

## **09 – POSITIVE EFFECTS ON LAND USE PLANNING ARISING FROM THE 2009 FLOOD RISK MANAGEMENT GUIDELINES**

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### **Abstract**

Following over 175 years of flood risk management policy and 50 years of land use planning, in 2009, Statutory Guidelines came into force in Ireland requiring land use plans to be subject to Strategic Flood Risk Assessment (SFRA). This was the first time that flood related considerations were required to be integrated into land use planning. SFRAs identify, assess and communicate flood risk to decision makers and the public.

An analysis of nine case study land use plans found that SFRA has resulted in the integration of a greater number and range of provisions (written policies and objectives are required to be complied with by individual projects to be considered for planning permission under the relevant plan) into land use plans that seek to contribute towards flood risk management. These provisions include those requiring projects to undergo lower tier Flood Risk Assessment and to take account of the effects that climate change may have on flood risk. The average number of flood risk management provisions for case study plans rose from under two pre-Guidelines to over 15 post-Guidelines.

The analysis of the nine Plans combined with interviews of key players found that SFRA has resulted in the removal of a significant extent of incompatible land use zoning from lands that are subject to elevated levels of flood risk. In Flood Zone A, where risk is highest, there has been significant decreases in zonings that are potentially incompatible such as Residential (falling from 19.5% of the total Flood Zone A area to 4.1%) or Industrial/Commercial (from 22.4% to 9.6%) with associated increases in Open Space/Recreation/Amenity zoning (this zoning is compatible with elevated levels of flood risk). In the lower risk Flood Zone B there was a similar trend, with changes identified less significant in extent.

Interviews with the key players confirmed a number of challenges with respect to both Case Studies and Planning/SFRA in general that are being overcome, including those relating to:

- Information on flood risk;
- Land use zoning in already developed urban areas located within Flood Zones A and B;
- Potential non-compliances due to decisions by Elected Members; and
- Communication of the seriousness of flood risk, especially where lands are not known to have previously flooded.

## **1. INTRODUCTION**

### **1.1 Introduction to Flooding in Ireland**

A flood is an overflow of a large amount of water beyond its normal limits, especially over what is normally dry land (Oxford Dictionaries, 2016). Flooding is natural phenomenon, the effects of which can be exacerbated by human development and/or mitigated by human actions. Flooding has the potential to result in various effects including those relating to human health, the economy and society (OPW, 2004). Flood risk can change over time and the frequency, pattern and severity of flooding are expected to increase in Ireland as a result of climate change (Environmental Protection Agency, 2017; National University of Ireland, 2008).

### **1.2 Options for Flood Risk Management**

Various options can be used alone or in combination with each other for managing flood risk. Such options include those identified under the following overarching categories (Dunne and Leopold, 1978; Lane et al., 2007; OPW, 2011; Pitt, 2008; Rickard, 2007a; Rickard, 2007b; Tapsell and Ball, 2007): land use planning and building regulation; coastal and estuary flood engineering; improving management of flood events and mitigation of losses; rural flood abatement; river flood abatement; and urban flood management. Land use planning seeks to determine what type of development should be allowed to take place at different locations. Land use planning can reduce the exposure of new and existing development to increased levels of flood risk by directing new development away from flood prone areas and by ensuring that new development does not increase flood risk to existing development. Land use planning can be informed by the delineation of areas of specified flood risk through flood risk assessment.

### **1.3 Land Use Planning in Ireland**

Since the coming into force of the first Planning and Development Act in Ireland in 1969, lands within and surrounding Irish settlements have been zoned for development and built upon to accommodate the urbanisation of the country's population and associated economic activity. Zoning is applied through broad written land use zoning objectives (e.g. Residential, Commercial/Industrial, Town Centre, and Open Space/Amenity/Recreation) identify types of uses accompanied by land use zoning maps that identify which uses are being directed towards relevant lands. Zoning takes place within a hierarchy of plans, with Local Area Plans providing zoning for individual settlements and County Development Plans often providing zoning for multiple settlements.

For the 35 years following the Planning and Development Act 1969, there was no requirement to take account of flood risk when zoning lands, although individual projects granted permission under Plans were required to comply with environmental protection legislation and regulation. Zoning and subsequent development of floodplains occurred.

### **1.4 Flood Risk Management Guidelines (2009)**

In 2009, the Office of Public Works (OPW) and the then Department of the Environment, Heritage and Local Government (DEHLG) published national Statutory Guidelines on flood risk management for planning authorities entitled 'The Planning System and Flood Risk Management - Guidelines for Planning Authorities'. The Guidelines introduced for the first time requirements relating to the undertaking of formal Strategic Flood Risk Assessment (SFRA) for land use plans at each level of the land use planning hierarchy as well as site-specific FRAs for certain projects. SFRAs identify, assess and communicate flood risk to decision makers and the public in order to

facilitate the integration of flood related considerations into land use plans (DEHLG and OPW, 2009).

The Guidelines provide for a risk-based, sequential approach to land use planning, following “Avoid-Substitute-Justify-Mitigate-Proceed”, principles including:

- Avoidance of incompatible zoning objectives (e.g. residential) for lands subject to higher levels of flood risk - this is achieved by choosing lower risk flood zones for development or by substituting development which is not vulnerable (e.g. water-compatible development such as docks and marinas, sports pitches, open space);
- Undertaking of Justification Tests to examine whether vulnerable development would be appropriate in areas subject to higher levels of flood risk where avoidance is not practical;
- Identification of lands where a more detailed FRA would be required to be undertaken, in advance of development.

The 2009 Guidelines do not allow development to be permitted in areas subject to higher levels of flood risk, except where developments are water-compatible or where a Justification Test<sup>1</sup> is passed.

The sequential approach is applied through flood risk zones, where the type of development allowed is determined by the assessed level of flood risk. The Guidelines define fluvial and coastal flood zones for the purposes of FRA; other types of flooding such as pluvial and groundwater are to be dealt with by text-based provisions at Plan level and considered in more detail at project level. The three flood zones and associated planning implications defined by the Guidelines are summarised on Table 1 below. Where there is a well-defined river or coastal floodplain, the limits of Zones A and B will tend to coincide; however, where there land extends for a distance with a small slope, Zone A will tend to be different to Zone B (DEHLG and OPW, 2009).

