This chapter studies how members of an inter-organizational team of railway coordinators collectively make sense of a potentially unexpected event and how they decide upon engaging in action. Frequently, such situations are dominated by a sense of ambiguity, and the sensemaking efforts of team members are said to be aimed at creating common understanding. Using the notion of the duality of intrinsic and constructed ambiguity, this chapter gives a detailed analysis of the collective sensemaking efforts of an inter-organizational team of railway coordinators in the OCCR. Building on observations of team meetings during the days preceding a large and potentially disruptive winter storm in December 2013, the case study illustrates how railway coordinators’ sensemaking efforts were not only aimed at reducing the ambiguity of the potential breakdown but, at the same time, they were actually increasing and constructing ambiguity. In the context of this dissertation, this chapter thus provides further evidence of: i) that breakdowns can be as much a potentiality as a one-off activity, ii) that more attention is needed for ‘real-time’ situational micro-interactions rather than the retrospective study of breakdowns as a matter of fact, and iii) that complexity, from within the territory, is managed not only by means of reducing but also by maintaining ambiguity and uncertainty in order to cope with the continuous struggle to keep an infrastructure available.

When maps are not enough: Coping with the potential breakdown
This chapter studies how members of inter-organizational teams collectively make sense of unexpected events and how they decide upon engaging in action or not. Previous studies on collective sensemaking in organizational teams have demonstrated that shared sense can be accomplished among team members with diverging orientations (Brown et al., 2008; Patriotta, 2003; Vlaar et al., 2008). While some scholars depart from an almost implicit assumption of shared sensemaking (Arnaud and Mills, 2012; Boyce, 1995), others problematize this concept (Aplan, 2008; Marshall and Rollinson, 2004). Recent literature reviews on sensemaking in organizations show that the dynamics of creating common understanding in an inter-organizational context remain unclear (Holt and Cornelissen, 2014; Maitlis and Christianson, 2014; Sandberg and Tsoukas, 2015), especially when studying how team members collectively categorize unexpected events in order to engage in collective action (Maitlis and Sonenshein, 2010; Weick et al., 2005).

During the creation of common understanding, team members of an inter-organizational team have a dual loyalty due to their commitment to both team and home organization (Cooper and Slagmulder, 2004; Pitsis et al., 2004). While the respective home organizations make sense of events in diverging and possibly contrasting ways, team members have to reach a common understanding in order to engage in collective action. Such tensions will increasingly occur as inter-organizational collaboration is a prominent feature of the contemporary networked society, characterized as complex, ambiguous and sometimes even paradoxical (Koppenjan, 2005; Smith and Lewis, 2011).

In the conceptualization of the inter-organizational team dynamics taking place when common understanding is created, ambiguity plays an important role (Abdallah et al., 2011; Jarzabkowski et al., 2010). In this chapter ambiguity is understood as situations which meaning is still vague and multi-interpretable (Abdallah and Langley, 2014; Eisenberg, 1984). In the academic debate on ambiguity two distinct analytical perspectives can be found (Sillince et al., 2012). First, ambiguity can be understood as intrinsic to situations where meanings are not spelled out yet. Second, ambiguity can be seen as constructed, resulting from the fact that different actors may give different meanings to the same phenomenon (Sillince et al., 2012). Intrinsic and constructed ambiguity forms a duality (Smith and Lewis, 2011), meaning that they complement each other. However, in specific situations, a relative dominance of one of either kind of ambiguity may be discerned (Sillince et al., 2012).

Based upon the discussion above, the central research question in this chapter is: how do members of an inter-organizational team make sense of a potentially unexpected
event, reaching a collective understanding that is either commonly shared or negotiated? To answer this question the chapter presents the temporal unfolding of collective sensemaking efforts of an inter-organizational team of railway coordinators in the OCCR about a large and potentially disruptive winter storm. This specific case was selected because the inherent tension between availability and safety in infrastructures became increasingly more explicit during the days preceding the storm. Some of the home organizations of team members valued availability over safety and vice versa, influencing how team members collectively enacted common grounds for action. As Jarzkbowski et al. (2013) notice, such an inter-organizational setting, in which a paradoxical tension between competing organizational objectives arises, is well suited to study how collective meaning is enacted over time.

This study contributes to the debate on collective sensemaking in inter-organizational teams in a twofold way. First, the findings show that whether collective sensemaking unfolds as a shared or a negotiated process depends on contextual and temporal factors that influence which kind of ambiguity is dominant. Second, the conceptualization of ambiguity as a duality explains the shifts from shared to negotiated sensemaking during breakdowns and evolving situations. This implicates that organizational actors, when confronted with an ambiguous situation, sometimes attempt to dissolve ambiguity while in other instances people enact ambiguity. In other words, the inherent complex nature of the railway infrastructure can be both an obstacle and a source to reach common understanding in deciding how to proceed forward.

