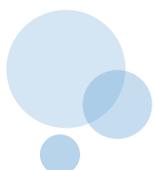


## Multi-level Alignment of Regional Approaches to Critical Infrastructure Resilience by Learning from Experience

Deliverable 3.4.1: Final Recommendations to enhance and strengthen Public-Private collaboration at regional, national and EU levels to address CIP issues

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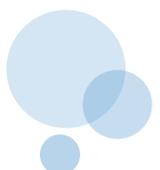


## Table of Contents

Executive Summary .....	4
1. The Research Process .....	6
1.1. Aim and Scope of the activity (WP3).....	6
1.2. Study Methodology.....	8
1.3. Summary of Recommendations .....	8
2. Regional Level PPP Collaboration .....	13
2.1. Developing the Concept of ‘Resilient Communities’.....	13
2.2. Improving Preparedness and Emergency Management Arrangements within the Critical Infrastructure.....	13
2.3. Developing Resilience Building to apply to more than simply the Emergency Phase of a Crisis.....	14
2.4. Increasing the Efficiency of Existing CIR Processes.....	14
3. National Level PPP Collaboration.....	16
3.1. Developing an Information Sharing Process which can be adopted across multiple Public-Private Collaborative Arrangements .....	16
3.2. Building a Shared Vision of what needs to be done to address Critical Infrastructure Disruptions .....	17
3.3. Identifying cases of Best Practice in relation to Resilient Institutions and promoting them to Peer Organisations.....	17
3.4. Developing a Process to Communicate between Authorities and Critical Infrastructure Operators on Risk and Resilience Issues .....	18
4. EU Level PPP Collaboration.....	18
4.1. Developing greater and more coherent Intra-State standardisation regarding CIR Strategy, and Legal/Procedural issues.....	18
4.2. Development of Wider Collaborative Research and Sharing of Good Practice amongst EU Member States .....	19
4.3. Developing from Protection to Resilience.....	19
4.4. Developing a Common Understanding of the ‘Resilience’ Concept .....	20
4.5. Developing a more Co-ordinated Collaboration Process between CI Operators and Emergency Management Authorities.....	20
5. Miscellaneous Recommendations.....	22
5.1. Development of Intra-State clarification and harmonization of rules, procedures, legislation and compliance frameworks to assist operators and authorities .....	22
5.2. Engagement with Non-Miracle Partner Countries .....	22



5.3. Engagement process for future research.....	23
5.4. The Development of Public-Private Partnerships.....	23
5.5. Co-operation between Partners.....	23
5.6. Developing coordination when addressing CIR issues.....	24
5.7. Development of a PPP Model to Enhance Resilience and Collaboration.....	24
5.8. Understanding Risk Governance .....	25
5.9. Using a PPP Process to Protect Critical Infrastructure from Attack .....	25
6. Conclusions.....	26
7. References.....	27



## Executive Summary

Miracle is an ambitious project, that aims at supporting regional Critical Infrastructure Protection and/or Resilience (CIP/R) strategies, in order to improve existing capacities of the EU Member States to prevent, prepare and protect people against security related risks, including terrorist attacks.

Specific objectives of Miracle are:

- To increase awareness and knowledge on regional CIP/R strategies with focus on issues, that are also of interest at national or EU levels
- To stimulate, promote and support the exchange of regional CIP/R experiences, in order to establish best practices and related guidelines, with the view to enhance and develop existing capacities at regional level
- To develop and promote a multilevel framework to align regional strategies with national or EU policies, in order to increase the efficiency and coherency of existing and future CI strategies.
- Critical Infrastructure Resilience Stakeholder Collaboration

To protect national infrastructure, many public safety and other governmental agencies are establishing partnerships with private-sector organizations to assist in planning, resource allocation, communication strategy, and coordinated response to and strategic recovery following all types of hazards. Regional programmes to Critical Infrastructure Resilience aim to increase capacity to prevent, protect against, respond to, and recover from major incidents.

In this report Public-Private Partnership (PPP) is understood as being “CIR Stakeholder Collaboration”, i.e.

***“PPP is the collaboration of stakeholders, e.g. government, public or private CI operators, responders, and communities, in order to raise the resilience of essential services that our communities rely on.”***

In this definition, we define Critical Infrastructure Resilience as the way:

- To guarantee the functional continuity of the services provided by urban infrastructures in time of stress and disaster;
- To limit the extent of losses and impacts in the urban area if a disaster strikes;
- To ensure fast recovery if the infrastructure is severely damaged;

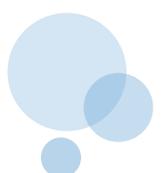
PPP modes range from big cities, counties/provinces, regions, states/nations all the way to international. In the MIRACLE Project ‘regional’ is understood as the administrative scale but also as the coherent territory corresponding to a CI system extension. The main assumption behind the Miracle project is that, if regional CIP/R strategies are supported, this will allow addressing Critical Infrastructure Protection issues that national and EU policies would have difficulties to address, while it will contribute to enhance the overall resilience and security levels of the EU Territory.





The present deliverable aims to identify and map the existing needs and requirements of the stakeholders involved in regional CIR strategies with respect to public-private collaboration practices, and provide recommendation to take this work forward.

