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Department of Transport

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Department of Transport

Climate Adaptation Strategy

for

October 2022

Regional & Local Roads

Technical Annex 2 - Prioritisation of Climate Adaptation Projects

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Contents

Purpose.....	3
Background	3
Methodology	3
Data Input.....	4
Summarising the Schemes	9
Auditing	10
Appendix A - Process Flow Diagram	11

Purpose

The purpose of this document is to define how Local Authorities should provide information to the Department of Transport when applying for annual funding for climate adaptation projects in accordance with the relevant Circular from the Department.

Background

In October 2020, Atkins were appointed by the Climate Action Regional Office (Atlantic Seaboard South) and the Department of Transport to develop a way of prioritising climate adaptation projects so that funding could be allocated to an annual list of national projects in order of merit.

The methodology which was developed is based on a cost-benefit approach in which the cost of each project is compared with the benefits that the project is expected to generate if it is undertaken. The benefits considered include things like safety improvements, lower chances of damage to the environment, reduced ongoing financial costs of emergency works, fewer delays/diversions for road users, carbon savings due to less need for traffic diversions, and less risk of reputational damage for the Local Authority. The approach is to estimate the combined monetary value of all these benefits and to compare this with the scheme cost in order to work out a Benefit to Cost Ratio (BCR) for each scheme.

Using a cost-benefit type approach has a number of advantages. It is well understood as it is already widely used as a way of deciding if capital works schemes represent good value for money; it can be applied quickly and easily to produce a relative prioritisation of a large number of schemes; and it can also be used for many different types of scheme which means that it could be used in the future to compare the relative merit of climate adaptation funding with other funding streams.

When producing Benefit to Cost Ratio values for schemes, it is always necessary to find an optimal balance between the time/cost required for the appraisal process and the accuracy of the prioritisation results. The methodology which has been developed aims to quickly and easily assess a large number of low to medium value schemes without the need to collect excessive amounts of data or to undertake extensive analysis. The aim is to ensure that the workload for the Local Authorities in providing the required scheme information is modest while at the same time allowing the schemes to be prioritised easily and quickly into an initial prioritised list.

The intention is that this initial list will then be used by the Department of Transport as the basis for their funding decisions; but they may also take into account other considerations which are not included in the cost-benefit approach, such as policy matters, in deciding which schemes to fund.

This does mean that there is a degree of engineering judgement required in the funding decision, but the amount of manual analysis is greatly reduced under this approach as in general it is only schemes on the initial prioritised list which are close to the funding threshold which may need more detailed consideration.

Methodology

The process which has been developed for prioritising climate adaptation projects is based on the concept of a Predominant Risk Event (PRE). This is the climate related risk that we are trying to address and can include things like road flooding, undermining of a road/bridge, failure of a retaining wall etc.

For each PRE, the expected benefits of the scheme, if progressed, are based on the negative impacts that have occurred during past events.

For example, consider a fictional road flooding event which resulted in the following impacts:

- an injury to a member of the public who tripped on a partially submerged footpath;
- environmental damage to a special area of conservation which is adjacent to the roadway;
- financial costs to the Local Authority in providing pumps or sandbags, and in clean-up operations after the flooding had subsided;

- fuel and time costs to motorists who had to use a long diversion for a number of days;
- reputational damage to the Local Authority.

If a scheme is put in place to prevent this flooding recurring in the future, all of these negative impacts will be avoided, and this represents the benefits that would be produced by the scheme.

The monetary value of all these expected benefits is combined with how often the risk has occurred in the past to produce an estimate of the average benefit each year in the future. This is then compared with the scheme cost over the expected lifespan of the scheme and the ratio between these two figures is the Benefit to Cost Ratio.

Data Input

Where Local Authorities have identified potential climate adaptation schemes of the type described in the annual circular from the Department of Transport, information relating to these schemes should be submitted using the spreadsheet template provided with the circular.

This spreadsheet contains locked cells, drop down lists, data validation rules and warning messages in order to help the Local Authority provide the correct information in the format required.

If the information is not provided in the format required, this will lead to difficulties in the prioritisation process which will require the information to be queried and corrected which will lead to delays.

For this reason, it is important to always use the latest version of the spreadsheet provided with the circular rather than any previous version or any unlocked version of the spreadsheet from earlier years.

