Impacts of Climate Change on Urban Infrastructure & the Built Environment

A Toolbox

Tool 4.6: Overview of the Top-Down Decision Tool

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1. Introduction

1.1 Background

This document gives details of one of a number of tools developed to assist Councils, and others, in taking account of long-term climate change effects in their on-going management of the urban environment, with the aim of making the built environment more resilient to climate change effects.

The tool described here [Tool 4.6] is included within a Toolbox Framework of various reference and guidance documents and software tools designed to assist in assessing risks and development responses in a way that will reduce risks and lead to more resilient urban areas in the face of climate changes which include increasingly extreme weather events.

The top-down decision tool encapsulates the complex decision-making processes that local authorities undertake whenever a development is proposed. Such processes apply, regardless of whether the development is a public or private development, an element of infrastructure or a new building for private or public use. It equally applies to new development areas including planned "greenfield" urban extensions and "brownfield" redevelopment.

The use of the tool is illustrated by an example of a typical redevelopment and urban intensification project on a steep hillside. In such circumstances the increasing risk of high-rainfall events associated with climate change in the environment is a relevant consideration. The example refers to the decision context, including the situation where the community has expressed a range of aims through its planning documents.

1.2 Purpose of Tool

This tool sets out in a relatively straight-forward way, the types of considerations that all local government must apply in a regulatory role when faced with any development that will modify the urban environment. The regulatory responsibilities derive from a range of legislation, including the Local Government Act 2002 (LGA), the Resource Management Act 1991 (RMA), and the Building Act 2004 (BA). Councils have a range of powers and responsibilities, including regulatory powers and responsibilities, under these legislative instruments. Many of these responsibilities are given effect to through subservient regulatory instruments such as regional and district plans, codes and bylaws, which are developed largely or in part by the regional or district community, and thus are tailored to the specific circumstances of the region or district. While some of the instruments are simple and set minimum standards and requirements, others are complex and seek to achieve a range of simultaneous outcomes. In such circumstances, decision-making becomes a complex issue.

This tool aims to set out and discuss simple steps towards sound decision-making. Other instruments described in this Toolbox, such as Cost-Benefit Analysis (CBA) [see Tools 4.3 and 4.4] and Multi-Criteria Analysis (MCA) [see Tool 4.5], can contribute to the top-down decision-making method described in this tool although usually these techniques would be used at an earlier stage of project development when there are a range of options being considered.

2. Overview of the Top-Down Decision Tool

The decision tool described here as the Top-down Decision Tool is a codification and explanation of the type of decision-making that Councils undertake every day under a range of statutes.

2.1 Basis of the Decision Tool

Councils are charged with decision-making under a range of statutory mandates. These have evolved over a long period, and Councils may be liable for decisions that are not properly made or which do not take into account all relevant matters.

Sometimes the decisions relate to their own works and projects, undertaken at a community's cost and for the community's benefit (for example a flood protection scheme, or a district plan change to enable a new urban growth area). In such circumstances, a range of other decision tools, such as CBA and/or MCA may already have been applied[1] and the "top-down" decision may take into account those evaluations.

More commonly, the decision will result from a project or proposal generated in the private sector, involving private land and private finance. The statutory intervention provided for in the various legislation is based on community considerations that transcend individual interests, such as long-term sustainability, the need for community resilience in the face of natural hazards, and the development of an overall urban environment that meets human needs of health, safety and general well-being. Decisions are usually made in a context that acknowledges a time dimension and the needs of future generations. For example, the expected life of major infrastructure may exceed a century, while individual buildings may have a life of 50 to 100 years.

The various statutes set out some specific considerations for decision-makers, and may include a framework of requirements in terms of processes to be undertaken, form of decision and timeframes. However, no statute or regulatory instrument actually says how a decision must be made.

[1] The Section 32 analysis, which must be undertaken for plan development and plan changes under the Resource Management Act, can be regarded as a simplistic form of CBA.