**Table 1: Summary of Flood Zones as described in the OPW Guidelines, 2009**

Flood Zones	Overall Probability	Fluvial Probability <sup>2</sup>	Coastal Probability	Planning Implications
Flood Zone A	Highest	≥ 1% AEP or 1 in 100 year	≥ 0.5% AEP or 1 in 200 year	<ul style="list-style-type: none"> <li>• Most types of development are inappropriate in Zone A.</li> <li>• Only water-compatible development (e.g. dock, marinas, sports pitches and open space) is appropriate.</li> <li>• Development to be generally avoided</li> <li>• Exceptions that pass the Justification Test will relate to urban centres or essential infrastructure that cannot be located elsewhere.</li> </ul>
Flood Zone B	Moderate	≥ 0.1% AEP or 1 in 1000 year and <1% AEP or 1 in 100 year	≥ 0.1% AEP or 1 in 1000 year and < 0.5% AEP or 1 in 200 year	<ul style="list-style-type: none"> <li>• Highly vulnerable development (e.g. hospitals and emergency services, residential care homes, houses and primary infrastructure) is inappropriate in Zone B unless it passes the Justification Test.</li> <li>• Less vulnerable development (e.g. retail, commercial and industrial uses, secondary infrastructure and water-compatible development) is appropriate, if sites not available in Zone C.</li> </ul>
Flood Zone C	Lowest	< 0.1% AEP or 1 in 1000 year	< 0.1% AEP or 1 in 1000 year	<ul style="list-style-type: none"> <li>• All types of development are generally appropriate in Zone C (subject to assessment of flood risk from pluvial, artificial drainage system and groundwater flooding)</li> </ul>

<sup>1</sup> For the Justification Test to be passed, the following criteria must be met:

- The lands must be within the urban centre of a settlement which is targeted for growth;
- The development of the lands is required to achieve the sustainable development of the urban centre and there are no alternative and appropriate sites available in areas which are subject to lower levels of risk; and
- An SFRA has been undertaken which demonstrates that residual flood risk can be mitigated and managed through design.

<sup>2</sup> Flood probability is expressed as Annual Exceedance Probability (AEP). AEP indicates the likelihood of a flood occurring in any given year that is equal to or more severe than a given magnitude. A 1% AEP indicates the magnitude of a flood that is expected to be exceeded on average once in 100 years, i.e. it has a 1 in 100 (1%) chance of occurring in any one year (OPW, 2012).

The Guidelines specify the type of sources that could inform SFRA and identify (Technical Appendix A, Table A3) that as long as a precautionary approach is taken, decisions on land use zoning can be made on limited data.

In 2014, the Department of the Environment, Community and Local Government and the OPW issued Official Circular PL 2 of 2014 to make a number of amendments to the Guidelines. The main feature of the Circular was the provision of a more proactive approach towards SFRA for existing, developed, zoned areas at risk of flooding. This approach recognises the necessity to continue to provide protection for highly vulnerable development such as residential development in older parts of towns (including infill, regeneration and small extensions) in advance of development. The approach requires the identification and implementation of the structural or non-structural flood risk management measures that will ensure avoidance of increases in flood risk as that flood hazard and risk to the area and to other adjoining locations will not be increased or, if practicable, will be reduced.

The Guidelines are implemented by the planners in planning authorities who prepare draft plans and arrange the undertaking of SFRA by internal or external specialists. In addition to having prepared the Guidelines, the Department of the Environment (currently Department of Communications, Climate Action and Environment) and OPW are both statutory consultees in the preparation of land use plans. The Elected Members of planning authorities decide on what type of plans to adopt, taking into account the draft plans (and associated SFRA) which are prepared by planners (with specialist input) and submissions, including those from the Department of the Environment and OPW. Under Section 28 of the Planning and Development Act 2000 as amended, the Minister for the Environment, Community and Local Government has the power to intervene and issue a Ministerial Direction altering a land use plan that has been adopted by the Elected Members where it does not comply with legislation or Guidelines. At lower tiers of decision-making, landowners are required to comply with the provisions of land use plans when submitting planning applications to planning authorities for consideration – including providing a flood risk assessment where relevant. The land use planning/SFRA process implementation framework, processes and relevant players is shown on Figure 1.

## **2. METHODOLOGY**

An evaluation of the effect that Strategic Flood Risk Assessment (SFRA) has had on land use planning in Ireland 2009-2016 is achieved through:

1. An analysis of Case Study documentation for nine land use plans, comparing two consecutive iterations of these plans; the most immediate iteration of the Plan that was adopted before the coming into force of the Guidelines in 2009 and the most immediate iteration of the Plan that was adopted after the coming into force of the Guidelines in 2009. The case study plans are for settlements located across three planning authority areas: Bearna, Clifden, Gort and Headford, in County Galway; Edgeworthstown and Lanesborough, in County Longford; and Boyle, Castlerea and Roscommon Town in Roscommon. Documentation analysed includes:

- The written provisions contained within the plans (i.e. the policies and objectives) in relation to flood risk management<sup>3</sup>;
  - The mapped land use zoning contained within the plans<sup>4</sup>; and
  - Other documentation prepared during the consultation process for the relevant plan, including SFRA Reports and Consultation Reports on Submissions.
2. Interviews with: planners<sup>5</sup> (who oversee the preparation of the Draft Plan and associated SFRA); Elected Members<sup>6</sup> (who consider all documentation and decide on what type of Plan to adopt); and the Office of Public Works<sup>7</sup> (who have prepared the Guidelines and can advise the Minister as to what plans need amendment for compliance with the Guidelines after adoption).

This study provides an evaluation using nine case studies and interviews with those involved in the case studies and other SFRA. It is not a complete study of all SFRA undertaken to date. There are limitations associated with the conclusions that can be taken from as the study only considers nine plans, however; it provides an in-depth analysis from which realistic theoretical insights can be gained.