The main audience for this deliverable will be the European Commission itself.



## 1. The Research Process

### 1.1. Aim and Scope of the activity (WP3)

The general objective of the MIRACLE Working Package 3 (WP3) is to strengthen Public-Private collaboration in the European Union in order to address Critical Infrastructure disruption issues, through learning from existing regional Critical Infrastructure Resilience strategies.

This deliverable aims to elaborate the final output of WP3 and present a set of recommendations to enhance and strengthen the Public-Private Collaboration at Regional, National and EU levels to address CIP/R issues.

The objective is to take stock of the experience of existing regional CIP/R practices with regard to Public-Private collaboration schemes and to identify what could be of interest also at national and EU levels

The recommendations will also seek to address the existing gaps and propose priority areas for which further action should be taken. The Scottish Government will elaborate the recommendation in collaboration with RGS. The other MIRACLE partners will review and amend them if necessary.

The desired outcome would be to strengthen and support better collaboration between Public and Private stakeholders in the EU, based on the added value provided by regional strategies.

This task is mostly based on:

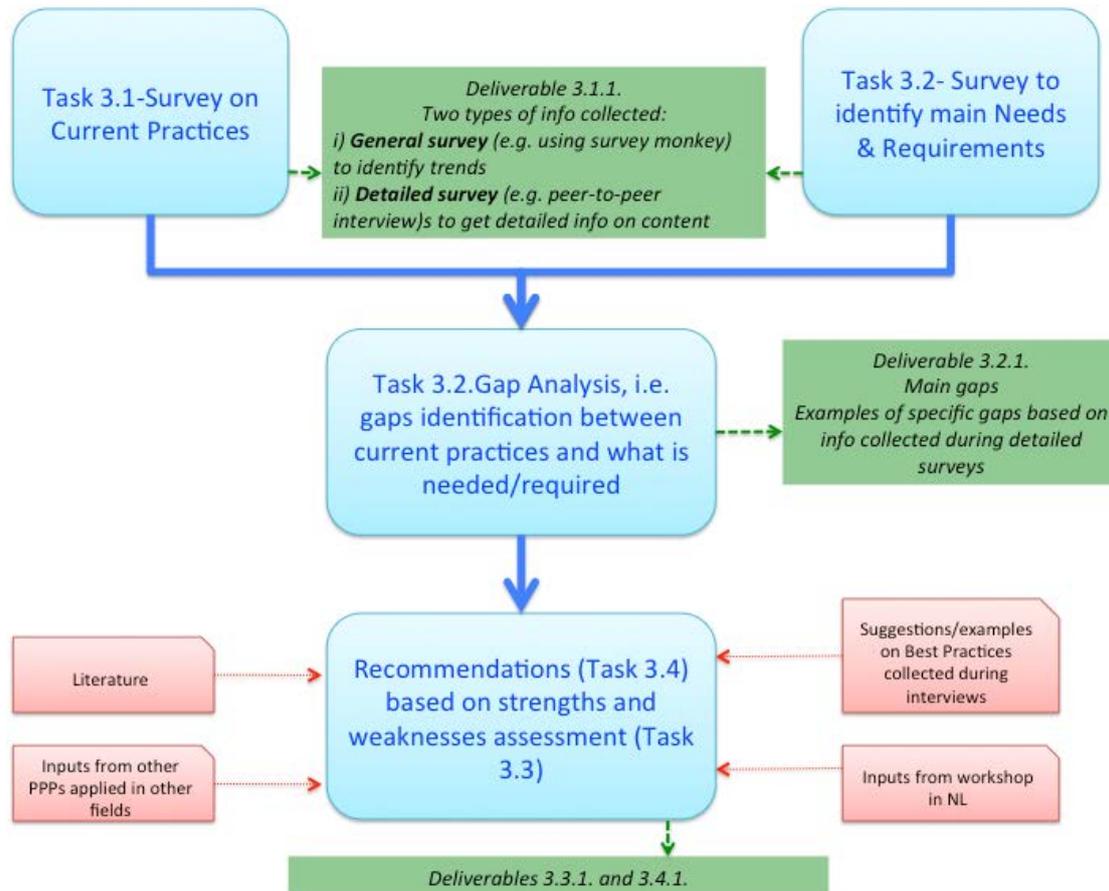
- Analysis of the inputs provided by tasks 3.1, 3.2 and 3.3.
- Contribution from all partners of the consortium will be required to assist in the identification of Recommendations based on their own experience.

The output of this task will be the final report providing recommendations on how to enhance and strengthen Public-Private collaboration at regional, national and EU levels, to address CIP issues.