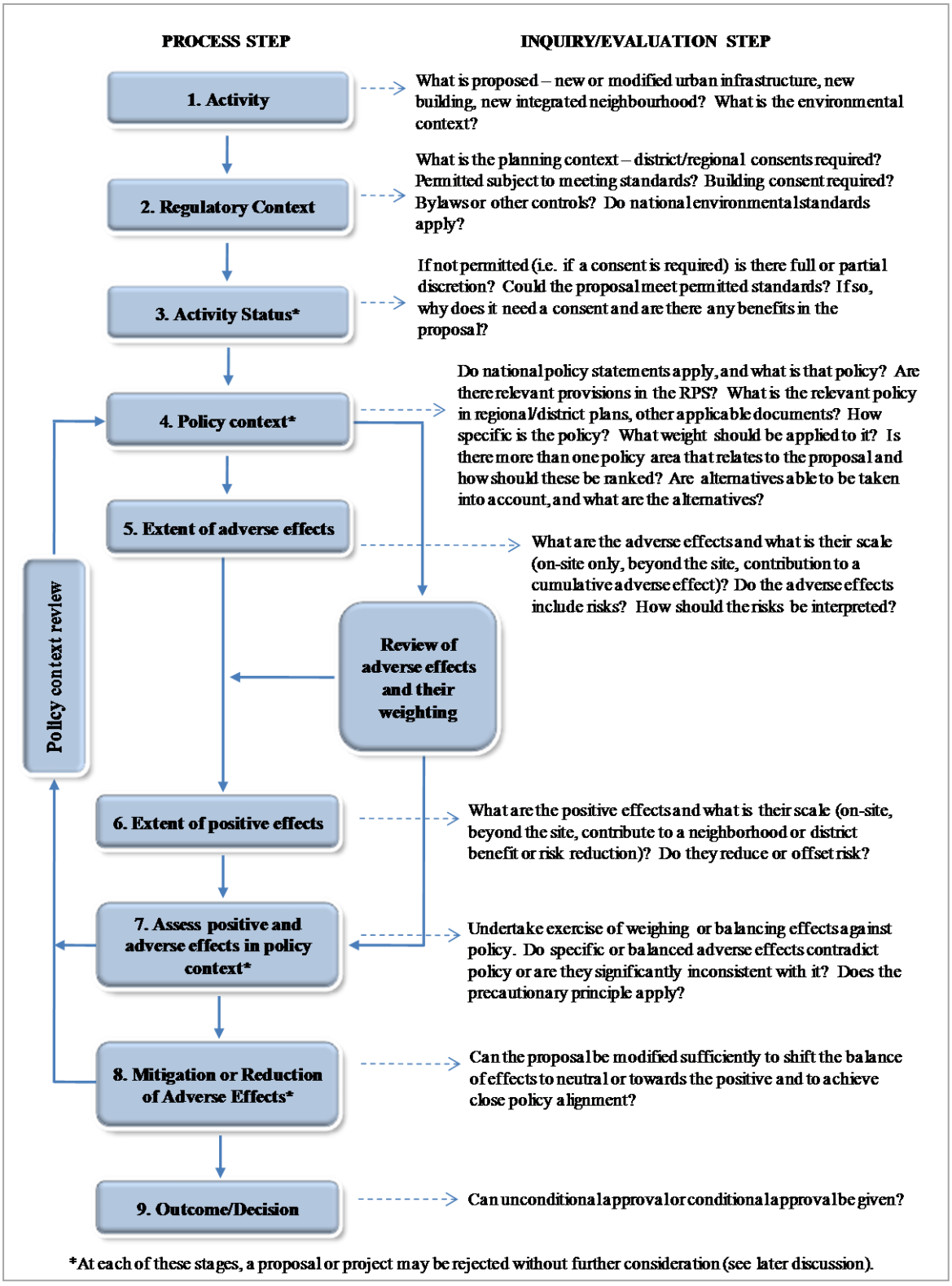

Figure 2.1: The Top-down Decision Tool

Figure 2.1 sets out a generic framework, indicating the steps in the application of the Top-down Decision Tool. The associated notes set out the types of evaluations that need to be made.