The Data Input file contains 12 tabs:

- Guidance Notes
- Data Input MD 1
- Data Input MD 2
- Data Input MD 3
- MD 4
- MD 5
- MD 6
- MD 7
- MD 8
- MD 9
- Summary Sheet
- Revision History

'Guidance Notes' tab

This tab contains a short explanation of the purpose of the workbook and of the cost-benefit approach being used. It also describes how the validation measures work and the different fields in each tab, what they mean, and how to fill them in.

'Data Input MD 1' tab

This tab is where the Municipal District (MD) should provide the information about each scheme for which funding is being sought. Each Municipal District should provide scheme details for their respective areas separately on tabs 'Data Input MD 1', 'Data Input MD 2', 'Data Input MD 3', etc.

The first line in the sheet is already populated with an example of the typical information to be provided and this is shown in red text.

The Municipal District should complete one full line of information for each scheme by populating each of the fields as described in the table below.

Note that in general, questions about how often a risk will occur or what impact a risk will have are retrospective. This is intentional as it is more objective to base estimates of the expected benefits that a scheme might deliver on what has actually occurred in the past rather than on what might occur in the future.

Field Name	Description	Validation
MD Priority	<p>This field should be used by the Municipal District to give their opinion as to the priority of the schemes being submitted. The most urgent scheme should be assigned a value of 1 in this field, the next most urgent scheme should be assigned a value of 2 in this field etc.</p> <p>Each scheme should have a unique priority value; the same priority value should not be assigned to more than one scheme.</p>	<p>Select from the drop-down list.</p> <p>If more than one scheme has been assigned the same priority value, those cells are highlighted in red.</p>
Local Authority	This is the name of the Local Authority which is applying for funding for the scheme.	Select from the drop-down list.
Municipal District	This is the name of the Municipal District in which the scheme is located.	This is a free text field – there is no data validation.
Scheme Title	This is a short title of the proposed scheme for which funding is sought.	This is a free text field – there is no data validation.
Scheme Description	This is a short description of the works which are proposed under the scheme.	This is a free text field – there is no data validation.
Road Number	This is the road number on which the proposed scheme is located in the format ‘R123’ or ‘L1234’.	This is a free text field – there is no data validation.
Start point Easting (ITM)	This is the Easting of the start point of the proposed scheme in ITM e.g. 572991.	This must be a whole number greater than 410,000 and less than 769,000.
Start point Northing (ITM)	This is the Northing of the start point of the proposed scheme in ITM e.g. 572048.	This must be a whole number greater than 504,000 and less than 966,000.
End point Easting (ITM)	This is the Easting of the end point of the proposed scheme in ITM e.g. 572991.	This must be a whole number greater than 410,000 and less than 769,000.
End point Northing (ITM)	This is the Northing of the end point of the proposed scheme in ITM e.g. 572048.	This must be a whole number greater than 504,000 and less than 966,000.

Field Name	Description	Validation
Predominant Risk Event (PRE)	<p>This refers to the main risk event that the scheme aims to address, for example Road Flooding. In some cases, there may be more than one risk event, for example road flooding could also lead to a road being undermined. In these cases, please just select the main risk event as the PRE. i.e. the risk which occurred initially and which has led to the others; or the risk which is most serious in terms of the impacts that it might generate if it were to occur.</p> <p>If none of the available options describe the risk event, enter 'Other' but please specify whether the risk is catastrophic (i.e. likely to occur suddenly such as a retaining wall collapse) or not catastrophic (i.e. likely to occur slowly such as flooding), and please give a brief description of the risk event in the Comments column at the end of the sheet.</p>	Select from the drop-down list.
Cause of the PRE	Please describe the cause of the Predominant Risk Event in this field. For example, if flooding is the PRE, the cause could be inadequate drainage, inadequate dredging of a riverbed, or the presence of an adjacent wetland area.	This is a free text field – there is no data validation.
Scheme Cost	<p>Scheme Cost: This is the estimated cost required to provide a long-term solution to prevent recurrence of the PRE (including VAT). This should not include any other works which are not necessary to address the PRE. The total funding application for each County Council should not exceed its Supplementary Restoration Maintenance allocation amount for the current year.</p> <p>Individual schemes within this total should not exceed €200,000 unless agreed with your Engineering Inspector.</p> <p>Schemes that address larger impacts with lower funding will be given preference.</p>	This must be a Euro amount between €0 and €200,000.
Scheme Cost for the current year	<p>The Scheme Cost above should be apportioned into the year(s) in which it is expected to be used.</p> <p>This field is the portion of the Scheme Cost which is expected to be completed and claimed by the end of November 2023.</p>	This must be a Euro amount between €0 and €200,000.
Scheme Cost for the following year	<p>This field is the portion of the scheme cost which is expected to be completed and claimed between the end of November 2023 and end of November 2024.</p> <p>Any cost projections in this field are for indicative purposes only. It is accepted that the actual expenditure in the following year might change and therefore the actual values for these can be provided in the following year's funding application in due course.</p>	This must be a Euro amount between €0 and €200,000.