The remainder of this chapter is structured as follows. I first briefly review the sensemaking literature, zooming on the different modes of collective sensemaking as either shared or negotiated. After this, I focus on the notion of ambiguity, discerning between ambiguity as constructed or intrinsic, and then relate this to the different modes of collective sensemaking. In the methodological section, this analytical scheme will be further explained in terms of how it was studied. After presenting the findings, my analysis shows how the ongoing dance between intrinsic and constructed ambiguity plays a constitutive role in the collective sensemaking efforts of this inter-organizational team. Understanding this ‘dance of ambiguity’ better helps organizational actors to cope with the potential tensions among different team members during unexpected breakdowns.
4.1 Sensemaking as enactment in an ambiguous reality

Generally, scholars understand sensemaking as the process of turning ambiguous situations into concrete and actionable categories. Sensemaking has been studied in a great variety of fields and situations, such as reorganizations (Gioia and Chittipeddi, 1991; Maitlis and Lawrence, 2003) or crisis situations (Maitlis and Sonenshein, 2010; Mills and Weatherbee, 2006). What these situations have in common is that they are characterized by some sense of vagueness: they both refer to a break with the status quo and, as such, situations do not have a clear meaning yet. A basic assumption underpinning sensemaking studies is the idea that organizational reality – besides being complex and uncertain – is predominantly ambiguous in nature (Patriotta and Brown, 2011; Weick et al., 2005). This entails that different organizational actors can understand reality differently, something which cannot be solved through rational reasoning or calculation alone (Berger and Luckmann, 1966).

Sensemaking can thus be understood as coping with, or even dissolving, ambiguous events. The notions of sensemaking and ambiguity thus seem closely connected (Hill and Levenhagen, 1995; Teelken and Watson, 2014). In the words of Weick et al. (2005, p. 419), making sense of ambiguity concerns those moments in which ‘interdependent people search for meaning, settle for plausibility, and move on’. People’s sensemaking thus deals with the enactment of a specific, rationalized image of an ambiguous reality in order to make this reality tangible and understandable (Weick, 1995). Moreover, sensemaking and acting happen in tandem, as it involves capturing circumstances explicitly and plausibly in words that serve as a springboard into action (Weick et al., 2005).

Organizational sensemaking is triggered by ‘cues’ or ‘events’ that interrupt routinized organizational practices, creating uncertainty about how to act (Maitlis and Christianson, 2014). Sensemaking can be seen as categorizing cues or events into existing categories, thereby triggering specific activities and expectations among organizational members (Housley and Fitzgerald, 2002; Whittle et al., 2015). Placing cues in existing categories is a way to simplify an uncertain world into a more comprehensible one, thereby facilitating (collective) decision-making. For instance, when an imminent or emerging event is interpreted and categorized as a specific disruption or crisis situation, organizational members can opt to switch to alternative practices and routines that fit this specific disruption or crisis, which may be quite different from everyday routine practices.
The social dynamics behind collective sensemaking are a topic of debate in which two competing mechanisms are conceptualized. The first stream of scholars holds the belief that shared sensemaking is accomplished without explicit coordination efforts, as actors are being socialized into expected sensemaking patterns by cultural and institutional contexts of organizations (e.g. Harris, 1994; Kaplan, 2008). This context consists of ‘institutional constraints, organizational premises, plans, expectations, acceptable justifications and traditions inherited from predecessors’ (Weick et al., 2005, p. 414). A common frame of reference forms the basis for ‘bracketing’ certain situational cues to make sense and take action. Teamwork is thus a catalyst for collective sensemaking based on a shared frame of reference (Arnaud and Mills, 2012; Vlaar et al., 2006, 2008). The team leader, according to this stream of scholars, can position herself as a catalyst of collective sensemaking by making sense on behalf of the team as a whole; it is thus assumed that team members automatically share the sensemaking of the leader (Morgeson and DeRue, 2006).

In contrast, the second stream of scholars views shared sensemaking in organizations itself as ambiguous rather than automatic (Bechky, 2003; Hardy et al., 2005). These authors stress that common meaning is not self-evident but, rather, that it is an accomplishment; creating collectiveness is hard work and requires much effort and interaction. In this view, organizational actors each have their own individual frames of reference, consequently leading to diverging sensemaking. This creates tensions between actors who are committed to different, sometimes competing organizations, whilst simultaneously engaging in collaboration (Das and Teng, 2000). As collectiveness needs work, several authors focus on the ways in which specific boundary objects are used to produce and facilitate a common understanding of events (Hsiao et al., 2012; Wolbers and Boersma, 2013). Especially in inter-organizational collaboration the creation of, for instance, a common picture of a situation can help to establish shared meaning to a certain workable extent. In this view, the process of ‘collective’ sensemaking seems to resemble a so-called framing contest (Kaplan, 2008; Merkus et al., 2014). Collective meaning in this perspective is based on a negotiated common ground, a necessary truce between competing actors based on diverging interpretations of reality (Koppenjan and Klijn, 2004).