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<sup>3</sup> These following indicators facilitate the analysis and comparison of lengthy and complex Plan documents:

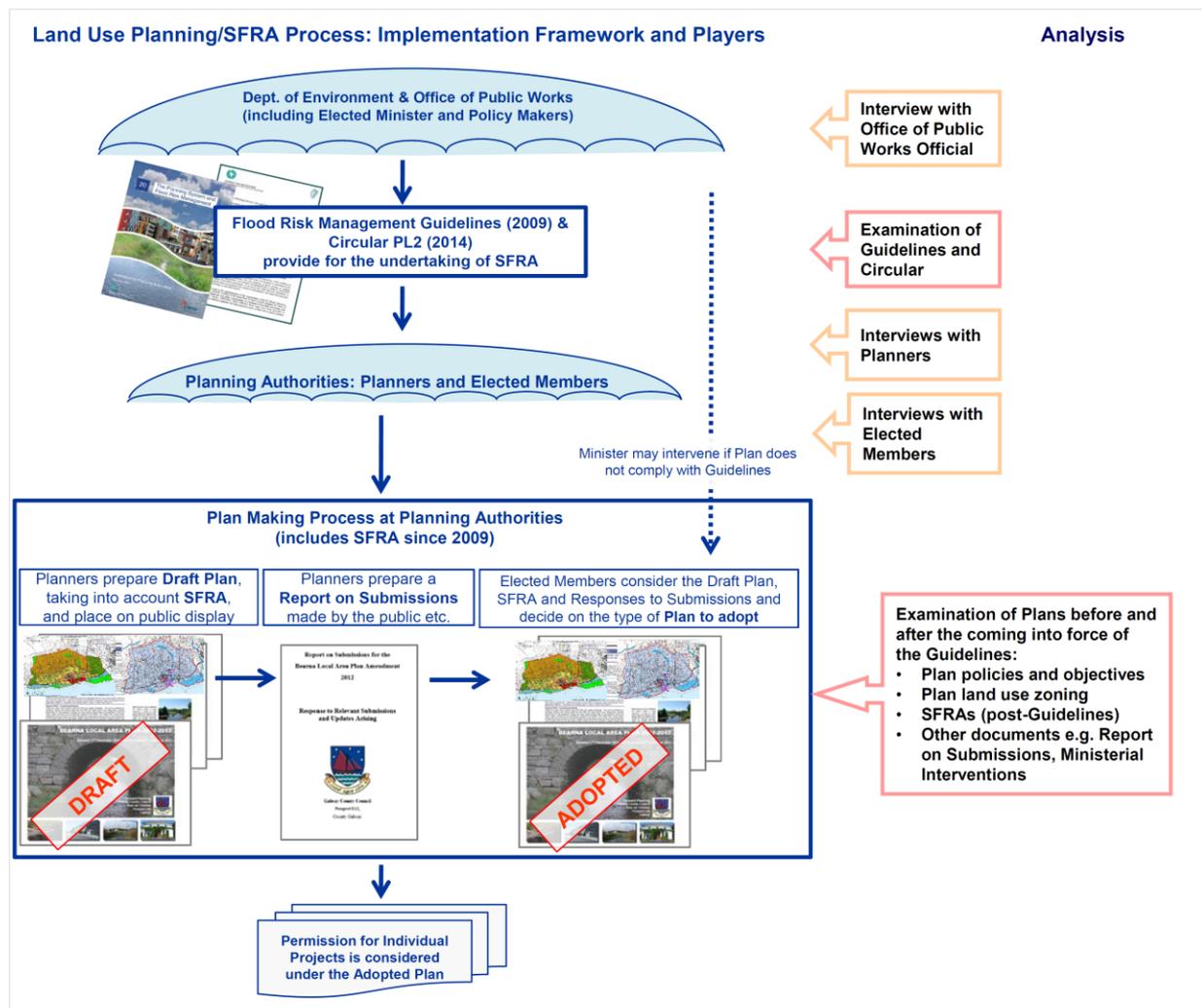
1. Number of Plan provisions that seek to contribute towards flood risk management;
2. Number and range of flood risk management issues addressed issues addressed by Plan provisions; and
3. Whether there is a requirement in relation to lower-tier flood risk assessment for projects to be granted permission under the Plan.

<sup>4</sup> In order to examine whether SFRA has resulted in an extent of incompatible land use zoning being removed from lands that are subject to elevated levels of flood risk, mapped land use zoning for the various settlements is analysed to identify changes in the land use zoning that have occurred within Flood Zones A and B. A quantitative analysis (using Geographical Information System software) is undertaken in order to identify the areas of land (m<sup>2</sup>) and proportionate areas of land (%) within Flood Zones A and B that are designated with various land use zoning objectives.

<sup>5</sup> One planner from each of Galway, Longford and Roscommon County Councils. No Elected Member was available for interview in Roscommon County Council.

<sup>6</sup> One Elected Member from Galway and Longford County Councils

<sup>7</sup> One policy maker and Plan-preparation/SFRA process consultee in the Office of Public Works



**Figure 1:** Land Use Planning/SFRA: Summary Diagram of Implementation Framework, Processes, Players and Analysis

### 3. FINDINGS AND ANALYSIS

#### 3.1 Written Plan Provisions<sup>8</sup>

Table 2 provides an analysis of case study plan provisions under three indicators, allowing for the comparison of provisions both Pre- and Post-Guidelines and across different plans and planning authority areas. The written policies and objectives are required to be complied with by individual projects to be considered for planning permission under the relevant plan.

The analysis of all three indicators shows a greater number and range of flood risk management provisions in land use plans for all case studies since the coming into force of the Guidelines. Although the analysis only relates to a relatively small number of plans, the differences are significant and are found across three planning authority areas.

<sup>8</sup> Appendix I contains the detailed written Plan provisions for each Case Study.

### **3.1.1 Indicator No. 1: Number of Plan Provisions that seek to contribute towards Flood Risk Management**

The number of plan provisions that seek to contribute towards flood risk management increases significantly in all instances.

