides information about the characteristics of terrorist events. When this knowledge was merged with a disaster medicine research focus on mass-casualty situations, I was able to discern particular response challenges that arise during on-scene management of the event. The disaster medicine literature is relevant to the broader crisis management literature because it underlines the particularities associated with a truly mass-casualty crisis. Including a disaster medicine perspective in the examination of inter-organizational collaboration also served as a reminder of the extreme urgency of prompt action and the essential task of saving lives. Literature on inter-agency relations during crises tends to revolve around communication, situational awareness and strategic decisions. Focusing on how operational responding

organizations perform during the first golden hour is a valuable addition to analyses of such collaborative actions. At the same time, the crisis management literature on organizational behavior gives the other two bodies of literature a broader perspective, addressing the preconditions for crisis management both before and after the crisis event. Hence, the three fields together form a basis for developing a better understanding of the convergence of organizations and actions that occurs in crisis management processes.

Second, I have argued that the analysis benefits from a comprehensive perspective on crisis management that involves all crisis phases. The phase model is a theoretical underpinning of crisis management; however, the acute response phase has undoubtedly received the most attention, often based on the argument that response actions are the most complex. To balance this focus, several studies have also concentrated on how specialized crisis management organizations prepare for crises. In addition, a new turning point can be identified. The extensive, ongoing scholarly discussion about the concept of resilience suggests that many observers believe that crises cannot be prevented, and, as a result, focus is shifting to how we can manage their long-term consequences. Research with an in-depth focus on specific crisis phases is clearly necessary and important. At the same time, however, my five papers also demonstrate the benefits of studying a complex crisis phenomenon from the perspective of different phases.

The research presented in this dissertation has made it possible to uncover intersections between phases and categories of organizations. Hence, it shows that we can develop a better understanding of identified challenges to current practices in inter-organizational collaboration if we pay closer attention to two interactions. The first is the interaction between security and safety professionals. Given the antagonistic element of terrorist-induced crises, security professionals and intelligence and police authorities play a prominent role. When and how they are allowed to share, communicate, and collaborate around sensitive information is crucial, as is the capacity of safety professionals to receive and act upon such information. Second, the interaction between organizations with and without experience operating in chaotic and uncertain circumstances is important. Organizations differ profoundly in their experience of acting under chaotic circumstances. Hence, they have different perceptions of what to expect following a terrorist attack and, thus, how to prepare to do so. This division is most apparent between first responders and actors in the private sector, in this case rail bound traffic operators, who are not exposed to major crises on a regular basis.

In addition to contributing to our understanding of important intersections, the analysis of inter-organizational collaboration presented in the dissertation also shows that crisis phases are related to different organizational skills. For instance, prevention and mitigation require analytical and policy-making skills aimed at preventing a threat from turning into a crisis. Preparedness and response personnel need training and technical skills as well as skills related to operational decision-making. Long-term recovery efforts or actions aiming at enhancing resilience require analytical evaluative skills focused on societal recovery. Hence, the organizational skills required to successfully engage in inter-organizational collaboration are manifold.

Third, I have stressed the importance of working closely with involved stakeholders and practitioners when conducting crisis management research. Doing so has enabled me to gain valuable knowledge about the ideas underpinning inter-organizational collaboration, and, above all, greater understanding of how the concept is used in practice. As stated early in the dissertation, scholars emphasize a collaboration puzzle. Part of the problem is the fact that analytical conceptualizations of inter-organizational collaboration deviate from the way in which the concept is used in crisis management practice. My empirical material provides support for the view that there is, indeed, a difference in conceptualization. This is not a surprising result, nor is it surprising that different categories of actors have different perceptions on collaboration. What is surprising, however, is the very *widespread use* of the concept of inter-organizational collaboration. The mere articulation of the concept is assumed to signal action and solve complex problems. Hence, I argue that the concept is imbued with normative rather than practical meaning (see also Danielsson, Johansson, Kvarnlöf, 2013). The concept has become an end in itself. This is echoed in how organizations talk about promising practices of collaborative actions, which often are expressed in terms of a *willingness, commitment, and/or intention* to collaborate more efficiently. Nonetheless, an intention to collaborate or an awareness of its importance is not the same thing as actually performing collaborative actions. A paradox seems to have arisen. The louder the support for the idea of inter-organizational collaboration is, the less attention is paid to scrutinizing the *practical* implications of the concept. The presumed benefits of inter-organizational collaboration are more or less taken for granted and are assumed to hold in a crisis situation.