In the context of inter-organizational collaboration, we can thus observe a subtle but significant shift in terms of how sensemaking and ambiguity are connected. Whereas sensemaking traditionally is conceptualized as a way to rationalize an ambiguous world into an orderly, comprehensible one, recent work (e.g. Cornelissen et al., 2014; Wolbers and
Boersma, 2013) has, at least implicitly, highlighted that the process of sensemaking itself is based on negotiations and can in itself be highly ambiguous. It thus seems appropriate to review the concept of ambiguity, keeping in mind the focus on sensemaking in inter-organizational context.

4.2 Understanding the potential breakdown through an ambiguity lens

Ambiguity is increasingly regarded as a core concept for understanding processes of organizing (Alvesson and Sveningsson, 2003; March, 2010). March (1994, p. 179) claims that, in order to make decisions and take actions, one first needs to make sense of a multi-interpretable reality:

Students of ambiguity argue that extra information may not resolve misunderstandings of the world; that the ‘real’ world may itself be a product of social construction, thus not so much discovered as invented; that interpretations of experience and desires may be fundamentally ambivalent rather than simply uncertain; and that ambiguity may be used to augment understanding through imagination.

Ambiguity is thus an inherent aspect of social reality and not necessarily something to be resolved in order to make sense and act. Based upon Eisenberg’s (1984, p. 228) notion of ‘strategic ambiguity’, others state that ambiguity not only constrains collective action but, at the same time, may also enable it (Davenport and Leitch, 2005; Denis et al., 1996; Sillince et al., 2012). For example, Alvesson (2001) shows that ambiguity in knowledge-intensive firms may open up innovative spaces for identity construction. In another example, creating an intentionally ambiguous vision is claimed to be helpful during paradoxical situations on a strategic and abstract level during which the practical consequences of the paradox are not yet tangible (Gioia et al., 2012). Similarly, Sonenshein (2010) explains the role of ambiguity for strategic change managers who intentionally tell equivocal narratives using discourses of both transformation and stability. Strategic ambiguity, then, is used to rhetorically cope with competing meanings: keeping things vague so to allow multiple interpretations to co-exist and, consequently, to enable collective action (Alderman and Ivory, 2015; Eisenberg, 2006; Jarzabkowski et al., 2010).
Following this line of reasoning, it can be concluded that ambiguity consists as an inherent property to organizational reality as well as a social construction of organizational actors. One could stress that reality is ambiguous, creating the need to make sense of an event in order to act. Or one could also claim that different actors give different meanings to the same event, thereby actually making the event ambiguous. The latter view explains the focus on collective sensemaking as a negotiated common ground. Ivory and Alderman (2015, p. 178) claim “that “ambiguity is not solely in the message”, but also arises through the interpretation of the message by recipients in different contexts’. Aply captured by Sillince et al. (2012, p. 647), ambiguity then has to be regarded as a duality: ‘it is a property of action that actors encounter as well as one that actors actively shape’. Treating ambiguity as a duality or ongoing dance helps us to understand the temporality of making sense of a disruptive event as a change process, and this relates to the broader argument of this dissertation that a focus on how organizational actors cope with complexity (in this case concerning potential situations that are still uncertain and ambiguous) is necessary to truly grasp how infrastructures are made to function.

4.3 Methodology

The chapter is based on a detailed analysis of the collective sensemaking efforts of meetings of an inter-organizational team of railway coordinators in the OCCR in the days preceding a large and potentially disruptive winter storm in December 2013. The site was selected because in the OCCR the different railway organizations were co-located, which proved valuable for studying inter-organizational collaboration. The OCCR, created in 2010, houses amongst others the main service provider NS and government-owned ProRail, the manager of the railway infrastructure. This inter-organizational center has to enable fast and good decision-making processes when disruptions occur. On a 24/7 basis and twice every shift, with each shift lasting eight hours, each railway organization sends a ‘representative’ to an inter-organizational meeting (henceforth, IOM) to inform each other and discuss operational particulars and evaluate the current shift. These representatives are called coordinators, and the IOMs are led by a National Coordinator Rail (NCR) who is an independent actor not attached to any of the individual organizations. The IOMs can be categorized according to the following three types: 1) at the start of each shift the coordinators meet to discuss the
operations for the day ahead; 2) at the end of each shift coordinators meet to evaluate and
discuss encountered issues; 3) in cases of anticipated extreme weather to make sense of the
weather reports and collectively decide which – if any – measures have to be taken in regard
to the train service of the next days.