The average number of flood risk management provisions for case study plans pre-Guidelines is under two provisions, however; this average is affected by the Pre-Guidelines Clifden Local Area Plan, an outlier containing seven provisions. This Plan was adopted months before the coming into force of the Guidelines in 2009 and it is possible that awareness of the emerging Guidelines contributed towards greater attention in this area of policy development.

The average number of provisions in each plan post-Guidelines exceeds 15, indicating that the coming into force of the Guidelines resulted in an increased number of flood risk management provisions.

### **3.1.2 Indicator No. 2: Number and Range of Flood Risk Management Issues covered by Plan Provisions**

The number and range of flood risk management issues covered by Plan provisions seeking to contribute towards flood risk management increases significantly in all instances.

Eleven main issues (see Table 2) were identified as being addressed to varying degrees by case study plans. Plan policies and objectives provide requirements relating to these issues that must be complied with by individual projects granted permission under these plans.

The average number of flood risk management issues covered by case study plans rose from under two pre-Guidelines to over eight post-Guidelines.

Pre-Guidelines, the most common issues addressed by case study plans were: “1. European/National Legislation etc.”; and “2. Surface Water Drainage and Sustainable Urban Drainage Systems (SUDS)”.

All of the case study plans address the following five issues post-Guidelines: “1. European/National Legislation etc.”; “2. Protection of water bodies including buffers”; “3. Improvement and/or restoration of natural flood risk management functions”; “4. Surface Water Drainage and Sustainable Urban Drainage Systems (SUDS)” and “5. FRA of lower tier plans or projects”.

Plans within each of the three planning authority areas (Galway, Longford and Roscommon County Council) tend to address similar issues to those that are prepared in the same area.

The preparation of new provisions that were previously not included in land use plans and which address a wide range of issues indicates professional input and innovation with respect to ensuring that plans comply with the provisions of the Guidelines.

### **3.1.3 Indicator No. 3: Whether there is a Requirement for lower-tier FRA for projects**

The approach required by the Guidelines creates specific rules for the designation of broad land use zoning objectives requiring that where zoning objectives are being proposed within flood zones then

detailed flood risk assessment is undertaken. To undertake the most detailed level of flood risk assessment can be difficult at plan level no matter how good the flood model is, as the mix, configuration and layout of developments are not known.

Because of the absence of detailed information about future projects at plan level and associated data on flood risk, there is a need to ensure that project proposals are subject to site-specific flood risk assessment.

The analysis of plan provisions pre- and post-Guidelines shows that:

- Pre-Guidelines, none of the case study plans require the taking into account of Flood Risk Assessment on individual projects; and
- Post-Guidelines, all of the case study plans require the taking into account of Flood Risk Assessment on individual projects.

**Table 2: Analysis of Written Plan Provisions for all Case Studies Pre- and Post-Guidelines<sup>9</sup>**

Planning Authority	Settlement	Indicator 1: Number of plan provisions		Indicator 2: Number and range of issues addressed by plan provisions		Indicator 3: Requirement for lower-tier FRA	
				Key to Issues: 1 = European/National Legislation etc. 2 = Protection of water bodies including buffers 3 = Improvement and/or restoration of natural flood risk management functions 4 = Surface Water Drainage and SUDS 5 = FRA of lower tier plans or projects 6 = Climate Change 7 = Specific Projects or Sectors and Flood Risk 8 = Groundwater and Pluvial Flood Risk 9 = Lands Transected by Flood Zones 10 = Where Flood Zones have been amended to take into account information submitted by landowner 11 = Constrained Land Use Zoning and associated flood risk management measures in areas at elevated risk of flooding (Internal Layout, Flood-Resistant Construction, Flood-Resilient Construction, Emergency Response Planning, Access and Egress during Flood Events)			
		Pre-Guidelines	Post-Guidelines	Pre-Guidelines	Post Guidelines	Pre-Guidelines	Post-Guidelines
Galway County Council	Bearna	2	10	1 and 4	1, 2, 3, 4, 5, 6, 7, 8 and 10	No	Yes
	Clifden	7	20	1, 2, 3, and 4	1, 2, 3, 4, 5, 6, 7 and 8	No	Yes
	Gort	1	12	7	1, 2, 3, 4, 5, 6, 7, 8 and 9	No	Yes
	Headford	1	19	4	1, 2, 3, 4, 5, 6, 7, 8 and 11	No	Yes
Longford County Council	Edgeworthstown	1	16	4 and 7	1, 2, 3, 4, 5, 6, 7, 8 and 9	No	Yes
	Lanesborough	0	16	Not applicable – no provisions	1, 2, 3, 4, 5, 6, 7, 8 and 9	No	Yes
Roscommon County Council	Roscommon	1	11	1	1, 2, 3, 4 and 5	No	Yes
	Boyle	1	16	1	1, 2, 3, 4, 5, 6, 8 and 11	No	Yes
	Castlerea	1	21	1	1, 2, 3, 4, 5, 6 and 8	No	Yes

<sup>9</sup> Galway County Council (2005, 2006, 2007, 2009, 2012a, 2012b, 2013a, 2013b, 2014a, 2014b, 2015a and 2015b), Longford County Council (2008a, 2008b and 2015) and Roscommon County Council (2008a, 2008b, 2008c, 2014a, 2014b, 2015a, 2015b, 2016a and 2016b)

## 3.2 Land Use Zoning Maps, supported by associated Plan/SFRA documentation

### 3.2.1 Findings

Within the areas that are subject to the various plans, Flood Zone A comprises c. 82% of the total combined Flood Zone A and Flood Zone B area. The total area of Flood Zones A and B encompassed by the plans before and after the implementation the Guidelines has decreased by c. 8%, from 479ha to 442ha. Table 3 provides the analysis of land use zoning for all Case Studies Pre- and Post-Guidelines.