The Tool is expressed as being "top-down", as the framework for the decision and most of the considerations are "givens". A proposal, project or work is introduced into the framework at the top of the process and works its way through the process steps with various inquiries or evaluations being made by the decision-makers as the process proceeds towards the ultimate decision.

The process shown in the diagram primarily relates to Resource Management Act approvals, including plan changes that provide for specific development, designations for public works and network utility developments, as well as for buildings, other structures and landuses. However, a similar, although simpler process applies to Building Act approvals and policy and projects developed under the Local Government Act. Building Act approvals often follow on from Resource Management Act approvals and may need to give effect to specific conditions applied to a development, or the interpretation of the Building Code may need to be checked and confirmed through Building Act certification processes.

2.2 Data Needs

For decisions under the Top-down decision process, adequate information must be available for the decision-maker to understand the implications of what is proposed in terms of the decision to be made. Thus complex projects which involve multiple effects and may have multiple consequences (such as potential for building collapse of occupied buildings under a landslide or flood event) will need to provide more detail, potentially over a range of specialist aspects (for example, details about the soils and underlying geology as well as structural design and materials). Where climate change may be relevant to future effects, information taken into account by the project's proponent and any assumptions made about such effects, should be provided as part of the information.

Usually the decision-maker has powers and responsibilities relating to adequacy of data as an early step in the Top-down decision process. Further information can usually be sought from the person initiating the proposal, project or work, and there are usually opportunities for the decision-maker to obtain an independent peer review.

2.3 Decision Outputs

The Top-down Decision Tool results in an approval or consent to undertake a development, or to modify part of an urban environment for future use and development (for example, by a plan change to provide for a new suburb or neighbourhood, or for the intensification of an existing urban area).

The decision should be framed in a way that ties it back to the proposal and the associated information, and that applies any conditional elements (such as minimum floor levels, or requirements to undertake construction to meet specified standards or to be carried out in specific ways).

2.4 Assumptions and Limitations

There are inherent assumptions in the use of this decision tool that the information supplied, and the decision-maker's understanding of the implications of what is proposed, are adequate, and that the process of inquiry or investigation will lead to a rational, justifiable outcome.

One of the more problematical aspects of Top-down decision-making is that of integrating policy evaluations into the overall process. This is particularly the case where there are multiple policies, and where these are vague, conflicting or not prioritised. This aspect is discussed later in the context of the example.

In the context of climate change there are a number of complications in applying the Top-Down Decision Tool. For decisions to be able to take into account climate change aspects, climate change must be identified as a matter that is relevant to the decision to be made either through a rule or standard, or through a policy, or it must be related to a relevant effect of the proposal or project.

While rules or standards may provide specific limits or requirements, leaving no room for interpretation, in other circumstances the rules or standards may set minimum standards or provide basic thresholds, leaving decision-makers with the flexibility to determine the likely extent of an effect, and an appropriate response. Similarly, policy provisions may be couched in general terms, leaving the decision-maker to interpret the policy intention.

In such circumstances, it is important that the decision-maker has a basic understanding of climate science and the likely impacts arising from a range of projections or scenarios, interpreted in the location and at the level relevant to the decision.

National guidance is available from a range of sources, and decision-makers need to ensure they seek relevant current information at the time of making the decision. Case law may also provide relevant guidance in some circumstances.

Local authority plans and policies may require regular review to ensure that they remain abreast of climate change information and issues for the region, city or district. The Plan Audit Tool [Tool 1.5A] explains and gives an example of appropriate methodology for a review

3. How to Apply the Selected Top-Down Decision Tool

Top-down decision-making may be applied in the following situations:

- by a formal hearing committee or panel, specifically constituted by a Council to hear a resource consent application or private plan change.