**It should be emphasised that the background to all of the recommendations contained in this Deliverable can be found in the preceding Deliverables 3.1.1; 3.2.1; and 3.3.1, and this document should in fact be read in conjunction with them.**



The workflows within WP3 can be presented as follows:



**Figure 1 – Workflows within the MIRACLE Working Package 3**

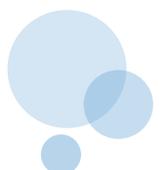
This deliverable reports the main findings of task 3.4 namely –

**“Final Recommendations to enhance and strengthen Public-Private collaboration at regional, national and EU levels to address CIP issues”.**

As stated earlier, the document will seek to review and analyse data obtained from:

- Task 3.1 – Report on the survey and review of current Public-Private collaboration schemes
- Task 3.2 – Report on Gap Analysis and review of Stakeholders’ needs and requirements of WP3 and from this develop recommendations on progressing this work.
- Task 3.3 – Final Report on Assessment of Strengths and Weaknesses of existing Public and Private Collaboration Schemes

The above three deliverables will provide in-depth research on the issues being reviewed and they have been included as appendices to this report. This deliverable will focus on



Recommendations to enhance and develop PPP collaboration at Regional, National and EU levels to address CIP issues.

Target groups of the review were both local and regional authorities which have implemented a regional CIR strategy, and Critical Infrastructure operators involved in collaboration schemes to address security and resilience issues.

## 1.2. Study Methodology

WP3 undertook to identify practices and processes employed in subject countries relating to Public-Private Collaboration schemes and critical infrastructure resilience, through the surveying of key respondents and the analysis of their responses.

The respondent survey was based on (1) an online questionnaire, (2) Focus groups and (3) interviews. A number of strengths and weaknesses were identified through the adoption of this approach and these will be outlined in more detailed in this section.

Just over 300 requests were circulated to complete the on-line questionnaires, however only 158 completed questionnaires were returned, and of these only 136 were usable.

Two *focus groups* were organised in The Netherlands and in Lombardy (Italy), gathering a group of 10-15 invited stakeholders each. The focus groups were run following the format of a structured debrief, using three questions about Critical Infrastructure Resilience (CIR): Q1 – What does not work well in your current approach to CIR? Q2 – What does work well in your current approach to CIR? Q3 – If you could start again what would you do differently?

A set of one to one interviews were carried out among selected representatives of Dutch, Italian and British stakeholders involved in CIR programs. The structure of the interview was similar to the questionnaire.

In this deliverable, recommendations have been developed from the responses provided by survey participants. These will identify options to take forward the process of Public-Private Collaboration at regional, national and EU levels in order to address CIP/R issues

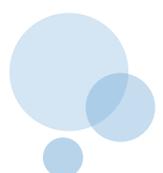
The Recommendations will be broken down into four sections i.e.

- **Regional Level PP Collaboration Recommendations**
- **National Level PP Collaboration Recommendations**
- **EU Level PP Collaboration Recommendations**
- **Recommendations which apply across all Levels**

## 1.3. Summary of Recommendations

### **Recommendation 1:**

*It is recommended that CIRINT.NET be used as a communications tool in ensuring focus on, and development of, the topic of community resilience to assure a common perspective and adoption of good practice.*



**Recommendation 2:**

*It is recommended that CI operators (both public and private) be encouraged to improve preparedness and emergency management arrangements within the critical infrastructure. This could be achieved through the greater sharing of information and best practices and the use of the CIRINT.NET would be key to this dissemination.*

**Recommendation 3:**

*It is recommended that greater focus be placed on resilience during the monitoring, prevention and recovery phases of incidents, as these are less well addressed than the emergency management phase. The CIRINT.NET should be used to raise awareness of this issue.*

**Recommendation 4:**

*It is recommended that CIRINT.NET stakeholder groups should explore how multi-level approaches to CIR can be implemented. This may vary between regions, and so sharing of examples at regional level can help regional stakeholders determine good practices for adoption.*

**Recommendation 5:**

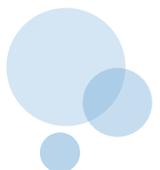
*It is recommended that information sharing processes be developed across multiple Public-Private collaborative arrangements in relation to CIR, including the creation of formal Information Sharing Protocols, and introduction of appropriate security measures to protect any information being shared. Information Sharing good practice examples provided by Miracle should be widely disseminated via CIRINT.NET and this should act as a foundation for the progression of an International Critical Infrastructure Resilience Network.*

**Recommendation 6:**

*It is recommended that the concept of a shared vision be developed for stakeholder groups (both public authorities and private operators) regarding what requires to be done in the event of Critical Infrastructure disruptions. The CIRINT.NET network should be used to place greater emphasis on not only exposing good practice through case presentations, but also by getting stakeholders to communicate and share good practice and a common vision in a trusted environment.*

**Recommendation 7:**

*It is recommended that cases of best practice in relation to resilient infrastructure or institutions be identified and promoted within peer groups or communities, to allow the dissemination of best practice. A database of examples of resilient organisations should also be developed via the CIRINT.NET network.*



**Recommendation 8:**

*It is recommended that common language/processes are developed to allow more effective communication between authorities, CI operators and other stakeholders in relation to risk and resilience, and that CIRINT.NET be used as a means of progressing this issue.*

**Recommendation 9:**

*It is recommended that consideration be given to developing a standardised multi-level resilience framework within the EU and its member states, taking into account legislation and rules implemented by operators. The CIRINT.NET network should be used to ensure that a wider discussion of frameworks takes place amongst partners, including both regulatory and self-regulating approaches, in order to expose good practices for wider consideration of harmonisation opportunities.*