For this study, I saw the OCCR as a boundary organization (O’Mahony and Bechky,
2008) to understand how different actors in the IOM were able to achieve mutual goals while
preserving each idiosyncratic interests. The IOMs allowed me to zoom in on the different
ways that ambiguity shaped collective sensemaking in this team. I observed and interpreted
both routine meetings (type 1 and 2 IOM) and more extreme cases involving a larger degree
of uncertainty (type 3 IOM). As others have shown before, meetings are relevant sites to
provide an in-depth analysis of how organizational events unfold temporally (Karreman and
Alvesson, 2001; Thomas et al., 2011).

4.3.1 Data Collection

Although this chapter zooms in on one particular event, the broader study of the dissertation
acted as background information for the empirical material in this chapter. I observed
around 40 IOMs, each lasting somewhere between ten to thirty minutes, and two IOM
training sessions lasting a full day. For this specific chapter I focus on the meetings in the
days preceding the storm, aiming to provide a detailed description of collective sensemaking
efforts in an inter-organizational team. This illuminates the minutiae of how this process took
place. In a sense, I chose for ‘accuracy’ at the cost of ‘generality’ (Weick, 1989), although it
has to be stressed that ‘some situations in organizations may be seen as the organization
in miniature... [and] we can learn a lot about organizational processes through the detailed
study of a specific situation’ (Karreman and Alvesson, 2001, p. 61).

Although the composition of the team of coordinators was different per shift (the
afternoon shift took over the coordinators of the morning shift, and there were also some
slight changes in the composition between the days), the functional roles remained the same.
I observed the meetings and carefully wrote down general observations as well as specific
quotes, as I was not allowed to record most of these meetings. After each meeting I wrote the
observations down into more elaborate and detailed fieldnotes. Two weeks after the storm,
there was an evaluation that was attended by some of the same coordinators. I participated
during the evaluation by sharing several observations, which we then discussed. I was allowed
to record this discussion, which was then transcribed and analyzed. Furthermore, reports about the IOMs were sent out by the NCR, summarizing and covering the most important decisions of the coordinators. An internal evaluation of the storm was written some days later, and I used this as an additional data source for the analysis and reconstruction of the collective sensemaking efforts by the team of coordinators.

4.3.2 Data Analysis

Analysis followed the grounded theory approach of travelling back and forth between the data and emerging theory (Glaser and Strauss, 2009; Locke et al., 2008). I assigned meanings (codes) to units of data, analyzed the codes for themes and emerging theoretical insights, and then returned to the data for further coding and analysis in light of these emerging theoretical insights. I triangulated the different data sources (field notes, evaluations, and other documents) to construct a chronologic narrative to understand how the event unfolded (Langley, 1999). I was able to further finalize this narrative according to the following guidelines provided by Pentland (Pentland, 1999): focal actors (who are the central actors or objects in the narrative?), voice (what are the different point of views in the narrative?), moral context (what are the cultural values and meanings that narrators attach to the story?), and other indicators (are there any other important aspects that make up the story?). I eventually ended up with a very detailed story describing the sensemaking process of the inter-organizational team in the days preceding the storm.

In order to go beyond mere description and to explain how ambiguity enabled or constrained this sensemaking process, I applied the ‘temporal bracketing’ strategy as explained by Langley (1999). The event was ‘bracketed’ into three separate episodes: (1) “Let’s manage this storm!” (2) “When is a storm a storm?” (3) “A hurricane is coming...” Each episode had to have some internal consistency and continuity, while being different from other episodes. So, these temporally bracketed episodes became the main unit of analysis, which ‘enables the explicit examination of how actions of one period lead to changes in the context that will affect action in subsequent periods’ (Langley, 1999, p. 703). Finally, I interpreted the different episodes in terms of the relevant theoretical topics (potential cues, essence of ambiguity, collective sensemaking and decisive action) to gain further insight into how collective sensemaking in the inter-organizational team unfolded.
4.4 Findings

In the IOMs, ambiguity during decision-making presented itself in several ways. Cues from the external environment were often ambiguous and therefore difficult to interpret. It was hard for coordinators to exactly determine the ‘what’ of situations on which they based their decision. In the case of anticipated extreme weather conditions, coordinators had to cope with weather reports that were inherently ambiguous, as weather is difficult to predict precisely. During one IOM, I observed that, after a detailed analysis of a weather agency, coordinators still had numerous questions to base their decision on; questions that, to frustration of the coordinators, could not (yet) be answered by the weather agency. These questions (for example: ‘What is the chance on temperature below -10°C?’ or ‘What is the chance that this weather report will change?’) were important for the coordinators’ sensemaking, as it was difficult to decide anything based on ambiguous information. One way the coordinators coped with this fact, was to use the criteria on which cues were interpreted ambiguous as well. At one point, criteria were ‘hard criteria’ on which black and white decision were made; other moments these criteria were ‘softened’ by focusing on expert judgment, creating room for alternative decisions. As one NCR reflected after a training session: ‘It’s plain guesswork. People use these criteria flexibly just to put “their own house” in order’. Although the OCCR developed a weather matrix to ease decision-making by causally relating cues, criteria and decision (i.e. if there is more than X percent chance on Y, act according to Z), coordinators allowed some room for interpretation by ambiguously interpreting the matrix, sometimes as a hard criterion and sometimes as an indication.