- by a sole hearing commissioner appointed to hear a resource consent application or private plan change.

- by one or more Council officers acting under delegated authority on behalf of a Council, exercising authority under the Resource Management Act or Building +Act.

Larger and more significant developments are more likely to trigger formal processes under the Resource Management Act as in the first two situations above, and the processes involve public input and a range of process rights. Smaller developments, and all Building Act consent matters, are dealt with under the third situation.

Councils are usually aware of potential lack of transparency and conflicts of interest in formal decision processes relating to their own developments (such as works relating to drainage schemes and other public works). In such circumstances the Top-down decision methodology will be applied by independent hearing commissioners.

Top-down decision processes involve relatively formalised steps. However the application of consideration of climate change effects within the ambit of the methodology is not yet well-established. The concepts below are relevant to the decision processes under the Resource Management Act.

"The effects of climate change" is a matter to which particular regard must be had under Section 7 of the Resource Management Act, when making a decision on any resource consent application.

An *"effect"* as described in Section 3 of the Act includes:

" a) any positive or adverse effect; and
b) any temporary or permanent effect; and
c) any past, present or future effect; and
d) any cumulative effect which arises over time or in combination with other effects
– regardless of the scale, intensity, duration, or frequency of the effect, and also includes –
e) any potential effect of high probability; and
f) any potential effect of low probability which has a high potential impact."

Section 104 of the same Act, which is the key decision-making section, sets out a requirement to have regard to *"actual and potential effects on the environment"*, meaning that consideration of future effects is not limited to only (e) and (f) above.

The *"environment"* as described in Section 2 of the Resource Management Act includes:

" a) ecosystems and their constituent parts, including people and communities; and
b) all natural and physical resources; and
c) amenity values; and
d) the social, economic, aesthetic, and cultural conditions which affect the matters stated in paragraphs (a) to (c) of this definition or which are affected by those matters."

The concepts above apply to plan changes under the Resource Management Act as well as to applications for consents for specific developments. Plan changes usually apply to larger areas and involve additional considerations, such as those under section 32 of efficiency and effectiveness.

The Building Act provides a more codified approach through the Building Code. However, key considerations addressed, such as stormwater and flood exposure of structures, relies on local interpretation and an understanding of risk, including risk elements that may change within the life of the structures.

3.1 Application Framework

The application framework for the Top-down Decision Tool is set out in Figure 2.1. Steps in the tool may have to be modified by the user, depending on the legislative framework and the scope of the decision to be made.

3.2 Tool Structure and Content

This section works through the process steps in Figure 2.1, adding information and discussion relating to the Inquiry/Evaluation Notes in the diagram. Later sections of the report apply the steps to a specific example of development on a steep hillside in a Wellington residential suburb with particular consideration of instability (landslide and erosion) relating to future rainfall events under a changing climate.

Step 1, Activity

What is proposed? It is important to have a good understanding of the scope and detail of the proposal. In particular, questions need to be asked about staging, including whether the present proposal will have later consequences – e.g. is it the first stage of a future development, such as in the example referred to later, or is it a complete proposal where subsequent approvals may relate only to building consent matters? Is it an element of infrastructure which may require staging or future enhancement?

It is also appropriate to enquire into the site and immediate and wider locality – are there particular contextual characteristics which take the application out of the norm

such as its scale or potential effects on people and development nearby? Does the locality include particular risks, for example risk of flooding or land instability, or land contamination[2].

Step 2, Regulatory Context

No proposed activity or development exists in a vacuum. A range of national, regional and district advisory and regulatory requirements apply. In particular, the district plan contains provisions regulating the use and development of land, including subdivision, earthworks and all buildings. The provisions may vary across city or district; or may be consistent. District plans may include minimum or maximum requirements as to other aspects such as impermeable surface coverage or clearance of vegetation on slopes. In addition, regional plans may regulate earthworks and site development that may affect natural drainage patterns (such as piping, culverting or covering of water-courses). There may be relevant natural environmental standards that must be met[3]. Councils may also have bylaws, such as earthwork or construction bylaws.