Field Name	Description	Validation
Frequency of Occurrence of the PRE	This refers to how frequently the PRE has occurred in the past 5 years.	Select from the drop-down list.
Safety Impact	<p>This field captures PREs which have led to an injury in the past. This includes injuries to any person, including members of the public and employees of the Local Authority.</p> <p>'Yes' should be selected for this field if there has been any injury due to any previous occurrence of this PRE over the last 5 years.</p>	Select Yes or No from the drop-down list.
Environmental Impact	'Yes' should be selected for this field if the proposed scheme is located within the zone of influence of any environmentally sensitive area such as an SAC, SPA, etc.	Select Yes or No from the drop-down list.
Financial Impact	<p>This is the direct cost to the Local Authority of dealing with the PRE the last time that it occurred (if it has occurred more than once in the past, please provide the cost of the most recent occurrence only).</p> <p>For example, where the PRE is road flooding, this could include the cost of setting up traffic management, providing pumps, removing silt deposited on the road by the flooding, setting up a traffic diversion, emergency repairs to the asset etc.</p> <p>In cases where the PRE has not previously occurred, the cost range selected here can be based on an estimate of the financial impacts <u>but if the PRE has occurred in the past, the cost range selected here should be based on the actual costs incurred.</u></p>	Select from the drop-down list.
Diversion Length	<p>If a diversion was required the last time that the PRE occurred, please provide the <u>additional travel length</u> that was required by that diversion in kilometres.</p> <p>In cases where the PRE has not previously occurred, please provide an estimate of the additional travel length of the diversion that would be required if the PRE were to occur.</p>	Select from the drop-down list.
Diversion Duration	<p>Enter the number of days that the traffic diversion was required the last time that this PRE occurred.</p> <p>If the PRE has never occurred in the past, please provide the anticipated duration of diversion that would be required if the PRE were to occur.</p>	Select from the drop-down list.
Road Type	This is the category of road that was closed (if any) during the last time that the PRE occurred.	Select from the drop-down list.

Field Name	Description	Validation
Verified AADT ¹	<p>This is the AADT <u>that would be impacted</u> by a road closure if the PRE were to occur. For example, this would be the full AADT if the road was fully closed but would be 50% of the AADT if the road was closed in one direction only.</p> <p><u>This field should only be filled out where the AADT is known with certainty e.g. from a recent traffic survey. Otherwise, leave this field blank.</u></p>	This must be a whole number greater than 10 and less than 20,000.
Estimated AADT	<p>As above, this is the AADT that would be impacted by a road closure if the PRE were to occur.</p> <p>If a Verified AADT has been provided in the previous column, this column should be left blank. But if a Verified AADT is not provided, please provide an estimated AADT value here.</p>	This must be a whole number greater than 10 and less than 20,000.
Bus Route	Enter 'Yes' in this field if there is a bus route at the scheme location which was closed the last time that the PRE occurred. If there is no bus route at the location, or if there is a bus route but it was not closed due to the last occurrence of the PRE, enter 'No' in this field.	Select Yes or No from the drop-down list.
Cycle / Pedestrian Route	<p>Enter 'Yes' in this field if there is a cycle track / footpath at the scheme location which was closed the last time that the PRE occurred.</p> <p>If there is no cycle track / footpath at the location, or if there is a cycle track / footpath but it was not closed due to the last occurrence of the PRE, enter 'No' in this field.</p>	Select Yes or No from the drop-down list.
Householders Relocated	Enter 'Yes' in this field only if one or more householders were relocated from their home for one night or more due to the last occurrence of the PRE. Otherwise, enter 'No' in this field.	Select Yes or No from the drop-down list.
Critical Infrastructure Route	Enter 'Yes' in this field if the PRE will result in the temporary closure of a Critical Infrastructure Route ² (i.e. a route to a strategic facility such as a hospital, fire station, power station or port etc). Otherwise, enter 'No' in this field.	Select Yes or No from the drop-down list.
Reputational Damage due to the PRE	Enter 'Yes' in this field if this PRE is an issue which has been the subject of complaints from the public and/or representation from Elected Members in the past. Otherwise, enter 'No' in this field.	Select Yes or No from the drop-down list.
Comments	This field may be used to provide any additional relevant information about the scheme.	This is a free text field – there is no data validation.