Moreover, coordinators felt the pressure to make the right decision on the right time. Coordinators tended to complain that they were often ‘caught by surprise’, and one NCR says after an IOM: ‘We have learned to act based on facts instead of feeling’. Making decisions based on facts at the cost of ‘gut-feeling’, sometimes resulted in the consequence that anticipated problems did not appear to the eye as a potential problem until certain thresholds were reached. Because coordinators used flexible criteria in order to cope with ambiguity they also created a sense of ambiguity; as soon as environmental cues were imminent, criteria turned into ‘hard criteria’ and potential problems into very real ones. Being caught by ‘surprise’, coordinators quickly had to make decisions.

But the ‘right’ decision in these cases was not only prone to interpretations of ambiguous weather cues in a correct way, but was also influenced by stories about previous
and similar events. Coordinators were aware of the impact of their decisions and, especially, the impact an inadequate decision would have. There were several examples of earlier years in which coordinators had decided to cut the train service in parts of the country because of anticipated extreme weather while, in retrospect, these measures were deemed inappropriate as the anticipated snowstorm turned out to be a mild breeze with just a few snowflakes scattered around the country. I observed several times how ‘the outside’ entered the IOMs, shaping the way coordinators made sense of cues. Once, for example, a coordinator raises the question ‘What will the minister think of this?’ after a doubtful decision on train cuts. Another time, a coordinator mentions that ‘we have suffered some serious reputational damage lately’ and the coordinators collectively realized that a ‘good’ decision on the ‘right’ time was even more important than ever.

4.4.1 Episode 1: ‘Let’s manage this storm!’ December 3, 13h30 until December 5 8h00

On December 3, around the clock of half past one in the afternoon, the weather agency tells the IOM coordinators that there is a possibility of a westerly gale in the Northern provinces on December 5. He tells there may be wind gusts up to 130 km/h. In the next IOM at the start of the afternoon shift, this weather report is shared with the new coordinators of that shift. In the IOM, the storm is baptized ‘the Sinterklaas-storm’, referring to an important Dutch traditional festivity that is celebrated by a large part of the population. People tend to go home early, in order to celebrate Sinterklaas in the evening with their families. The coordinators realize that this makes their decision-making especially important, as decisions about train cuts could affect the Sinterklaas festivities. At 22h00 that night, managers of the OCCR decide to officially start the decision-making procedure for the next day, meaning that on December 4 a decision has to be made by the coordinators for the following day.

The coordinators meet again at 8h00 December 4. They have to prepare an advice for their management, as they have the final say on which measures ought to be taken based on this advice. The NCR decides to use a new decision-making tree: first form a common operational picture and, based on this, define a collective decision. However, since the coordinators never used this structure so explicitly before, soon discussions arise as it is unclear whether the common operational picture concerns today or tomorrow.
The National Coordinator persists a few more times but, when he notices the dissatisfied faces of the coordinators, he gives in: “I don’t know about you guys, but this [new structure] is not making me happy at all”. They continue using their routine decision-making procedure, but throughout the rest of the meeting the coordinators mention that it is still unclear what is being discussed (observation morning meeting of December 4, 2013).

Also, the weather matrix is of little help that morning, as it does not clearly differentiate between wind gusts and wind speeds. The expected wind speed on December 5 does not seem to exceed any criteria as defined by the matrix, although this is not the case for wind gusts. The matrix, thus, does not help coordinators’ interpretation of the cues on which they can act. The potential impact of the Sinterklaas-storm is highly ambiguous and it is hard to make clear decisions based on the available information.

However, coordinators’ sensemaking does not seem hampered by this, as they soon start formulating a decision that is shared amongst all members. It is concluded that no preventive train cuts are necessary; they do advice to take some precautionary measures, such as extra availability of ‘tow-away locomotives’ and more personnel in the regional control rooms. The coordinators decide that the criteria on the weather matrix can be used flexible in this case, and are to be interpreted as follows: wind gusts are less important than wind speed, as gusts only last for a second; therefore, no measures are deemed necessary. Someone adds that, due to maintenance activities on the tracks, there will be less trains tomorrow, something which would be beneficial during a storm as the train schedule will have some more ‘air’. In fact, the coordinators decide that the motto should be: ‘Let’s manage this storm’. The NCR attempts once more to look critically at the decision, asking if nothing has been forgotten. One of the coordinators answers:

‘The coordinators of the OCCR have decided that the Sinterklaas festivities can continue as planned. That must make nice headlines in the paper!’ Everybody laughs and leaves the room to go back to their own workplace (observation IOM December 4, 2013).