For any proposal, it is important for the decision-maker to have a good understanding of the range of regulatory instruments that may apply. If multiple consents are involved, a proposal may be considered jointly by several agencies or separately by the different agencies.

The "bottom line" in regulation of land use and development tends to be approvals under the Building Act. Even if a development does not require resource consents or other approvals, a building consent is required for anything involving a structure, from a retaining wall to a building. Building consents are handled by territorial local authorities.

Both the Resource Management Act and the Building Act generally provide for ongoing maintenance and replacement of structures and activities. There are limited circumstances in which the presumption of automatic replacement of a structure does not apply. In areas that are known to be flood-prone or subject to natural hazards that are likely to worsen, the decision-maker may have little power. Councils need to be alert to such circumstances and decision-makers or advisors should raise such circumstances with Councils when they identify worsening or potentially cumulative effects relating to natural hazards from climate change. This may lead to an audit of the appropriateness of the policy, and possibly a subsequent policy review.

[2] This information may be available on the Council's files (regional and/or district) and should have been sought by the applicant through a Land Information Memorandum.
[3] Where these rarely directly affect land uses and developments, there is an increasing range of environmental standards at national level, and it is important that these are not overlooked.

Step 3, Activity Status

Determining the activity status of a development or land use change will determine the process that its evaluation will follow and the range of considerations that are brought into play. The activity status is most likely to be determined by the location of the proposal (the zone it is within) and the details of what is proposed.

In some areas, particular developments, or any development at all, may be prohibited. Examples could be flood pathways or areas of high instability such as deep-seated mudflow areas. For these areas and/or some specific types of activities, resource consent applications may not be made and it follows that building consents cannot be granted. Thus Step 3 of the Top-down Decision Tool shows that a proposal may be rejected at the stage of determining its activity status. This applies only to prohibited activities or developments.

Table 3.1 sets out the types of activity status that a proposal may fall into in terms of the Resource Management Act.

Table 3.1 Range and Types of Activity Status under the Resource Management Act

Activity status	Applies to	What aspects can be considered?
Permitted Activity	Uses and developments that the plan permits, or does not fall into any of the categories below.	None – no resource consent is required (although a building consent may be needed).
Controlled	Uses and developments that are described as controlled activities in the plan.	The range of matters set out in the plan for the particular controlled use. Controlled uses cannot be refused consent, but conditions that relate to the matters of control can be attached to the consent.
Discretionary (Restricted)	Uses and developments that are described as discretionary in the plan, but where the discretion is limited to stated matters.	The range of matters set out in the plan for the particular discretionary activity, including any associated effects and any particularly relevant objectives and policies. Consent may be granted, declined or granted subject to conditions that relate to the aspects where discretion has been retained.
Discretionary (Unrestricted)	Uses and developments that are described as discretionary in the plan, and where discretion has not been	Any effects of the activity, and how it aligns with the objectives and policy in the plan and the purpose of sustainable management set out in the Resource Management Act. Consent may be granted, declined, or

	limited.	granted subject to conditions on any aspect of the activity.
Non-complying	Uses and developments that trigger a rule in a plan that makes them non-complying.	Whether the activity is contrary to the objectives and policy in the plan, the purpose of sustainable management set out in the Resource Management Act, and the effects of the activity. Consent may be granted, declined, or granted subject to conditions on any aspect of the activity.
Notice of Requirement for a Designation	Projects of Councils, the Crown or the activities of utilities and network utilities approved by the Minister.	Any effects of the activity, and how it aligns with the objectives and policy in the plan and the purpose of sustainable management set out in the Resource Management Act. Alternative sites, routes and methods and whether the proposal is reasonably necessary. The requirement may be confirmed, modified and/or made subject to conditions.
Plan Change (Council-instituted or private plan change)	Large proposals which go beyond the current district or regional plan (e.g. a new suburb or major intensification proposal)	All aspects of the proposal, including how it fits in with the stated policy of the plan and the sustainable management purpose of the Resource Management Act itself. The nature and extent of effects. What limitations and conditions should apply. How the proposal integrates with and affects other areas. A plan change may be adopted as part of the plan with or without modifications, following a public process.