In sum, my argument is that in our endeavor to improve our understanding of current practices of inter-organizational collaboration in crisis contexts, our analyses benefit from gathering insights from different fields of research (as opposed to applying only one specific perspective). In addition, we must look at multiple crisis phases (rather than only focusing on inter-agency relations

in, for instance, the response phase). Finally, it is informative to interact with practitioners involved in the field (instead of simply relying on, for example, post-crises evaluations to shed light on inter-organizational collaboration).

Thus, my central argument is that it is not possible to grasp and understand challenges to inter-organizational collaboration in the context of terrorism targeting rail bound traffic based on a single, specific perspective. Having said this, however, it should be noted previous research has argued that there is no coherent research field focusing on crises. Rather, the field of knowledge is said to consist of a set of researchers from a variety of different disciplines, all of whom emphasize their own perspective about how we can understand crises. It has been argued that a potential weakness of such a multidisciplinary or interdisciplinary approach is that it can create intellectual incoherence or ambiguity (Lalonde 2007). In response to this, having written a dissertation that relies on different fields, I would – on the contrary – underscore the importance of combining different perspectives when studying crises and their management and argue that the crisis management research arena appears to be flexible and open to multiple perspectives. It is important to note that the intersection of crisis management with other disciplines does not necessarily mean that crisis management is not, itself, a discipline (McEntire 2007). Hence, I believe that an increasing number of scholars interested in crises (regardless of their academic background) identify themselves as crisis management scholars and hold that this particular field of knowledge will continue to develop.

8.5 Challenges

The foregoing section provides an account of how both public and private actors are increasingly paying more attention to terrorist-induced crises, and we have established that there is resounding support for collaborative responses. However, it has also become apparent that collaborative actions are not easy to carry out. Hence, in our endeavor to understand and ultimately improve inter-organizational collaboration, we must spell out the challenges. I will therefore conclude my discussion of the Swedish case study by presenting seven main challenges to current crisis management practices in Sweden in the context of preparing for and responding to terrorism targeting rail bound traffic.



(Photo by: Andreas Strandh)

Challenge # 1 Vulnerability

The first challenge pertains to the transportation sector itself – i.e., rail bound traffic. Throughout the dissertation I have shown that rail bound traffic is difficult to protect from terrorist attacks. Terrorists target railway trains, subway trains, train stations, railway tracks and surrounding infrastructure. Therefore, the threat of terrorism directed against this transportation sector can never be entirely eliminated. Security and mitigation efforts cannot completely prevent attacks from occurring. Because terrorists attempt to strike at soft targets, including civilians, and thereby cause great suffering and societal fear, we must assume that rail bound traffic will to continue to be an attractive target for them. Adding to this is the dimension of critical dependencies – the potential for cascading effects due to the disruption or destruction of a critically important infrastructure such as rail bound traffic is significant. This, unfortunately, makes it even more likely that rail bound traffic will remain a likely target for acts of terrorism.

Challenge # 2 Resources

The second challenge to current collaborative crisis management practices is resources. Put somewhat bluntly, efforts to enhance crisis management preparedness are expensive, and the creation of a resilient organization or a resilient response system costs even more. The empirical material

underpinning the Swedish case study has shown that it is difficult for organizations to invest resources in and direct preparatory efforts (including training, education, workshops and exercises) at low probability–high consequence events. In general, organizations in the Swedish response system say that their resources are scarce, and the low probability–high consequence dilemma is accentuated by the fact that no major mass-casualty event has taken place in Sweden. It is extremely difficult for rail bound traffic actors in particular to devote resources to preparedness in the event of a terrorism threat in light of the fact that they face other challenges on a daily basis, including recurring disruptions of rail traffic and poor maintenance of the railway system. Moreover, my research has shown that it is not reasonable to assume that responding to a major terrorist attack can be managed in the same way as familiar emergency situations are, because doing so requires access to very particular resources (exemplified here by special hospital care and helicopters). Also, resources are needed across sectors and geographic locations. Particularly obvious is a lack of resources necessary to maintain the response operation for as long as necessary – i.e. to keep the response going over time. Hence, resilience from a resource perspective is, at present, limited.