In the end, nobody has a clear idea what the expected storm will be like: this feeling of ambiguity is shared among everyone involved and can therefore be understood as intrinsic to the phenomenon they try to make sense of. It is remarkable that, although the intrinsic ambiguity of the storm is high (i.e. it is still very unclear what the storm will be like), the coordinators seem resolute that their decision is the right one.
4.4.2 Episode 2: ‘When is a storm a storm?’ December 5, 8h00 – 12h00

In the morning meeting of December 5, everybody enters the room in a cheerful, energetic mood. One of the coordinators tells they have a problem with the functioning of a workstation on one of the regional posts. This may be especially problematic as this post falls within the area of where the storm is expected, so the workload for this post is already higher than usual. Another coordinator adds that there is ‘an annoying technical failure in one of the computer systems’. The ICT coordinator shrugs and tells he will have a look at it. However, the coordinators do not seem to notice these two messages as cues that may potentially have an impact on the way the storm will be managed. The meteorologist gives a weather update and the coordinators stick to the original decision of the previous day.

At 11h00 the coordinators meet again to receive an update from the meteorologist. He says that, whereas the storm was framed as ‘Code Orange’ up till that point, it has now evolved into a dramatic ‘Code Red’, the highest alert. His colleague of the weather agency takes a large map of The Netherlands and draws the exact lines of the wind forces. The meteorologist tells that the most significant difference with earlier that morning is the fact that the heaviest wind has moved further to the south: this means that some criteria will be exceeded in some train-regions. Furthermore, Schiphol Airport announces to cancel flights because of the storm. Similarly, the railway organizations of Germany and Denmark have decided to stop all train traffic in the period that the storm is expected to reach its peak. The coordinators start discussing and agree that, in retrospect and with this information, measures and cuts in the train service should have been taken. It is important here to note that the intrinsic ambiguity of the storm decreases: it becomes more and more clear what the impact of the storm will be like.

However, on the background of this imminent storm, the way that coordinators use or construct ambiguity actually increases. This pivots around the notion of the diverging goals of safety and mobility. The decision for national cuts always has to be appointed a day ahead so is out of the option for today. However, regional cuts are still possible, although there is little time left to do so. I observed the following discussion between the NCR and coordinator rolling stock and personnel about the right decision on the right time:
In the IOM of 11h00, the NCR asks quite seriously: ‘Shouldn’t we act pro-actively? Better do something now than wait for the “shit” ahead of us?’ He suggests it would be wise to lean towards the safe side and opt for cuts in train service. The coordinator rolling stock and personnel replies: ‘Let me pop that bubble for you. This cannot be prepared’. He states that regional cuts in train service (implying less mobility) make little sense, as it would be difficult to do so in a controlled way. Not just because this decision seems too late for him, but also because ‘his people’ are already busy with two other disruptions that happened earlier that morning, and it would be difficult for them to cope with additional measures in the train schedule. Another coordinator states that doing nothing at this point does not feel like being in control, something that is ignored by the previous coordinator who persists: ‘We don’t have a solid plan and we’re not going to make any cuts purely decoratively’ (observations IOM December 5, 2013, 11h00).

Although the storm becomes more like a real storm (i.e. it becomes less and less ambiguous), the coordinators only now start discussing possible options. We can interpret this as an increase in constructed ambiguity; the coordinators use certain expressions to strategically protect each individual goal or persuade others into a particular direction. One coordinator wants to choose for service cuts in order to be on the safe side, by suggesting that the storm will cause a lot of upheaval (‘the “shit” ahead of us’). Another suggests that doing so will only cause more problems as the cuts are impossible to prepare in orderly fashion at this late stage (‘Let me pop that bubble for you’ and ‘We don’t have a solid plan’); he strategically puts the goal of mobility on a more important level than safety, as service cuts would be an impossible goal to attain now anyways. Discussions are no longer focused on the ambiguity of the storm; the ambiguity now concerns the ‘storm as disruption’. The storm is no longer ambiguous, but whether it should be regarded as a disruption that needs to be acted upon is now ambiguous. Between the lines, the coordinators question whether this unplanned disruption is more important than the planned maintenance already hampering mobility. The coordinators do seem to feel that this constructed ambiguity constrains the collective sensemaking efforts and decision-making as, in fact, the conclusion of the meeting is to do nothing while the storm is approaching:

At the end of the meeting, there is a long and awkward silence. One coordinator breaks the silence, mumbling: ‘It feels like we’re going to get wet guys. It sounds as if we’re going to drown slowly today’. His remark echoes through the room for just a second, after which some of the coordinators nervously start moving on their chairs. One of the coordinators mentions he wants go back to work, after which all the coordinators stand up, leave the room and go back to their computer screens (observation IOM, December 5, 2013, 11h00).
4.4.3 Episode 3: ‘A hurricane is coming...’ December 5, 12h00-14h00