**Recommendation 10:**

*It is recommended that the support of the EU CIP's be developed to encourage future collaborative research opportunities and the sharing of good practice. The CIRINT.NET network should be used as a communications channel between the CIP's and Member States security stakeholders.*

**Recommendation 11:**

*It is recommended that CIRINT.NET be used to emphasise the strength of aligning both protection and resilience approaches within CI organisations, and to invite the exchange of experience between members to further illustrate the benefits and operational aspects of such an approach.*

**Recommendation 12:**

*It is recommended that an agreed common terminology be developed relating to the concept of 'Resilience'. This should apply across all stakeholder groups and across all levels (Government, Industry (Private and Public), Responder Organisations and Communities). CIRINT.NET should be used as a key means of exchanging perspectives in this area between stakeholders in Europe.*

**Recommendation 13:**

*It is recommended that collaboration programmes among the various operators and emergency management authorities be developed due to differing systems' interdependencies and the complexity of the risks that individual organizations cannot address on their own, and that future work of the CIRINT.NET supports the spread of good practice by sharing information on how successful partnerships have created a collaborative model that develops information sharing, and enhances organisational knowledge of interdependencies.*



**Recommendation 14:**

*It is recommended that consideration be given to the harmonisation and standardisation of existing rules, procedures, legislation and compliance frameworks between EU states, to simplify the work of operators and different government departments. It is further recommended that a coherent approach be developed between national, regional, and local strategies to enhance co-operation and coordination between CIR stakeholders to identify redundancies or major gaps in strategies. The CIRINT.NET network should be a key tool in developing this harmonisation process.*

**Recommendation 15:**

*It is recommended that further research be undertaken with non-Miracle partner countries through CIRINT.NET as a key dissemination vehicle to engage with non-partner countries and broaden geographical coverage.*

**Recommendation 16:**

*It is recommended that future research into the issue of critical infrastructure resilience should focus on engagement with the private sector to allow a balanced consultation process between sectors, and as the CIRINT.NET network aims to represent partnerships around critical infrastructure of all kinds, the future work of CIRINT should focus on developing partnerships within existing critical infrastructure which will involve both private operators and public authorities.*

**Recommendation 17:**

*It is recommended that CIRINT.NET be used to support the development of Public-Private Partnerships by supporting the exchange of good practice both in terms of how formalisations benefit partnership working, and how the actual collaborative processes work in practice.*

**Recommendation 18:**

*It is recommended that further research should be carried out, including through the use of CIRINT.NET, into strategies whereby regional stakeholders can safely identify road-blocks that limit partner collaboration.*

**Recommendation 19:**

*It is recommended that through CIRINT.NET, greater co-ordination is encouraged between organisations when addressing CIR related issues, to ensure focus on the practical solutions to organising roles and responsibilities.*

**Recommendation 20:**

*It is recommended that the PPP model using a 5 self-examination stage process should be used as a focus for CIRINT.NET work to provide a common approach to enhancing resilience and collaboration.*

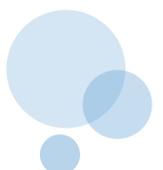


**Recommendation 21:**

*It is recommended that the CIRINT.NET be used to assist in the improvement of multiple stakeholder involvement from different sectors in risk governance processes. This should be achieved by examining good practice in this area, and allowing open exchange between stakeholders.*

**Recommendation 22:**

*It is recommended that CIRINT.NET be used to promote the UNICRI – 10 Guiding Principles of CI protection and comparable approaches, so that its growing community can test and exchange experience to ensure wider EU appreciation of best practice/approaches.*



## 2. Regional Level PPP Collaboration

### 2.1. Developing the Concept of ‘Resilient Communities’

Not all disruptive events can be prevented and the focus should be on supporting the system or society to get ready to face unexpected crises. In the field of Critical Infrastructure (CI) analysis, disaster resilience refers to “the capability to prevent or protect against significant multi-hazard threats and incidents, including terrorist attacks, and to expeditiously recover and reconstitute critical services with minimum damage to public safety and health, the economy, and national security” (TISP, 2006).

On the basis of this definition, resilience becomes a matter for the whole community and not only of the Public Authorities and operators. This is why one of the fundamental pillars to enhance resilience is played by the implementation of collaboration schemes among the stakeholders who could potentially be involved in Critical Infrastructure disruptions.

Resilience is not the sole responsibility of the CI asset owner, it is also essential to have resilient communities (both sector and social). Meaningful and positive engagement with local communities can provide true community resilience in responding to a crisis or emergency. The use of the CIRINT.NET network will greatly assist in developing this engagement. However, while a community resilience model has been developed in certain countries, it still requires to be successfully applied across others.

#### **Recommendation 1:**

**It is recommended that CIRINT.NET be used as a communications tool in ensuring focus on, and development of, the topic of community resilience to assure a common perspective and adoption of good practice.**

### 2.2. Improving Preparedness and Emergency Management Arrangements within the Critical Infrastructure

The main objective for both public and private respondents is to improve preparedness and emergency management arrangements. This result does not contradict the fact that for private CI operators, economic interests are paramount, whilst the public sector consider safety as paramount. In both cases, improving emergency management allows one to reduce the impact on the population, and to go back to business as quick as possible. This objective is closely followed by the need to improve planning and prevention, to enhance resilience and to improve the assessment of criticalities and risks, as well as protecting the security of citizens.