Challenge # 3 Specific disaster medicine competence is required in order to deal successfully with mass-casualty situations

A third challenge relates to the intricate task of collaborating at the scene of the terrorist event. Even though the empirical material shows that there is a profound trust in how first responders operate under severe and chaotic circumstances, a mass-casualty event is a highly demanding situation for responding personnel. It differs from a routine event in terms of the need for massive rescue efforts, potential decontamination procedures, triage, evacuation and treatment of a flood of casualties. In a terrorism context, the demanding nature of rescue efforts is accentuated and responding may be delayed due to sense-making difficulties and dire security concerns for rescue personnel and victims. Education in disaster medicine, emergency drills, exercises and repeated training is therefore essential for strengthening the capacity to manage the many challenges associated with pre-hospital care and mass-casualty situations. In Sweden, as in many other countries, specific competence in disaster medicine remains a peripheral component of traditional medical education.

Challenge # 4 Fragmented response networks

A fourth challenge to inter-organizational collaboration is the very fragmented character of networks. This is particularly evident in the sub-network of rail bound traffic actors. The main challenge lies in the fact that private

organizations are assumed to engage and participate assertively in crisis management, yet there are few legal or formal mechanisms in place that regulate their behavior. Hence, in contrast to other type of actors engaged in, for example, providing electricity or transporting dangerous goods, there are few guidelines outlining how private actors are expected to operate and manage situations that fall outside of normal routines. There is also major uncertainty about whether rail bound traffic actors in Sweden should turn to the Swedish Transport Administration or the Swedish Transport Agency for guidance in matters relating to preparedness for acts of terrorism. Hence, rail bound traffic in Sweden is characterized by increased fragmentation due to an influx of new actors, while at the same time there is no agency with a clear, overarching mandate to regulate efforts to promote security and related crisis management.

Challenge # 5 Collaboration as commitment versus practice

A fifth major challenge is the seemingly major discrepancy between collaboration as a commitment and as actual practice. Even though inter-organizational collaboration has become part of the daily language of organizations, and there are an increasing number of formal collaboration and coordination forums, organizations find it challenging to turn the commitment to working together into actual practical action. Connected to this is the observation that the concept of inter-organizational collaboration appears to be understood primarily from a normative view, rather than from the point of view of its practical meaning. In addition, while both legislation regulating crisis management and central policy documents on crisis management tend to stress that Swedish crisis management is built around the idea of collaborative actions, they provide little guidance as to how inter-organizational collaboration is to be carried out effectively in practice.

Challenge # 6 Crisis management and level uncertainty

Another major challenge which has been identified is uncertainty about crisis management level. In essence, this uncertainty revolves around the fact that the type of crisis studied in this dissertation, i.e., a crisis that is an extraordinary event, differs profoundly from a crisis event that can be managed entirely at the local level. When the crisis overwhelms available resources and knowledge, the response needs to be expanded, both vertically (across levels of response) and horizontally (across sectors). The Swedish case study has shown that the national response system puts significant trust in the local level as a first line of defense in a crisis. However, the organizations studied express uncertainty regarding the hierarchical shift from the local

level to the regional level and the national level at which MSB is designated as responsible for enabling coordination and collaboration.

Challenge # 7 Discrepancy between policy-as-usual and crises-as-exceptions

The seventh challenge is connected to the previous one and can be described as a problem that arises from the fact that many actors understand crisis management as a policy area like any other. In the context of a large-scale, terrorist-induced crisis (or any other major cross-sectorial crisis), it is a problem that crises, defined here as exceptions or disruptions to normal routines, are supposed to be managed with a policy-as-usual approach. The entire response system is built on the idea of shared actions, trust, negotiations and consensus building. Hence, it is characterized by features that resemble those described in the governance literature, which stress the merits of networks. However, this literature appears to fall short when it comes to explaining emergent networks, or the need for very rapid network actions. Borrowing the term golden hour from disaster medicine serves as a reminder of the need for extremely prompt action. There are significant time constraints, even if we acknowledge that it might be acceptable for strategic and collaborative action outside the sphere of immediate medical care to take longer than an hour. From a management and accountability perspective, a highly decentralized approach that involves an increasing number of actors and is built around consensus making seems difficult to manage. In actual practice, in crisis situations, the organizations studied in this dissertation seem to rely on incremental development, i.e., development that requires a common situational awareness as a prerequisite to making unanimous decisions. This is difficult due to the inbuilt uncertainty of crisis situations and because it is time consuming (which is something that has been clearly demonstrated in previous crises such as the forest fire in 2014).