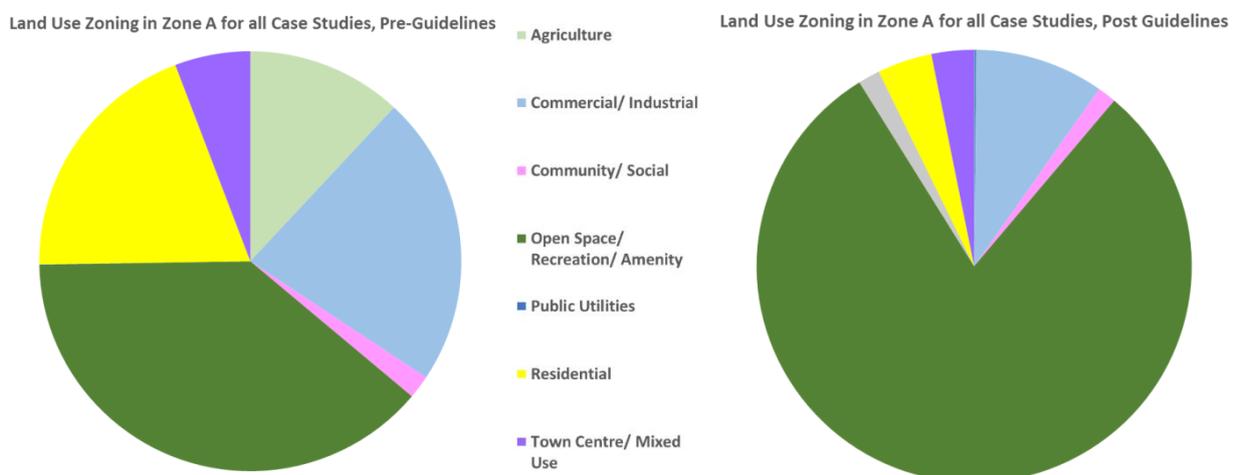
**Table 3: Land Use Zoning for all Case Studies Pre- and Post-Guidelines<sup>10</sup>**

Land Use Zoning for all Case Studies Pre-Guidelines	Zone A m <sup>2</sup>	% of Zone A	Zone B m <sup>2</sup>	% of Zone B	Land Use Zoning for all Case Studies Post-Guidelines	Zone A m <sup>2</sup>	% of Zone A	Zone B m <sup>2</sup>	% of Zone B
Agriculture	472463	11.9	10792	1.3	Agriculture	5784	0.2	14642	1.8
Commercial/ Industrial	888436	22.4	368273	44.7	Commercial/ Industrial	347006	9.6	310511	38.9
Community/ Social	71176	1.8	6795	0.8	Community/ Social	50216	1.4	5385	0.7
Open Space/ Recreation/ Amenity	1530499	38.6	303429	36.9	Open Space/ Recreation/ Amenity	2896030	80.0	377778	47.3
Public Utilities	944	0.0	0	0.0	Public Utilities	58800	1.6	2085	0.3
Residential	771252	19.5	101465	12.3	Residential	146968	4.1	14497	1.8
Town Centre/ Mixed Use	229381	5.8	32305	3.9	Town Centre/ Mixed Use	114386	3.2	74250	9.3
<b>Total</b>	<b>3964151</b>	<b>100.0</b>	<b>823059</b>	<b>100.0</b>	<b>Total</b>	<b>3619190</b>	<b>100.0</b>	<b>799148</b>	<b>100.0</b>

The examination shows significant changes in the proportion of different overarching land use zoning objectives provided for: in Flood Zone A; and, to a lesser extent, in Flood Zone B (see Table 3 and Figure 2). These zoning objectives broadly identify the type of uses being directed towards relevant lands.

In Flood Zone A, there have been significant decreases in zonings that would have the potential to be incompatible:

- The proportion of Residential zoned land falls from 19.5% of the total Flood Zone A area to 4.1%;
- Commercial/Industrial zoned land decreases from 22.4% to 9.6%;
- Town Centre/Mixed Use zoned land falls from 5.8% to 3.2%; and
- Agricultural zoned land, which allows for low-density housing, falls from 11.9% to 0.2%.



**Figure 2: Proportion of Land Use Zoning in Zone A for all Case Studies Pre- and Post-Guidelines**

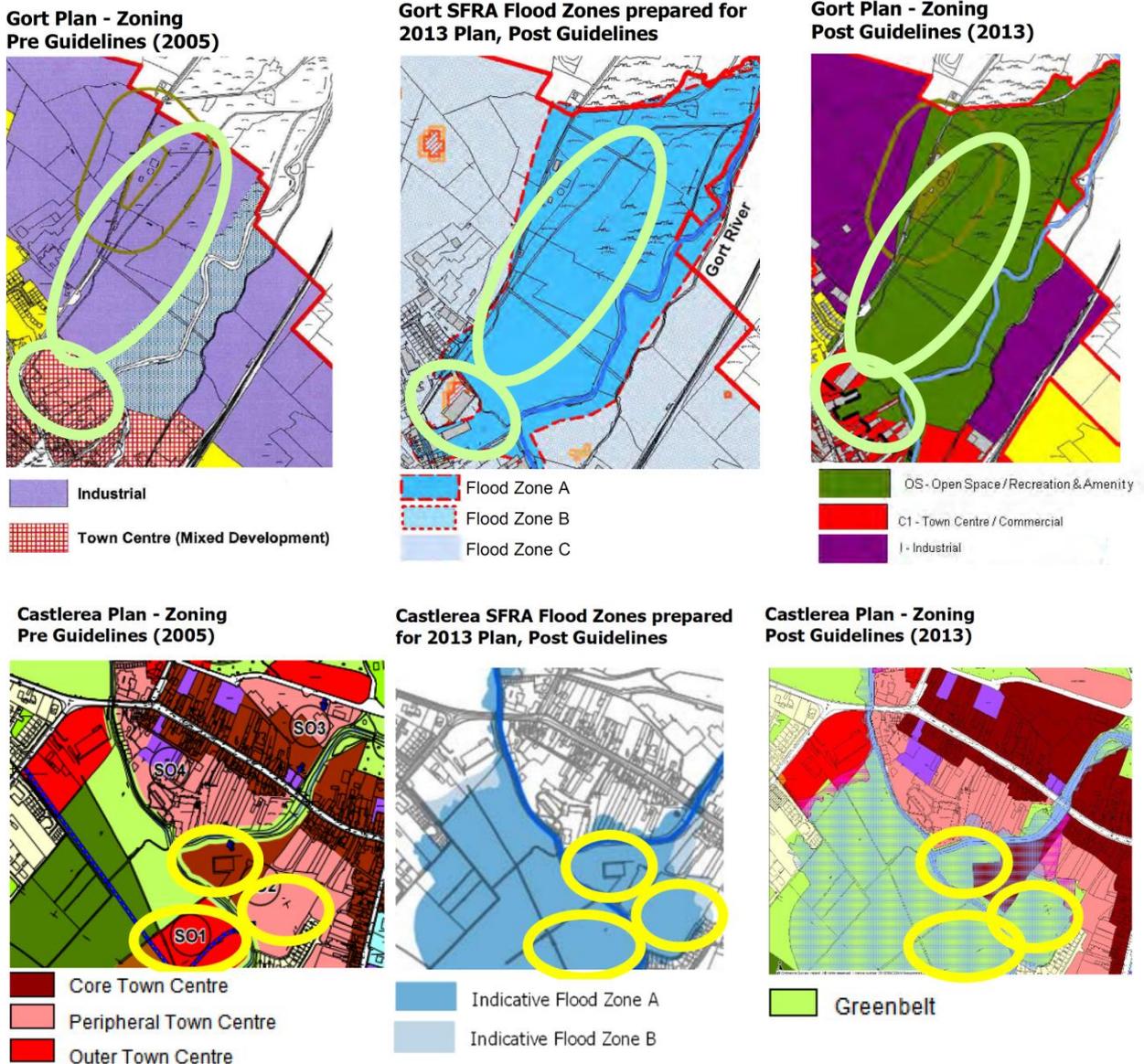
<sup>10</sup> Galway County Council (2005, 2006, 2007, 2009, 2012a, 2012b, 2013a, 2013b, 2014a, 2014b, 2015a and 2015b), Longford County Council (2008a, 2008b and 2015) and Roscommon County Council (2008a, 2008b, 2008c, 2014a, 2014b, 2015a, 2015b, 2016a and 2016b)