As well as the activity status, which is determined by reference to the district and/or regional plan, there may be national environmental standards which the activity must meet[4].

There may be local authority bylaws or codes of practice which are also relevant to landuses and developments. Usually these must be met on an ongoing basis – for example trade waste bylaws or bylaws to avoid pollution of water sources, and codes of practice for land development.

[4] As at April 2011, the only national environmental standards relate to air quality, drinking water sources, telecommunications facilities and electricity transmission. However, additional standards, including standards relating to future sea level rise, soil contaminants, plantation forestry, and ecological flows and water levels in rivers and streams are in preparation.

Permitted activities, as explained above, do not require resource consents and proceed on the basis of building consents only. If a resource consent has been obtained, there will be a range of conditions to be met, including conditions which may relate to subsequent building approval processes, or which might relate to site preparation prior to granting a building consent.

The Building Act, and the Building Code which provides detailed methods of control by statutory regulation under that Act, involves approvals which are administered by territorial local authorities. They set specific functional and performance criteria which must be met and certified by a council. Where meeting the criteria allows for both standard and innovative responses (achieved by direct verification under compliance documents, or through alternative acceptable solutions negotiated with the council), council decision-makers have very little flexibility to depart from standards specified in the Building Code[5]. There may, however be discussion and debate around the local and/or site-specific interpretation of the event for which a standard is set (such as the height of the AEP flood – which, with climate change, may increase over time). The adequacy of information accompanying an application may be an issue in such cases, and councils may request further information. In addition, councils have additional responsibilities under the Building Act relating to natural hazards[6].

Step 4, Policy Context

Once it is determined that a resource consent is needed for an activity or project, it is very important to gain an understanding of the objectives and policies in the planning documents that may apply to the proposal.

The relevant policy documents for any proposal are hierarchical and the "lowest" document in the hierarchy can be expected to have the most detailed policies. Instruments such as national policy statements (for example, the New Zealand Coastal Policy Statement) and regional policy statements are required to be given effect to by district and regional plans[7], so it can be expected that more detailed locally-focussed

[5] Section 18 of the Building Act provides that building work is not required to achieve performance standards additional to, or more prescriptive than, the Code provides for. However, this is subject to any express provision to the contrary in any Act. It is also subject to a provision under section 37 that if a resource consent is required, no or only specified work can take place until the consent is obtained. An example where a departure may be required is in relation to the effects of site surface water management on other property. The Code provides that the standard protection relating to a 10 year AEP surface water event may be varied through the Resource Management Act (i.e. through a district or regional plan). This minimum requirement may be relaxed or increased by a rule in a plan, whether over the whole district or part of a district.

[6] Sections 71 to 74 set in place a procedure where a council recognises that a building work is on land subject to natural hazards and the work will worsen or result in a natural hazard on that land or other property. The sections referred to allow for refusal of a building consent, or approval subject to notation on a certificate of title.

[7] Section 67(3) of the Resource Management Act in relation to regional plans, and section 75(3) in relation to district plans.

policy would be found in these plans relating to matters that are addressed in regional and national policy statements.

For matters that relate to natural hazards, section 62(1)(i) of the Resource Management Act requires that the regional policy statement must state which local authority (i.e. city/district council or regional council) is responsible for specifying objectives, policies and methods (including rules) to control the use and development of land to avoid or mitigate natural hazards or any groups of natural hazards, in any part of the region. If the regional policy statement doesn't address the matter of responsibilities, responsibility for controlling land uses and developments in relation to natural hazards remains with the regional council (section 62(2)).