In essence, the building blocks of the current system fit poorly with many of my empirical accounts, in which organizations often express the need for clear command and control and decision-making procedures in times of major crisis. References to military structures have even been made. Thus, these views give voice to the argument found in research that what is needed in a crisis is collaboration led by an authority that can take control and lead the response (see, for example, Moynihan 2005, 2008). However, as already mentioned, the current system seems to hinder such a combination. Accordingly, at present, the biggest risk associated with a collaborative response is that the many participating organizations expect a major terrorist attack to be managed in a certain way – i.e., as a *crisis-of-exception*. Yet the

system is designed for a *crisis-as-usual*, and the response will be carried out in accordance with this.

Another way of illustrating the challenges that have been elaborated in this concluding section is to return to the fictional scenario that was introduced at the beginning of the dissertation. When I began my research, the fictional, mass-casualty situation prompted questions about Sweden's crisis management practices and the country's actual capacity to deal with a crisis on this scale. I have approached the Swedish case study from the perspective of three different sub-networks: intelligence and police authorities, the national crisis management response system and rail bound traffic actors. By combining the main results from these three sub-networks, I can present a more comprehensive picture of the scenario and how it is assumed to play out – i.e. what is assumed to happen if four bombs struck rail bound traffic in Sweden.

9 The scenario – what would happen?



A multi-site terrorist attack targeting Stockholm's rail bound traffic will require knowledge, resources and the activation of a large number of actors. (Photo by: Andreas Strandh)

During the last decade, the threat of terrorism in Sweden has become more significant and explicitly articulated by Säpo (Paper III). However, when four bombs target Stockholm's rail bound traffic, the attack comes as a surprise. During the short span of time between 08.12 and 08.16, four bombs explode almost simultaneously on *different* parts of the railway system. The first one explodes on a *SJ AB* passenger train while it is parked at the platform at the central train station, which is owned by *Jernhusen*. Two bombs then explode on a subway train traveling between two centrally-located, often crowded subway stations in downtown Stockholm – Hötorget and Rådmanngatan. The targeted subway train is run by *MTR Stockholm*. After this, an additional bomb explodes, this time on an *Arlanda Express* train on its way to the international airport. The powerful bomb causes the train to derail (Papers IV and V).

Chaos breaks out at the incident sites, and there are instant fatalities and injured in need of immediate medical care. However, it is not until later that the actual number of casualties can be determined: a total of 80 fatalities and more than 300 injured. There is a large number of walking wounded suffering from minor injuries and a great influx of persons trying to rescue people or figure out what is happening. The *operational level* of the organized crisis management response is immediately activated. Police, fire and ambulance

sirens can soon be heard approaching the sites, while first responders try to make sense of the situation. What is happening? What kind of situation are we actually facing?

SOS Alarm, the actor that answers emergency calls in Sweden, comes under great deal of pressure. Calls are received from different locations, and callers give different versions of the situation. It is particularly challenging to develop an overview of what is happening, because explosions have occurred at multiple sites. The mobile phone system is overloaded, and a major concern is that the enormous pressure on the communication system risks creating a communication failure.

The bomb explosions take place at locations in the city *center*; therefore, responding personnel reach the sites quickly. Some first responders suspect possible acts of terrorism, while others are unsure about the exact cause of the explosions. This early on in the response, responding organizations are not fully aware of the extent or antagonistic element of the situation. As a consequence, the front liners initiate their rescue efforts without any systematic approach to potential *scene-safety* issues. Will additional attacks occur? Is it safe to enter? Do the bombs contain a toxic or chemical gas? Although the chaotic scenes are overwhelming, the police, fire fighters and medical emergency personnel focus on *solving the situation, one way or another*, because they are trained to face demanding situations on a daily basis. Their goal is to prioritize life-saving measures. However, they encounter problems at the sites. An operational vacuum appears because there is confusion over whether the police should declare the area *safe* before fire fighters and medical emergency personnel enter (Paper IV).

It is difficult to provide a precise situational awareness. However, based on the chaotic environment and some first assessments, responding personnel conclude that they can expect a large number of fatalities and seriously injured persons. The deployment of *resources* becomes an immediately pressing issue. First responders at a strategic response level are forced to make prompt decisions about how resources should be distributed among the three different incident sites. Strategic discussions take place to ensure that all available resources do not go to the two first sites, thereby causing severe challenges for the third one. They soon realize that the available resources are insufficient for initial needs; thus, they face hard questions of priorities (Paper IV).