With the proportion of incompatible land uses significantly decreasing, Open Space/Recreation/Amenity zoning – which is compatible with elevated levels of flood risk – more than doubles, from 38.6% of the total Flood Zone A area to 80%.

In Flood Zone B, the most significant change is the reduction of Residential zoned land, falling from 12.3% to 1.8%. There has been a corresponding increase in the amount of land zoned Open Space/Recreation/Amenity.

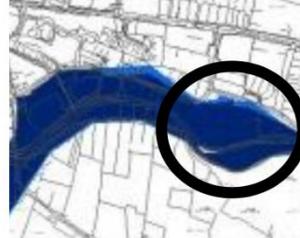
Figure 3 illustrates the land use zoning changes that have occurred with reference to three examples.

**Figure 3: Illustrations of Changes in Land Use Zoning**



Clifden Plan - Zoning  
Pre Guidelines (2009)

RESIDENTIAL

Clifden SFRA Flood Zones prepared  
for 2013 Plan, Post Guidelines

Flood Risk Zone A

Flood Risk Zone B

Clifden Plan - Zoning  
Post Guidelines (2013)

OS - Open Space / Recreation / Amenities

### 3.2.2 Analysis

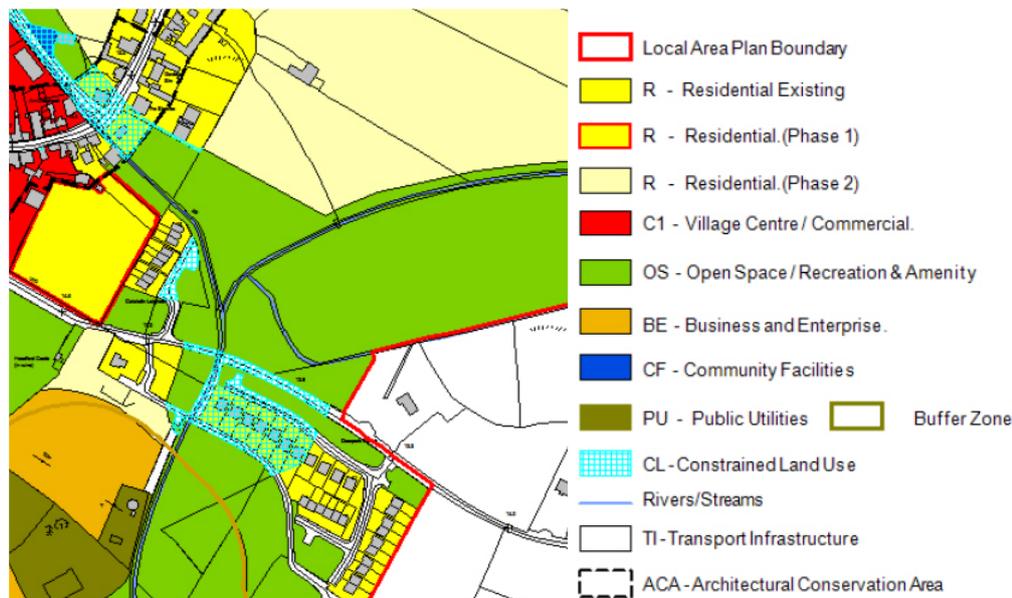
In the context of the Flood Risk Management Guidelines introducing the requirement to undertake SFRA on land use plans between the different iterations of the plans being prepared, the findings suggest that SFRA has facilitated an exclusion of incompatible land uses from Zones A and B. The findings also suggest that the sequential approach that includes the avoidance of incompatible zoning objectives for lands subject to higher levels of flood risk has been followed. These points are confirmed by both available Case Study documentation<sup>11</sup> and the various interviews (see Section 3.3).

Post-Guidelines, Zone B contains significantly lower proportions of Open Space/Recreation/Amenity zoning than Flood Zone A (47.3% versus 80%) however; as detailed in Table 1 “Summary of Flood Zones as described in the OPW Guidelines”, this zone is of a lower risk where uses such as Commercial/Industrial and Social/Community would be appropriate.