As a consequence the main priorities for the public sector respondents to the survey were “scenarios and impact assessments”, “Emergency Plans and Joint Response Plans”, and the “identification and exchange of best practices”. For the private respondents, a “Joint response plan”, the “identification and exchange of best practices”, “communication



protocols” and the “development of models of interdependent critical networks” are the most important results achieved. From an operators’ standpoint, the CIR collaboration results in safer infrastructures, less accidents, and a better response when an accident occurs.

#### **Recommendation 2:**

**It is recommended that CI operators (both public and private) be encouraged to improve preparedness and emergency management arrangements within the critical infrastructure. This could be achieved through the greater sharing of information and best practices and the use of the CIRINT.NET would be key to this dissemination.**

### **2.3. Developing Resilience Building to apply to more than simply the Emergency Phase of a Crisis**

While resilience is seen as being relevant to all stages of a disaster, the survey shows that resilience is often mainly focused on the emergency management phase followed by the prevention and mitigation phases. This is mainly due to the fact that resilience issues have initially been addressed by risk and security managers in charge of crisis management.

For instance there is a high level of coordination during the emergency management phase of an incident while cooperation may be low during the monitoring and prevention phases. As a consequence some phases, in particular the recovery phase are less well addressed.

The questionnaire shows that the stakeholders expect results not only related to improving existing emergency management practices, but also to improving the knowledge and understanding of vulnerabilities, as well as improving prevention, protection, planning and preparedness and the response and recovery arrangements.

#### **Recommendation 3:**

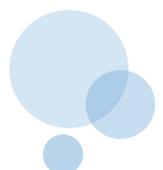
**It is recommended that greater focus be placed on resilience during the monitoring, prevention and recovery phases of incidents, as these are less well addressed than the emergency management phase. The CIRINT.NET should be used to raise awareness of this issue.**

### **2.4. Increasing the Efficiency of Existing CIR Processes**

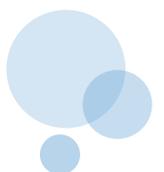
The survey respondents stated that the will to address CIR issues is stronger nowadays and addressed by different institutions or operators. However, this results in a multiplication of initiatives (e.g. multiplication of working groups, plans etc.) which proves to be less efficient, than a coordinated and comprehensive approach.

#### **Recommendation 4:**

**It is recommended that CIRINT.NET stakeholder groups should explore how multi-level approaches to CIR can be implemented. This may vary between re-**



**gions, and so sharing of examples at regional level can help regional stakeholders determine good practices for adoption.**



### 3. National Level PPP Collaboration

#### 3.1. Developing an Information Sharing Process which can be adopted across multiple Public-Private Collaborative Arrangements

There is currently a lack of information sharing across many Public-Private collaborative arrangements. This means that each stakeholder has only a partial understanding of the CIR issues. This in turn triggers a fragmented view on system problems (like transport). Because of the lack of information sharing, operators still have difficulty understanding how their process is influencing others processes.

Similarly, in the case of an emergency, the emergency managers lack a comprehensive common operational picture. There is thus a need to encourage the stakeholders (in particular private operators) to share information. There are already some rules asking CI operators to provide information in case of emergencies, but the interpretation still differs from one operator to another.

Information sharing raises commercial and sensitive issues, in particular for private partners but also for the public sector (for example the health sector where there are confidentiality issues). When undertaking information sharing, difficulties may occur regarding the interpretation of the information. In addition, information coming from different sources may be difficult to interpret because of the current limited common standards in use for information sharing.

At present, no mature network exists to disseminate potential benefits for members, including: Clear Guidelines; Webinar Training Products; Recommendations to Strengthen Collaboration; and Good Practice examples.

There is an identified need to develop a common language to communicate among authorities and Critical Infrastructure operators (e.g. common and harmonised emergency thresholds). In addition it is essential that partners/stakeholders develop an agreement on the type of information to be communicated to the different stakeholders for each phase of a crisis or disruption.

An inhibitor to the sharing of information between CIR stakeholders has been the potential for sensitive information to be inappropriately shared or other stakeholders failing to secure information appropriately. Many of the problems identified can be overcome by the development of an appropriate Information Sharing Protocol. A highly important factor in facilitating information sharing is the development of trust between partners.

#### **Recommendation 5:**

**It is recommended that information sharing processes be developed across multiple Public-Private collaborative arrangements in relation to CIR, including the creation of formal Information Sharing Protocols, and introduction of appropriate security measures to protect any information being shared. Information Sharing good practice examples provided by Miracle should be**



**widely disseminated via CIRINT.NET and this should act as a foundation for the progression of an International Critical Infrastructure Resilience Network**

### **3.2. Building a Shared Vision of what needs to be done to address Critical Infrastructure Disruptions**

In the field of CI strategies, the main challenge raised by governance is related to the need to involve very different types of stakeholders: public authorities, authorities from different jurisdictions, private operators, operators from different sectors, the media, the population, etc. Each group of stakeholders has its own interests, hence a different understanding of what achieving resilience means.