The bomb attacks target different parts of the train and subway system, thereby creating challenging *rescue environments*. The consequences of the explosions at the sites are significant, and in all cases, the explosions had force because they occurred in confined spaces. Passengers nearest the explosions

suffered the most, including loss of limbs as a direct consequence. Victims with lesser injuries try to open doors and escape the train wreckages. First responders must wait until the electrical current is switch off. The three sites have different transportation times to local hospital. The first site is located at the central station, which is above-ground and relatively open and accessible. However, the second location is underground between two subway stations, which means that the rescue environment is dark and difficult to access. Above all, it is time-consuming to enter the train wreckage and there are serious communication problems underground. There is a spontaneous evacuation of people in the subway tunnel, and the situation is initially tumultuous as people push to get out into the fresh air. Injured and choked passengers emerge from different ends of the underground tunnel, which results in additional gathering sites. The third site is located a short distance from the city center, and responding personnel face a physically demanding environment because the train has derailed (Paper IV).

Intensive efforts are made to save lives and mitigate the consequences of the explosions. In the midst of chaos, emergency medical personnel try to perform effective triage in order to decide the order and priority of emergency treatment and transport to hospital. *Rapid action* is needed. The terrorists have used bombs, which implies injury patterns typical of explosions. People risk bleeding to death if not taken care of immediately. In addition, as the response unfolds, the antagonistic element of the crisis becomes clear. This creates uncertainty and fear of further attacks. First responders operating at the different scenes are concerned both for their own and the victims' safety. The fear of additional explosions and the risk of overstretching staff and resource capacity leads to discussions that the incident sites should be closed as quickly as possible (Papers II and IV).

The Stockholm region is *resource* intensive; however, it soon becomes clear that there are limits even to what the capital can handle. All 30 fire stations in the city and about 70 ambulances have been alerted. Moreover, the police have roughly 70 vehicles as well as additional resources belonging to various special units. A process now starts to prepare the 7 emergency hospitals in Stockholm to deal with a flood of casualties. A somewhat lucky circumstance is that the bombings have occurred at eight o'clock in the morning on a workday. This opens up the possibility of calling in additional personnel. There are 3,200 hospital beds in the region, of which fewer than 100 are intensive care beds. In addition, there are about 200 health centers. However, medical response encounters challenges because these resources are already strained on a daily basis – they are by no means in *stand-by* mode. Access to intensive care beds is particularly challenging, because they are already being used by critically ill patients who cannot be transferred to other places without

difficulty. Sweden has limited airborne capacity, which is another complicating factor. There is only one ambulance helicopter in Stockholm, one in neighboring Uppsala and a total of seven in the entire country. The injury patterns caused by the explosions involve severe burns, and the severely injured must be transported to Sweden's two special units for burn injuries. These are located in Uppsala and Linköping, and the latter requires a helicopter for rapid transportation (Paper IV). In addition to severe burns, the injury patterns that the hospitals must deal with includes deep tissue damage that exposes internal organs, eye injuries and injures due to smoke inhalation.

Given the antagonistic element of the event, the police authority has a leading role and a major police operation is initiated. The Swedish Security Service and other parts of the Swedish police come under immediate pressure due to multiple demands, including finding the perpetrators, crime scene preservation and evidence collection. They also devote extensive resources to preempting further attacks and securing important buildings in the city center. The police urge the citizens of Stockholm to stay away from the epicenter of the crisis and keep calm. Nonetheless, there is general unrest as people seek information about the latest developments and try to get around in the Stockholm city center. As the situation develops, the police authorities experience enormous pressure to provide information, and the Swedish Counter-Terrorism Cooperation Council prepares to gather in order to communicate a coordinated message to the public (Paper III).

The directly affected rail bound traffic actors are SJ AB, Arlanda Express, MTR Stockholm and Jernhusen. The Swedish Transportation Administration decides to order a complete shutdown of rail traffic in Stockholm. This leaves thousands of people stranded without public transportation, which also has consequences for people traveling to work at hospitals and other central organizations, and thus unavailable to participate in responding to the crisis. Certain nodes, for example, the Swedish Transportation Administration, quickly become overloaded. People confuse the Swedish Transport Agency for the Swedish Transportation Administration, and, therefore, the former also receives plenty of calls (Paper V).