At 12h00, everybody enters the meeting room, while the NCR and meteorologist are already in discussion. The NCR whispers: ‘That’s a very unpopular measure. But it is important, so it should be said. Expect some resistance but tell them loud and clear’. A coordinator senses the tension in the room and grabs a sign that reads ‘Do not enter’ (mostly used during calamities and people in the OCCR do not want to be disturbed): ‘I guess I better put this in front of the door already?’ he asks. When everybody has taken seat, the meteorologist starts with a serious tone: ‘the situation has changed’. He explains that it seems the wind will have hurricane-like proportions in the Northern provinces, and that there will be extra high risks of trees falling on the overhead wires or, worse, on trains. His advice is to cancel all train traffic in the Northern provinces from 14h00 until 16h00. In terms of ambiguity, the intrinsic ambiguity is close to zero as from this moment on it is no secret what the storm will be like: it is right at the doorstep and framed as one with hurricane-force.

Although the coordinators seem surprised that the storm has evolved into such a severe one, they quickly agree to follow the advice of the meteorologist. The coordinator, who in the previous meeting was against taking any measures, says: ‘This is a very clear signal. Let’s use the rest of our time to decide where we should stop the trains’. The coordinators have to decide about the exact area in which the railway service shall be suspended. With the help of the weather map, the coordinators decide to advice management and directors to stop all rail traffic in the area north of the line Amsterdam – Zwolle after 14h00. The NCR asks if it is still possible to provide some sort of shuttle service safely, but the Information coordinator interrupts: ‘Safety first! If it is not safe for trains it is also unsafe for shuttles’. Someone else adds: ‘Safety. Perhaps we should frame it in that perspective’ upon which another coordinator mentions: ‘They [the public] have to understand it that way, don’t they?’

Although the weather has not changed significantly in the last hour, it is the meteorologist’s claim that the storm is like a hurricane that makes it impossible for the coordinators to ‘play’ with some form of constructed ambiguity; the intrinsic ambiguity of the storm is so low (thus the impending hurricane so evident) that it would be difficult to legitimize any other decision than stopping the train service. In fact, the different goals of safety and mobility are not a problem anymore. One coordinator clearly states ‘Safety first’ and all the coordinators agree. The meteorologist, almost acting as a ‘deus ex machina’, eases and influences coordinators’ sensemaking efforts, which allows them to collectively decide on measures that have a serious impact on the train service.
4.5 Discussion

The findings show that when intrinsic ambiguity is high or very low, collective sensemaking seems to be commonly shared and almost automatic (see table 5 for an overview). At the start, cues about the Sinterklaas-storm are very ambiguous – intrinsic ambiguity is high – and all team members agree that escalating the status quo is not necessary since both safety and mobility is valued equal by all members. At last, when there is nothing inherently ambiguous about the storm suddenly consensus comes into being of valuing safety over mobility. At a certain point in time, as it becomes clear that the storm actually turns out to be a hurricane, the intrinsic ambiguity is in fact very low: everyone has the same image about the threat posed by the storm and the potential disruption caused by it. When the nature of ambiguity is mainly intrinsic – i.e. when the meaning of a phenomenon is still so vague that no one really grasps it – sensemaking seems to be collective.

This study shows that in-between maximal and minimal intrinsic ambiguity, collective sensemaking can be conceptualized as a negotiation of meaning: ambiguity becomes more and more constructed, based on the diverging interpretations of actors. This was the case when the cues about the storm became more pronounced and intrinsic ambiguity decreased – it became clear that a storm was coming. Preventive measures are regarded as a disruption of mobility and those actors who value mobility are only prone to opt for preventive measures if this seems absolutely necessary. Even though the fact that a heavy storm is approaching becomes undeniable, the idea that this storm will be a threat to the railway system becomes ambiguous instead: actors make increasingly diverging sense of the imminent storm and negotiations about the necessity of escalation and decisive action become tenser. In other words, when the cues concerning the impending storm become less and less ambiguous, the actors in the team make sure that the storm remains ambiguous as ‘potential disruption’ because of their diverging interpretations. When a truce between diverging (paradoxical) objectives – such as mobility and safety – becomes increasingly tense, collective sensemaking can be regarded as a struggle for meaning: instead of being grounded in commonly shared perceptions, collective sensemaking becomes based on negotiated compromises. A stable truce or a sudden tilting of the balance in favor of one specific objective leads to common sense, whereas the gradual disturbance of a truce due to rising tension between diverging perspectives leads to negotiated sense.
<table>
<thead>
<tr>
<th>Episode</th>
<th>“Let’s manage this storm!”</th>
<th>“When is a storm a storm?”</th>
<th>“A hurricane is coming…”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potential cues</td>
<td>• Weather agency report</td>
<td>• Technical malfunctions in systems</td>
<td>• Storm evolves into one with hurricane-like proportions</td>
</tr>
<tr>
<td></td>
<td>• Confusion about wind gusts and speed</td>
<td>• Similar organizations shut down service</td>
<td>• Weather agency reports it is ‘unsafe’ to continue train service</td>
</tr>
<tr>
<td>Type of ambiguity</td>
<td>High intrinsic ambiguity, low constructed ambiguity</td>
<td>Decreasing intrinsic ambiguity, increasing constructed ambiguity</td>
<td>Low intrinsic ambiguity, low constructed ambiguity</td>
</tr>
<tr>
<td>Type of collective sensemaking</td>
<td>Shared and consensual sensemaking</td>
<td>Dissensus/struggle, and negotiated sensemaking</td>
<td>Sudden shared and consensual sensemaking</td>
</tr>
<tr>
<td>Decisive action</td>
<td>• No upscaling</td>
<td>• Consideration of potential preventive measures but no action</td>
<td>• Train service is shut down in the North of the country</td>
</tr>
</tbody>
</table>