¹ Annual Average Daily Traffic

² Refer to *Technical Annex 2 - Critical Infrastructure Routes* for more details.

The 'Data Input MD' tabs also contain a number of checks and the purpose of these is to highlight any information which has been supplied in the correct format, but which is abnormally high or low and therefore may be an error. The user should use these warning messages to double check that the relevant information provided is correct.

Note that these warnings are only intended as a guide. In cases where a particular scheme is unusual in some way, it is possible for a warning message to be displayed even when the correct information has been provided.

If '**Warning 1**' is displayed: This means that the start and end points provided for the scheme are more than 100m apart. This is unusual and may indicate that incorrect coordinates have been entered. The user should double check the coordinates provided.

If '**Warning 2**' is displayed: This means that the start and end points provided for the scheme are more than 1km apart. This is very unusual and probably means that incorrect coordinates have been entered. The user should double check the coordinates provided.

If '**Warning 3**' is displayed: This means that the value entered for AADT is abnormally low for the type of road selected. The user should double check both the road type and the AADT provided.

If '**Warning 4**' is displayed: This means that the value entered for AADT is abnormally high for the type of road selected. The user should double check both the road type and the AADT provided.

If '**Warning 5**' is displayed: This means that the Scheme Cost provided is not equal to the sum of the Scheme Cost for the current year + the Scheme Cost for the following year.

'Revision History' tab

This tab shows the version of the Data Input spreadsheet and the history of changes to the file.

Summarising the Schemes

Once each MD has provided all of the scheme information on the 'Data Input MD' tabs, the Local Authority shall compile their preferred projects for the County into the single 'Summary Sheet' tab where each scheme will need to be checked and prioritised.

This should be done by copying / pasting the information from each 'Data Input MD' tab into the relevant columns of the 'Summary Sheet' tab in order to produce a single list of the climate adaptation projects for the County. There should be no gaps in the 'Summary Sheet'.

The total cost of projects in the 'Summary Sheet' shall not exceed the Supplementary Restoration Maintenance allocation for the County for the current year.

Once this has been completed, the Local Authority will need to check that the data for each scheme is correct.

In order to assist with the process of checking the scheme data, a number of features have been included in the 'Summary Sheet' to help identify errors.

The Message field will show as 'Invalid' for any schemes which contain an error.

LA Priority	Message
	Invalid

In addition to this, the columns at the right of the scheme data will identify the specific data entry(ies) that is/are causing the error.

Local Authority	Predominant Risk Event (PRE)	Scheme Cost	Scheme Cost Split
✘ 0	✘ 0	✔ 1	✔ 1
✘ 0	✘ 0	✔ 1	✔ 1

The Local Authority should correct any data errors as described above as the cost benefit analysis process cannot be completed for schemes with erroneous data.

The Local Authority can then assign a priority to their list in the ‘Summary Sheet’. Schemes which are most urgent should be assigned a value of 1 in the LA Priority column, the second most urgent scheme should be assigned a value of 2, and so on for all the schemes to be submitted. The Local Authority may take account of the MD Priority values when doing this, but the LA Priority column must be used to prioritise all schemes across the Local Authority as a whole and therefore these will be different to the MD Priority values.

Note that it is not possible to assign a priority rating for invalid schemes, scheme data will need to be correct before a LA Priority rating can be assigned.

Also, the same priority rating should not be applied to more than one scheme. If this happens, the cell will turn red to indicate the error.

LA Priority	Message	Project Code
1	Valid	C2/CCAR/22/001
	Invalid	C2/CCAR/22/002
	Invalid	C2/CCAR/22/003
2	Valid	C2/CCAR/22/004
3	Valid	C2/CCAR/22/005
4	Valid	C2/CCAR/22/006
	Invalid	C2/CCAR/22/007
4	Valid	C2/CCAR/22/008