More than 250,000 people pass through the central station each day, and the rail bound traffic system in the region provides passengers with roughly 280,000 trips every day. Many of Stockholm's commuters are now directly affected by the closure of the system, and rail bound traffic actors start the process of trying to assist stranded passengers and plan for how and when operation can be resumed. The extent of the crisis leads most rail bound traffic actors to assume that it will take significant time before traffic is up and running again. Several of the key rail bound traffic actors also face immediate

security or practical concerns. Their main offices are located in close proximity to one of the explosion sites, and they might therefore be subject to evacuation (Paper V).

The crisis situation continues to develop and the scale of the event requires the activation of a large number of actors. People show up at local hospitals on a voluntary basis, not only looking for relatives, but also offering to give blood or contribute in other ways. People come together and try to help, and in the still turbulent crisis situation, there is no overarching organization of volunteers (Paper IV).

The county administrative board (CAB) in Stockholm takes on a supporting role. The mechanism they use is the procedure worked out within the scope of the Programme for cooperation – Stockholm Region. CAB initiates a *collaboration conference* for the purpose of establishing a common situational awareness, making an assessment about resources and deciding on further actions. Nonetheless, it is difficult to access accurate information because the situation is unfolding quickly, and it takes some time to gather full manpower. This regional level actor also faces a decision about whether or not to take over command of the municipal fire brigades. Since there are two major fire brigade unions with coordinated resources already in place in the Stockholm region, they decide against doing so. *Communication plans* are activated, and the national website krisinformation.se and the phone number 113 113 – which keep the public informed in cases of major crises – are used. However, public knowledge about 113 113 turns out to be limited. Despite communication plans, at this stage in the crisis, no one can escape the feeling that *information comes from all over* (Paper IV).

The attacks take place in the center of the capital, in close geographic proximity to central government buildings. They immediately receive the full attention of both the national political level and the *national response level*. MSB assumes its role of *supporting and enabling* the coordination of measures taken by local, regional and national authorities. However, uncertainties begin to develop. It seems as if other responding organizations expect MSB to assume a leading operational role and make prompt decisions about collaborative actions. However, this is not in keeping with MSB's actual mandate, unless the government acts to force MSB to lead. This confusion spurs further questions among the different organizations. In this situation, the Crisis Management Coordination Secretariat at the Government Office works to obtain an overall picture of the situation. Several organizations now call for a decisive national response. Despite this, actors in the broad response network have different understandings about, for example, how the different

levels of response relate to each other and how the various authorities are coordinated. What can the government do? (Paper IV).

Response activities continue for an extended period of time, and actors are pushed beyond their capabilities. Emergency responders work incredibly intensively for a period of time, and rail bound traffic actors around the clock to resume operations as quickly as possible. In addition, police authorities conduct extensive efforts to find the perpetrators. In a matter of hours and days, depending upon area of activity, they begin to run short of resources and manpower.

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Appendix

I. List of interviews

- **Arlanda Express**, security director and a security manager, Stockholm 5 March 2014.
- **City of Stockholm**, security director, Stockholm 18 March 2014.
- **Counter-Terrorism Co-operative Council**, coordinator at the council, Stockholm 7 March 2014.
- **Country Administration Board in Stockholm**, public manager working with crisis management, Stockholm 18 March 2014.
- **County Council Stockholm**, responsible for regional disaster medicine preparedness, Stockholm 20 March 2014.
- **Greater Gothenburg Fire Brigade**, fire fighter at the operational level, Gothenburg 11 March 2014.
- **Greater Gothenburg Fire Brigade**, director at a strategic level, Gotheburg 12 March 2014.
- **Greater Stockholm Fire Brigade**, three fire fighters working at both an operational and at a strategic level, Stockholm 16 March 2014.
- **Green Cargo**, security chief, Stockholm 3 March 2014.
- **Jernhusen**, responsible for security and crisis management preparedness, Stockholm 6 March 2014
- **MTR Stockholm**, safety director, Stockholm 18 March 2014.
- **SJ AB** –responsible for crisis management preparedness, Stockholm, 26 February 2014.
- **SOS Alarm**, responsible for crisis management, Stockholm 20 October 2014.
- **Swedish Civil Contingencies Agency**, public manager focusing on MSB's work related to the acute phase of crises, Stockholm 16 March 2014.
- **Swedish Civil Contingencies Agency** public manager focusing on MSB's work related to heightened preparedness, Stockholm 20 October 2014.
- **Swedish Police**, police with special focus on terrorism-related matters at the regional communication control center, Stockholm 4 March 2014.
- **Swedish Police, the Västra Götaland Region**, two police officers working at a strategic level and with special knowledge about cbrne-threats, Gothenburg 10 March 2014. (written answers)
- **Swedish Security Service**, officer working at a strategic level, Stockholm 7 March 2014.