Although the analysis only relates to a relatively small number of plans, the differences are significant and are found across all three Planning Authority areas considered.

There remain extents of vulnerable uses such as Residential and Town Centre/Mixed Uses provided for in Zones A and B, including within plans for Headford (County Galway), Boyle and Castlerea (County Roscommon) and Edgeworthstown, and Lanesborough (County Longford). This is due to an application of Residential or Town Centre/Mixed Use land use zoning to historically developed housing/mixed use and adjacent lands in Flood Zones A and B in the context of a **Constrained Land Use Zoning Objective** (or similar). Such plans were adopted/amended after the coming into force of Circular PL/2014 that provides for a more proactive approach with respect to the application of land use zoning. The Constrained Land Use Zoning Objective provides for appropriate management and sustainable use of flood risk areas, limiting new development while recognising that existing development uses within these zones may require small-scale development that would contribute towards compact and sustainable urban development. An example of the Constrained Land Use Zoning Objective is shown on an excerpt of the land use-zoning map from the Headford Plan on Figure 4 below.

<sup>11</sup> Galway County Council (2012a, 2012b, 2013a, 2013b, 2014a, 2014b, 2015a and 2015b), Longford County Council (2015) and Roscommon County Council (2014a, 2014b, 2015a, 2015b, 2016a and 2016b)



**Figure 4: Excerpts from Land Use Zoning Headford Plan 2015-2021**  
Map 1A “Land Use Zoning” from Galway County Council (2015a)

The Consultation Reports for all Case Studies in County Galway (Galway County Council, 2012c, 2013c, 2014c) include **submissions from landowners** disputing the flood zones contained within the SFRA and associated submissions. In one instance (for the Bearna Plan), on foot of a submission and independently undertaken site-specific FRA made by a landowner (Galway County Council, 2012c), lands partially within Flood Zone A were zoned by the Council for Residential development. In response to this zoning, the SFRA recommended and achieved (Galway County Council, 2012b) the integration into the written statement of both:

- An objective<sup>12</sup> requiring project level, site-specific FRA and allowing for flexibility in the case where detailed information is provided; and
- Text<sup>13</sup> warning any potential developers of possible flood related issues.

For the Headford (County Galway) and Roscommon Town (County Roscommon) Plans, the Elected Members proposed a number of amendments to the original Draft Plan that were contrary to the requirements of the Guidelines and the recommendations contained in the SFRA undertaken for the original Draft Plan. A number of changes were proposed to be made that provided for land use zoning in flood risk areas. **The Minister made a submission** instructing against the Proposed Amendments in both cases (Galway County Council, 2015c; Roscommon County Council, 2014c). Elected Members in Galway adhered to the Minister’s recommendation and adopted a plan for Headford that complied with the Guidelines (Galway County Council, 2015a). In Roscommon, the Elected Members decided against the Minister’s recommendation and adopted a Plan that was in conflict with the Guidelines. The Minister subsequently intervened and issued a formal **Ministerial Direction** changing the zoning back to compatible objectives in flood areas (Roscommon County

<sup>12</sup> “In the case of lands transected by the outer boundary of Flood Zone A or B, where it can be demonstrated to the satisfaction of the Planning Authority (by more detailed local topographic survey information) that the outer boundary does not reflect local topographical and /or flood path conditions, the Planning Authority may consider the extension of uses allowed in an adjacent land use zone into the Flood Zone. The proposal will also be subject to the submission of a site-specific FRA and Justification Test as appropriate and the developer satisfying the Planning Authority and him/herself that the probability of flooding is appropriate to the development being proposed and will not increase flood risk elsewhere.”

<sup>13</sup> “These lands have been zoned according to the information contained in a site specific flood risk assessment provided by the land owner and that there is still potential for some of the lands to flood. Available data currently is imperfect and does not allow for the definitive quantification of this potential. This does not preclude development once the proposed site design for any proposed development shows that it does not displace flood water thereby exposing lands elsewhere to unacceptable levels of flood risk and satisfies the developer that the development itself to will not be exposed to unacceptable levels of flood risk.”

Council, 2014a and 2014b). The process for consulting with the Minister on amendments to the Roscommon Town Plan did not prevent a Plan being adopted that zoned areas at elevated levels of flood risk for incompatible uses. However, the last resort action that a Minister can take to ensure compliance proved effective with the Plan changed to be in agreement with the Guidelines on foot of a Ministerial Direction.

### **3.3 Interviews**

Interview topics were informed by the emerging findings of the analysis detailed under Section 3.1 and 3.2. Responses of the interviewees from the Planning Authorities (the Planners and the decision-making Elected Members) and the Office of Public Works (the lead agency in developing flood risk management policy) are summarised below.

#### **3.3.1 Interview Topic 1: Taking Flood Risk into account pre-Guidelines**

The interviews revealed that flood risk was not taken into account in a structured way when zoning lands before the coming into force of the Guidelines, as there was no requirement for this to be done. The Longford County Council Planner (2016) identified that before the Guidelines came into force and in the absence of evidence such as flood zones, it was often challenging to justify limits to zoning on flood risk considerations alone.

In instances where flood risk was taken into account, it was done in an unstructured manner. The Galway County Council Planner (2016) identified that the taking into account of flood risk by the written provisions of the Clifden Plan was influenced by the availability of non-binding Draft Guidelines.

#### **3.3.2 Interview Topics 2 and 3: Changes in both Land Use Zoning in Flood Zones A and B and Written Plan Provisions**

The differences in land use zoning and the number and range of flood risk management provisions (written policies and objectives contained in the Plan) identified by the analysis undertaken as part of this project were generally attributed by interviewees to the undertaking SFRA as required by the Guidelines, including the following of the sequential approach to land use zoning.

For two of the nine Case Studies (those in County Longford), changes in land use zoning due to a combination of two factors, the SFRA and the need to take account of a downward revision to population targets for the County that came about as a result of the economic recession that began in 2008 (Longford County Council Planner, 2016).