Potential conflicts may arise, for instance when business interests are not compatible with public security. It is thus essential to organize and moderate negotiations between different stakeholders. The main challenge here is to build a shared vision of what needs to be done to address CI disruptions, while defining the boundaries of “win-win” situations, and to set up adequate collaboration schemes, such as Public-Private Partnerships.

Such PPP are already operational for instance in Scotland, where the regional Critical Infrastructure Strategy “Secure and Resilient” is based on a Critical Infrastructure Partnership Framework between Government and those responsible for the critical assets, with the aim “to minimize disruption to any part of that infrastructure or to any of our communities living and working across Scotland” (The Scottish Government, 2011).

#### **Recommendation 6:**

**It is recommended that the concept of a shared vision be developed for stakeholder groups (both public authorities and private operators) regarding what requires to be done in the event of Critical Infrastructure disruptions. The CIRINT.NET network should be used to place greater emphasis on not only exposing good practice through case presentations, but also by getting stakeholders to communicate and share good practice and a common vision in a trusted environment.**

### **3.3. Identifying cases of Best Practice in relation to Resilient Institutions and promoting them to Peer Organisations**

While there may be a differing understanding of what resilient institutions actually look like, there are examples available where the institution or asset provides examples of best practice. However, many of these examples are not widely known of due to poor communication systems to promote them further afield.

#### **Recommendation 7:**

**It is recommended that cases of best practice in relation to resilient infrastructure or institutions be identified and promoted within peer groups or communities, to allow the dissemination of best practice. A database of exam-**



**ples of resilient organisations should also be developed via the CIRINT.NET network.**

### **3.4. Developing a Process to Communicate between Authorities and Critical Infrastructure Operators on Risk and Resilience Issues**

There is still a lack of communication about existing risks and resilience issues. Difficulties are first related to identifying the subject that has to start the communication. The second difficulty is to understand to whom there is a need to communicate on risks and resilience: (the population, other operators, the media, etc.). The third difficulty is related to the form of communication (how to communicate?) and the content of the communication (what information has to be communicated). Stakeholders emphasised the importance of communication during emergencies.

It is thus necessary to improve communication on risks and resilience, by understanding better the need to communicate with each category of stakeholders. It is also important to improve communication during emergencies as well as before and after a crisis, in order to create a habit of communicating on CIR issues. Technological progress is also needed to improve existing communication tools and ensure the security of the exchanged information.

A common language is required to communicate risk and resilience information between partner organisations such as authorities and CI operators (e.g. common and harmonised emergency thresholds). There is a need to develop an agreement on the type of information to be communicated to the different stakeholders for each phase of a crisis or disruption. In addition there is the opportunity to make greater use of social networks and new ways of communication. If this process is perfected it would mean that stakeholders would have the right information, and it would be delivered to the right stakeholder at the right time to support resilience implementation.

#### **Recommendation 8:**

**It is recommended that common language/processes are developed to allow more effective communication between authorities, CI operators and other stakeholders in relation to risk and resilience, and that CIRINT.NET be used as a means of progressing this issue.**

## **4. EU Level PPP Collaboration**

### **4.1. Developing greater and more coherent Intra-State standardisation regarding CIR Strategy, and Legal/Procedural issues**

The situation presently found within the EU involves each member country potentially having different laws and guidance/rules in relation to both public and private sector critical infrastructure resilience. In addition CIR strategies can vary at all levels and there can



be influences from outside the EU. This creates a lack of standardisation in approach and potential conflicts between different countries legislation and compliance frameworks.

There is no standardised resilience framework (either regional, national or international) to address resilience related issues, while taking fully into account legislation and rules implemented by operators. This impedes co-operation and co-ordination between CIR stakeholders, and can lead to confusion, redundancy or major gaps in strategies.

#### **Recommendation 9:**

**It is recommended that consideration be given to developing a standardised multi-level resilience framework within the EU and its member states, taking into account legislation and rules implemented by operators. The CIRINT.NET network should be used to ensure that a wider discussion of frameworks takes place amongst partners, including both regulatory and self-regulating approaches, in order to expose good practices for wider consideration of harmonisation opportunities.**

### **4.2. Development of Wider Collaborative Research and Sharing of Good Practice amongst EU Member States**

There is a need to undertake wider collaborative research and sharing of good practice amongst EU member states. While there are pockets of good practice and experiential learning, this research is not necessarily co-ordinated and managed. A key vehicle to effective information sharing and co-ordination of research findings is the current network of EU CIP's. These individuals have the potential ability to identify appropriate partners for research and information dissemination.

#### **Recommendation 10:**

**It is recommended that the support of the EU CIP's be developed to encourage future collaborative research opportunities and the sharing of good practice. The CIRINT.NET network should be used as a communications channel between the CIP's and Member States security stakeholders.**

### **4.3. Developing from Protection to Resilience**

Due to the increased complexity of critical infrastructure disruptions, the strategies to address them and mitigate their impact have evolved. The focus of mitigation strategies have moved from the concept of protection to one of resilience. The alignment of such protection and resilience approaches can provide greater returns and opportunities at both an organisational and regional level.