- **Swedish Transport Administration**, responsible for crisis management preparedness with a special focus on antagonistic threats, Stockholm 4 March 2014.
- **Swedish Transport Agency**, chief security officer (telephone interview) 28 November 2014.

- **Ambulance services SAMUR**, Madrid 12 April 2010.
- **Fire brigades**, Madrid 12 April 2010.
- **Ministry of Interior**, Madrid 13 April 2010.

- **Ambulance services**, London 26 May 2010.
- **Fire brigades**, London 27 May 2010.
- **Health Protection Agency**, London 28 May 2010.

II. Interview guide – Swedish context

Main themes discussed

Introducing the research project

- The purpose of the research
- How the material is intended to be used

The role of the interviewee and the organization

- Position and area of responsibility
- Short background to the organization from a crisis management perspective

BEFORE THE CRISIS

Threat perception

- How the actors perceive the threat of terrorism targeting Sweden/rail bound traffic
- How threat assessments are communicated within and between different organizations
- Access to information in order to make threat assessments
- Potential changes risk awareness
- Mental preparedness for responding to terrorist-induced crises

Preparedness practices

- Actions to turn risk awareness into practical preparedness activities
- Main forums and preparedness tools to enhance preparedness for an extraordinary event
- Practices for exercises and trainings; strategies, frequency, focus, forms, participating actors
- All hazard approach vs more agent specific plans
- Economic preconditions for preparedness practices

DURING THE CRISIS (based on the scenario)

Immediate response capacity

- Main responsibilities and immediate tasks of the organization following a multiple-bomb attack targeting rail bound traffic
- Knowledge and resources of the organization to carry out their tasks
- Main challenges in terms of resources
- Prior experience of working with an extraordinary crisis

Inter-organizational collaboration

- Main collaborative partners in the immediate response to the attack
- Clarity of the own organizations' area of responsibility in time of crisis
- Roles and division of responsibilities among different actors
- Knowledge about other organizations and their tasks
- Different norms for collaboration and mechanisms to resolve potential conflicts among actors
- Management of networks during time pressure, main advantages and disadvantages
- Relationships between different levels of response, the local, regional and the national level
- The role of public-private partnerships in responding to a large-scale terrorist attack

AFTER THE CRISIS

Recovery

- Strategies to work intensively for a long period of time
- Resources and knowledge in order to "bounce back"
- Emphasis given to the concept of resilience

Learning processes

- Routines for learning
- The concept of lessons learned
- Learning from international experiences and applicability to a Swedish context

Other issues/themes

- Potential additional issues and themes brought to attention by the interviewees
- Depending on interview, some organization-specific issues were asked

III. Interview guide – International context

Main themes discussed

Introducing the research project

- The purpose of the research
- How the material is intended to be used

The role of the interviewee and the organization

- Position and area of responsibility
- Short background to the organization's involvement in the Madrid bombings or the London bombings

BEFORE THE CRISIS

- History of dealing with major crises
- History of dealing with terrorist threats and terrorist-induced crises
- Practices for exercises and trainings; strategies, frequency, focus, forms, participating actors
- All hazard approach vs more agent specific plans
- Economic preconditions for preparedness practices

DURING THE CRISIS

- Overview of critical sequences in the Madrid bombings or the London bombings
- Main consequences in terms of loss of lives, injured and infrastructure damage
- Main responsibilities and immediate tasks of the organization
- Collaboration between organizations
- Relationships between different levels of response, the local, regional and the national level
- Activation of regional and national command structures
- The role of volunteers
- The need for improvisation
- Main challenges
- Main successful elements

AFTER THE CRISIS

- Time frame for recovery from a societal perspective
- Debriefing for responding personnel
- Evaluation and lessons learned practices

- Changes in organization and culture since the events took place in 2004 and in 2005
- Participation in international research projects since the attacks
- Main lessons of value for other countries enhancing their response capacity

Other issues/themes

- Depending on interview, organization-specific issues and experiences of the events were discussed



Department of Political Science
Department of Surgical and Perioperative Sciences,
Section of Surgery
Umeå University, SE-901 87 Umeå, Sweden
www.pol.umu.se

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