Auditing

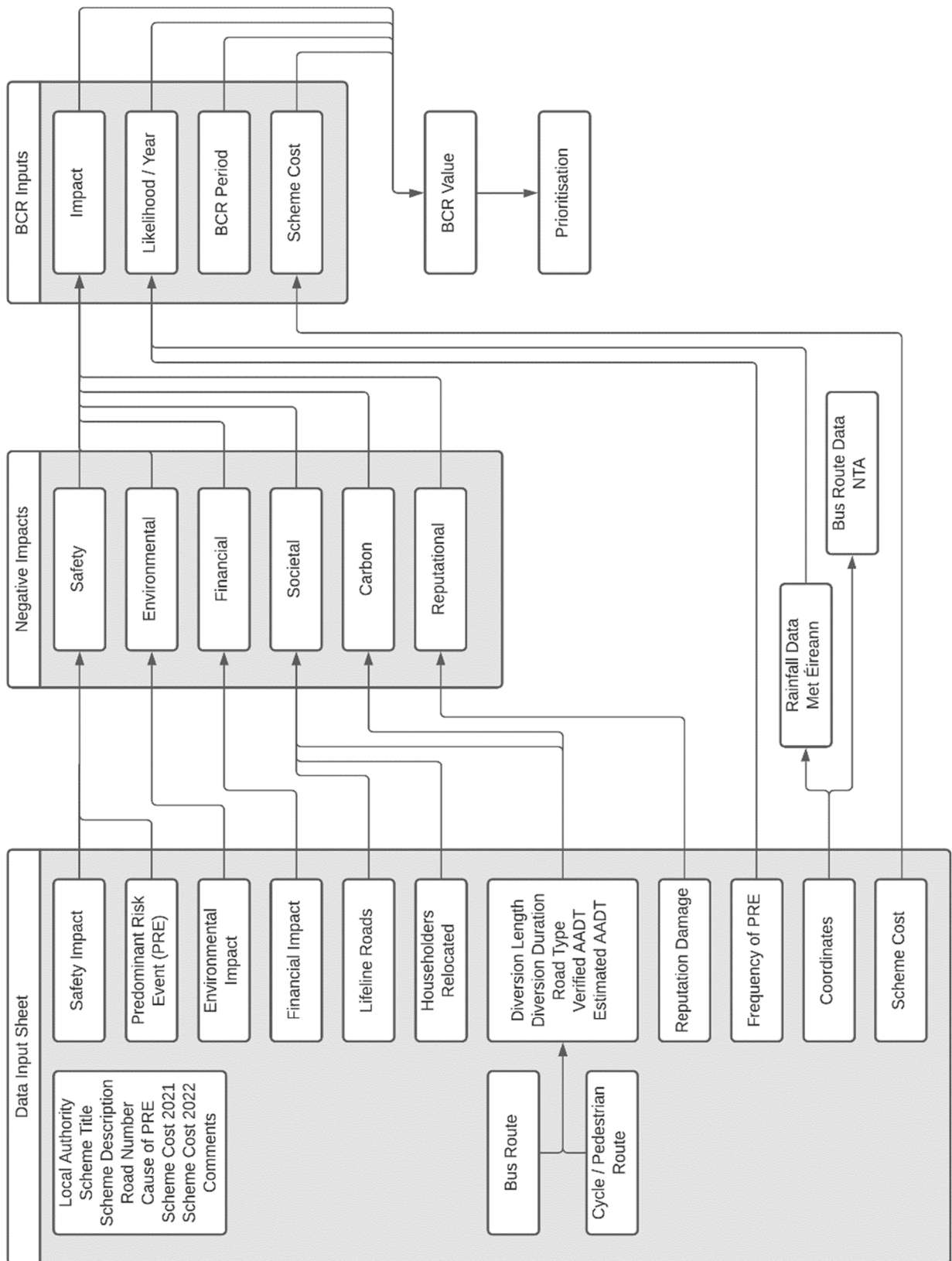
Once the information above has been collated and submitted, the Department of Transport will compile the data from all Local Authorities, assign initial BCR values and undertake an audit to check for errors.

This audit will be based on the following 3-step process.

- A random sample of all the schemes submitted will be selected and these will be checked in detail to verify the accuracy of the information provided.
- Schemes which are close to the funding threshold will also be checked in detail as it is these schemes which are most likely to be impacted by a small error in the estimated BCR value assigned.
- Schemes which have been assigned unusually high or low BCR values when compared with the spread of values across the entire dataset will also be checked in detail, as this can be an indication of an error in the data provided for those schemes.

As a result of this process, it may be necessary for the Department of Transport to contact relevant Local Authorities from time to time for additional information or clarification of the original information provided.

Appendix A - Process Flow Diagram





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