#### **Recommendation 11:**

**It is recommended that CIRINT.NET be used to emphasise the strength of aligning both protection and resilience approaches within CI organisations,**



**and to invite the exchange of experience between members to further illustrate the benefits and operational aspects of such an approach.**

#### **4.4. Developing a Common Understanding of the ‘Resilience’ Concept**

There are still fragmented views on the meaning of the resilience concept. Not all stakeholders understand the concept in the same way, which may create difficulties to communicate and agree on how to achieve resilience. The “lack of understanding” was identified as one of the main barrier preventing the set-up of a CIR Stakeholder process, together with lack of resources and the lack of organisation.

There is thus a need to build and define a common understanding of resilience. There is also clearly a requirement for agreed terminology across Europe in terms of Critical Infrastructure Resilience (CIR) language – without a clear understanding of terminology, it will be difficult to articulate a common vision and sense of purpose around what all stakeholders are seeking to achieve. The respondents also mentioned the need to articulate physical and societal resilience and to move from an approach too much based on risk towards a more consequence-based approach.

#### **Recommendation 12:**

**It is recommended that an agreed common terminology be developed relating to the concept of ‘Resilience’. This should apply across all stakeholder groups and across all levels (Government, Industry (Private and Public), Responder Organisations and Communities). CIRINT.NET should be used as a key means of exchanging perspectives in this area between stakeholders in Europe.**

This does not mean “creating” a new definition of resilience, universally accepted. It highlights instead the importance to base the CIR stakeholder collaboration on a common understanding and expectations of the main concepts to be used by a group, so that, at least among the member of the given group, there are common views of what resilience is.

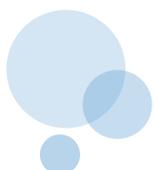
#### **4.5. Developing a more Co-ordinated Collaboration Process between CI Operators and Emergency Management Authorities**

The disruption of essential services supply has created new types of emergency situations. These situations are characterized by a high degree of uncertainty, mainly due to the cascading effects from one critical system to another. These often extend the disaster area well beyond the limits of the initial event. CI interdependencies can potentially increase the severity of the damages triggered by a critical infrastructure disruption: for instance, during the tsunami and the earthquake in March 2011 in Japan, the widespread blackout caused by the earthquake caused loss of traffic control, shutdown of elevators, loss of access to media, disruption to mobile phones, etc. (Kitamura, 2011).



**Recommendation 13:**

**It is recommended that collaboration programmes among the various operators and emergency management authorities be developed due to differing systems' interdependencies and the complexity of the risks that individual organizations cannot address on their own, and that future work of the CIRINT.NET supports the spread of good practice by sharing information on how successful partnerships have created a collaborative model that develops information sharing, and enhances organisational knowledge of interdependencies.**



## 5. Miscellaneous Recommendations

### 5.1. Development of Intra-State clarification and harmonization of rules, procedures, legislation and compliance frameworks to assist operators and authorities

From the CI operators' point of view, there are too many (operational) procedures, as well as too many conflicting rules from government (coming from different ministries for example)<sup>1</sup>. New measures or new security standards are also seen as additional work. Operators recognise that current legislation already addresses several aspects of resilience. However, this legislation does not take into account the harmonisation of the different measures to be taken, for instance the coherency between civil protection plans and security plans from operators.

There is thus a need to clarify and harmonize existing rules and procedures to simplify the work of the operators but also from the point of view of the authorities in charge of compliance.

#### **Recommendation 14:**

**It is recommended that consideration be given to the harmonisation and standardisation of existing rules, procedures, legislation and compliance frameworks between EU states, to simplify the work of operators and different government departments. It is further recommended that a coherent approach be developed between national, regional, and local strategies to enhance co-operation and coordination between CIR stakeholders to identify redundancies or major gaps in strategies. The CIRINT.NET network should be a key tool in developing this harmonisation process.**

### 5.2. Engagement with Non-Miracle Partner Countries

Whilst consultation took place with 17 countries (including non-EU countries), a great many of the responses were from the three Miracle partner countries. However, it is important to engage further with non-Miracle partner countries in order to obtain a representative viewpoint.

#### **Recommendation 15:**

**It is recommended that further research be undertaken with non-Miracle partner countries through CIRINT.NET as a key dissemination vehicle to engage with non-partner countries and broaden geographical coverage.**

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<sup>1</sup> For instance an airport operator explained that they have 9 different types of security protocols to implement. This results in difficulties to comply with the existing rules and may take away responsibility from the operators.



### 5.3. Engagement process for future research

The research undertaken in this project had a significant number of responses from public sector organisations. However, this was to be expected given the proportion of public and private sector organisations engaged with the research process. Future research should attempt to engage with more private sector organisations to check for any potential differing trends between the two.