| Table 5. Temporal development of ambiguity and collective sensemaking |

The imminent unexpected event of a storm created an urge for collective sensemaking while the inter-organizational context increased the presence of diverging interpretative frames. This study demonstrates that the inter-organizational team is keeping the balance that enables both safety and mobility to be pursued, with the aim to avoid disruptive preventive measures. ‘Keeping things ambiguous’ – increasing constructed ambiguity when intrinsic ambiguity decreases – was used as a coping mechanism for making collective sense, even when this led to the decision to take no extra precautions. The process of collective sensemaking is made possible through the social construction of ambiguity: this allows negotiation among different actors who still give contrasting meaning to a situation that in itself seems to become more and more obvious. In the context of inter-organizational collaboration, diverging understandings and interests, growing tension and potential risks,
the prolongation of ambiguity can sustain collective sensemaking – even if this entails refraining from action and maintaining the status quo.

I demonstrated that the mode of collective sensemaking is context-dependent and temporal: different situations trigger different modes of collective sensemaking. The mode of collective sensemaking can thus shift between shared and negotiated when potentially unexpected events create tensions between actors with diverging interpretations. In sum, a nuanced conceptualization of ambiguity in sensemaking studies leads to a more dynamic understanding of collective sensemaking. This finding is not only interesting for the extensive literature on sensemaking but also for researchers focused on collaboration in teams (Ashmos and Nathan, 2002; Morgeson et al., 2010), for it would entail that for instance the role of team leaders as prime sensemaker might not be automatically assumed. Creating inter-organizational teams is not automatically an instrument for fostering successful inter-organizational collaboration.

Future studies on collective sensemaking in an inter-organizational context can focus on recognizing situations in which ambiguity is enacted because of diverging understandings. The motivations of team members could be studied: do they strategically manipulate ambiguity in order to enact the most proficient trade-off between contrasting ambitions (Abdallah and Langley, 2014) or do they hide behind ambiguity because they are unable to negotiate common ground? Are decision-makers attempting to make the most elegant and balanced decision or are they too afraid to make any decision while instead stalling sensemaking until only one possible course of action is left? This tension is also visible within this chapter, although I have not focused on answering it here. Since inter-organizational collaboration is an increasingly prominent feature of contemporary networked society, a better understanding of the tension between making proficient trade-offs or escalated indecision is a valuable research objective.

4.6 Conclusions

The core research question of this chapter focuses on the ways in which an inter-organizational team collectively makes sense of an unexpected disruptive event in a complex organizational field. The findings do not offer the ultimate solution for the debate in the literature whether this collective sensemaking is commonly shared or negotiated. Instead, I have shown that
conceptualizations of opposing groups of scholars are both valid statements: team work can be a catalyst for collective sensemaking (Arnaud and Mills, 2012; Vlaar et al., 2006) just as well as the balancing act of being committed towards both home organization and inter-organizational team can lead to negotiated collectiveness (Cooper and Slagmulder, 2004). The findings show that the context – and in specific the kind of ambiguity in that context – influences which route toward collective sensemaking is taken.

The way in which team members make sense of emerging events implicitly shapes how the railway infrastructure functions. This chapter has shown that coping with the complexity of potential breakdowns involves playing with ambiguity. The ways in which coordinators dealt with the complexity of the infrastructure is rather different than how this supposed to happen, for instance when comparing to how sensemaking is implicitly inscribed in the decision-making tree or weather matrix. Thus, in practice – or in the territory, one could say – coping with complexity looks like making pragmatic choices to keep the inherently paradoxical nature of infrastructures as long as this is viable and safe to do so intact. Rather than dissolving these paradoxes or reducing the complexity of situations, this chapter has shown that ambiguity is a way through which coordinators are able to maintain both paradox and complexity in order to keep the trains on the right track.