#### **3.3.3 Interview Topic 4: Information on Flood Risk**

All interviewees (Planning Authority and OPW) identified that limitations in the certainty of flood risk information for all areas has challenged implementation of the Guidelines.

The OPW acknowledged that the Guidelines initially preceded indicative information on flood risk provided by the CFRAM programme but that this was favoured over a 'do-nothing' approach in order to contribute towards the protection of human health and to minimise further increases in flood risk. However, information is improving and SFRA undertaken using the best available information protects human health and improves flood risk management.

Planners identified limited information outside of Areas for Further Assessment as being a particular challenge. The OPW identified that the cost associated with preparing this mapping is likely to exceed the benefit as areas of lower risk are considered.

Information that is more detailed has the potential to: further aid the zoning of land; avoid sterilisation of lands adjacent to areas at elevated levels of risk; and improve confidence in flood zones.

### **3.3.4 Interview Topic 5: Zoning in Already Developed Urban Areas**

All of the Planners and the interviewee from the OPW (2016) identified that the zoning of already developed lands in urban areas within Flood Zones A and B posed a challenge to the Guidelines.

Circular PL2/2014 further addresses already developed lands in urban areas. Planners and Elected Members welcomed this Circular. The Circular, in combination with innovative approaches to zoning e.g. Constrained Land Use Zoning Objectives, provides a more proactive approach to land use zoning in already developed urban areas. Such approaches were followed by plans in Headford (County Galway), Boyle and Castlerea (County Roscommon) and Edgeworthstown and Lanesborough (County Longford).

### **3.3.5 Interview Topic 6: Non-Compliances and associated Ministerial Interventions**

The interviews confirmed challenges in compliance with the Guidelines due to decisions made by the Elected Members. Such challenges occurred in the preparation and adoption of Plans for Headford and Roscommon Town (see Section 3.2.2). A lack of anecdotal knowledge regarding past flood events in these towns was identified as a contributory factor in the inappropriate zoning of Flood Zones A and B.

### **3.3.6 Interview Topic 7: Other Challenges**

Each of the planners identified the significant time and monetary resources required to undertake SFRAs in the context of especially limited resources since the 2008 economic crash. The lack of skills available within Planning Authorities for undertaking SFRAs was identified by one Planner. The OPW acknowledged the resources required to undertake SFRAs.

Communicating the seriousness of flood risk to the Elected Members and the public was identified as a challenge by the Roscommon and Longford County Council Planners and the Elected Member from Galway County Council. This challenge was perhaps reinforced by the need for the Minister to intervene for two of the nine case study plans (see Section 3.3.5).

Communication of the seriousness of flood risk can be especially challenging in instances where lands are identified by a computational model as having a higher statistical risk of flooding but are not known to have previously flooded. It is important for decision makers to understand what flood zone maps represent and how they are required to be used by the Guidelines - a lack of anecdotal evidence about flood events is not sufficient evidence of there being no flood risk.

Notwithstanding difficulties in communicating the seriousness of flood risk, there are various success stories – as indicated by the significant changes in land use planning outlined under Sections 3.1 and 3.2 above. The Elected Member from Galway County Council identified that certain lands in Flood Zone A in Clifden were requested to be zoned for new residential development by a

landowner in 2014. The landowner had no knowledge of these lands flooding previously and there was no historic evidence of flooding. The SFRA recommended that the lands were zoned as Open Space/ Recreation/ Amenities. The recommendation in the landowner's submission was rejected by the Elected Members. Less than a year after the adoption of the Plan, on 13 September 2015, the lands flooded.

The OPW identified that not to adhere to the Guidelines because of a lack of understanding is irresponsible.

#### 4. CONCLUSIONS

Flood risk was generally not taken into account by land use planning before the coming into force of the Guidelines in 2009 – this was reflected in the lack of flood risk management provisions and inappropriate zoning in floodplains and was confirmed through interviews with key players.

SFRA has resulted in the removal of a significant extent of incompatible land use zoning from lands that are subject to elevated levels of flood risk since it was introduced through the Government's Flood Risk Management Guidelines in 2009. Furthermore, SFRA has resulted in integration of a greater number and range of flood risk management provisions into land use plans, including provisions that require projects to be subject to lower tier Flood Risk Assessment and take account of the effects that climate change may have on flood risk. Although the analysis only relates to a limited number of plans, the differences are significant and are found across three Planning Authority areas. Within the settlements, these differences are likely to contribute towards minimising future increases in flood risk and the occurrence of associated adverse effects including those on human health, the economy, society and the environment. If the changes are indicative of those occurring across the country then there is likely to be significant improvements in flood risk management at a national scale.

Interviews with the key players confirmed a number of challenges with respect to both Case Studies and Planning/SFRA in general that are being overcome. These include the following:

- Planners identified limited information outside of Areas for Further Assessment as being a challenge. OPW acknowledged that the Guidelines initially preceded information on flood risk but that this was favoured over a 'do-nothing' approach in order to contribute towards the protection of human health and to minimise further increases in flood risk. However, information is improving and SFRA undertaken using the best available information protects human health and improves flood risk management. Information that is more detailed has the potential to: further aid the zoning of land; avoid sterilisation of lands adjacent to areas at elevated levels of risk; and improve confidence in flood zones.
- The Planners and the OPW (2016) identified that the zoning of already developed lands in urban areas within Flood Zones A and B posed a challenge to the implementation of the Guidelines. Circular PL2/2014, which was welcomed by Planners and Elected Members, addressed this issue. The Circular, in combination with innovative approaches to zoning e.g. Constrained Land Use Zoning Objectives, provides a more proactive approach to land use zoning in already developed urban areas.

- In certain instances, amendments are proposed and plans adopted by Elected Members that do not comply with the Guidelines. The procedures in place for Ministerial consultations and interventions are ensuring that land use plans ultimately comply with the Guidelines.
- Communication of the seriousness of flood risk can be especially challenging in instances where lands are identified by a computational model as having a higher statistical risk of flooding but are not known to have previously flooded. It is important for decision makers to understand what flood zone maps represent and how they are required to be used by the Guidelines - a lack of local knowledge about historical flood events in certain areas is not evidence of there being no risk of flooding.

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