#### **Recommendation 16:**

**It is recommended that future research into the issue of critical infrastructure resilience should focus on engagement with the private sector to allow a balanced consultation process between sectors, and as the CIRINT.NET network aims to represent partnerships around critical infrastructure of all kinds, the future work of CIRINT should focus on developing partnerships within existing critical infrastructure which will involve both private operators and public authorities.**

### 5.4. The Development of Public-Private Partnerships

There appeared to be a generally common understanding of the term 'Public-Private Partnership'. This viewed the arrangement as being a collaborative process between partners. In the case of the private sector, respondents placed a greater emphasis on the formal aspect of the partnership, than public sector respondents. However, generally the arrangement was seen as a positive process.

#### **Recommendation 17:**

**It is recommended that CIRINT.NET be used to support the development of Public-Private Partnerships by supporting the exchange of good practice both in terms of how formalisations benefit partnership working, and how the actual collaborative processes work in practice.**

### 5.5. Co-operation between Partners

The survey shows that the respondents find there is too little cooperation between partners (public-public; public-private; and private-private). In addition, cooperation between local-regional-national-international levels could also be improved. This lack of cooperation is mainly due to a lack of awareness and urgency, and also due to difficulty in communicating.

It is also the result of "people thinking within boundaries (organisational/geographical), while incidents do not respect these boundaries". There is thus a need for more cooperation on CIR issues. This could be achieved by overcoming the existing organisational fragmentation. Raising awareness on CIR issues should result in more cooperation.



### **Recommendation 18:**

**It is recommended that further research should be carried out, including through the use of CIRINT.NET, into strategies whereby regional stakeholders can safely identify roadblocks that limit partner collaboration.**

#### **5.6. Developing coordination when addressing CIR issues**

Following stakeholders' input, it was established coordination to address CIR issues still remains difficult. This is because responsibilities and roles are not always clearly identified. There is still confusion/difficulty around the answer to the question: "who owns the problem? Who is responsible for its management?" In addition, there is either a supposition of roles or a tendency not to assume personal responsibility.

Too much personnel turnover makes it difficult to identify a person who will regularly be in charge within each institution or organisation. Improving the coordination process would require each stakeholder defining their role, responsibility and who they are answerable to.

### **Recommendation 19:**

**It is recommended that through CIRINT.NET, greater co-ordination is encouraged between organisations when addressing CIR related issues to ensure focus on the practical solutions to organising roles and responsibilities.**

#### **5.7. Development of a PPP Model to Enhance Resilience and Collaboration**

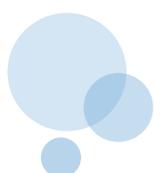
A PPP Model can be applied to Critical Infrastructure to enhance resilience and collaboration. It can be developed using 5 self-examination stages. These are:

- Why is a stakeholder collaboration process needed?
- Who is involved?
- How is it governed?
- What are the activities implemented?
- When and for how long is the stakeholder collaboration process set up?

This model provides a structure round the creation of a CIR collaborative process and ensures the correct questions are asked of participants.

### **Recommendation 20:**

**It is recommended that the PPP model using a 5 self-examination stage process should be used as a focus for CIRINT.NET work to provide a common approach to enhancing resilience and collaboration.**



## 5.8. Understanding Risk Governance

Research found that due to differing interests and interpretations of risk governance, there could be potentially conflicting views regarding the governance of organisational risk. This was partly due to the very different types of stakeholders.

### **Recommendation 21:**

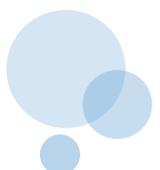
**It is recommended that the CIRINT.NET be used to assist in the improvement of multiple stakeholder involvement from different sectors in risk governance processes. This should be achieved by examining good practice in this area, and allowing open exchange between stakeholders.**

## 5.9. Using a PPP Process to Protect Critical Infrastructure from Attack

Critical Infrastructure protection can also be enhanced through the use of a PPP process. The use of such a PPP process to protect critical infrastructure from attack has been developed using the 10 guiding elements (principles) identified by UNICRI (UNICRI, 2010). This process provides a structured strategy for use by Critical Infrastructure PPP partners.

### **Recommendation 22:**

**It is recommended that CIRINT.NET be used to promote the UNICRI – 10 Guiding Principles of CI protection, and comparable approaches, so that its growing community can test and exchange experience to ensure wider EU appreciation of best practice/approaches.**



## 6. Conclusions

This deliverable has attempted to identify potential areas where CI Resilience Collaboration can be improved at the various levels (Regional, National, and EU). Recommendations have been developed to undertake this improvement. The data on which the recommendations were made is based on the participant surveys carried out as part of the Miracle project.

Unfortunately for most of the recommendations, there is no mandatory authority which can enforce the recommended improved practices. Instead soft skills such as developing trust and communication lines should be used to obtain maximum engagement. It is notable that since the commencement of the Miracle project, there have been many more informal connection lines developing between infrastructure partners.

However, one theme that was carried across the entire project was the need to develop and establish an International Critical Infrastructure Resilience Network to act as a coordinating mechanism for information sharing and dissemination of advice and guidance. Due to this demand, the Critical Infrastructure Resilience International Network (CIRINT.NET) has been established by the Miracle project partners and this network could act as a critical driver in the development of critical infrastructure resilience in the future.



## 7. References

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