Because of this complexity, it will be important to review objectives and policies in the regional policy statement whenever an activity has potential natural hazard issues in the short or longer term, and is discretionary or non-complying in terms of a regional or district plan, or where a plan change is involved.

Objectives and policies will indicate the importance of the issues and considerations, and help determine the weighting that should be given to specific effects. For example, if an objective or policy seeks to "avoid" specific outcomes (for example, to avoid the actual and potential adverse effects of natural hazards on use and development of land in a particular area), any such effect will be taken very seriously. It is possible that risk exposure, such as hazards, may be sufficient to cause an application to be declined. If the risk of an effect is not necessarily to be avoided, but rather may be mitigated, consent may be granted subject to conditions. As strongly stated objective or policy in a plan will be significant in informing the eventual decision to grant or decline consent.

Note that the Top-down Decision Tool includes iterative considerations between Step 4 and Step 8, in which evaluation of the extent of adverse and beneficial effects, including consideration of the effects in relation to stated objectives and policies, takes place.

Once relevant policies have been identified and carefully interpreted, the process can move on to consider effects.

All decisions on applications under the Resource Management Act are made "subject to Part 2" of the Act. Sections 5 and 6 include matters of national importance and other matters to which particular regard must be had, including the effects of climate change. These can be seen as high-level policy prompts. Part 2 matters are also very influential in the development of regional and district plans and plan changes.

Step 5, Extent of Adverse Effects

Most proposals for developments or activities have a range of associated adverse and beneficial effects. When adverse effects are being considered, there are four key contextual considerations:

1. The definition of "environment" (see Box in section 3 of this report), which includes biophysical elements, the built environment, and community elements.

2. The relevant objectives and policies of a range of national, regional and local planning instruments and whether some actual and potential effects should have more weight placed on them because of an emphasis in stated policy.

3. The inclusive nature of the definition of effects (see Box in section 3 of this report), which includes actual and potential effects, elements of risk and consequence, and cumulative effects over time or as a result of any combination of several types of effects.

4. The status of the activity, identified in Step 3, which may restrict the range of effects which can be taken into account.

There are key process steps associated with a preliminary assessment of adverse effects. A resource consent application must be publicly notified if the associated effects are, or are likely to be, more than minor beyond the immediate neighbourhood. If the effects are minor, neighbours' approvals may need to be obtained or a limited notification process (limited to persons with interests in adjacent properties) will need to be undertaken to allow affected people to have their say on a proposal. If effects are considered to be less than minor or insignificant, notification is not required. However, Councils have full discretion to publicly notify an application for a proposal, including if there are special circumstances[8].

While applications are required to provide sufficient information for the decision authority to understand the effects and the implications of granting consent (with or without conditions), public notification often results in submissions which challenge

[8] The sections of the Resource Management Act that relate to notifications of applications have little case law interpretation yet. However, special circumstances are most likely to relate to potential effects and to cumulative effects, where the extent of the effect may not be clear.

an applicant's knowledge and understanding of the local environment, or the perceived extent of adverse effects. This process may add useful detailed knowledge of the local environment and actual or potential effects which otherwise may not be known. In particular, when a plan contains objectives or policies which require a precautionary approach, the long-term observational understanding that local residents can bring into the process can be very useful, as the latter case study shows.

Understanding the actual and potential effects may require a technical understanding, and often experts are involved by a Council in a review capacity[9].

When adverse effects and their likely extent has been identified, then it is important to understand a brief review of policy to determine whether particular weighting should be placed on any particular effect. For example, if there is a relevant policy to avoid the effects of natural hazards in an area, an application which carried a risk of increased natural hazards would need to be carefully considered, and if the increased risk was more than minimal consent should be granted. If the policy was to mitigate effects, a decision-maker would need to assess both the likely nature and extent of increased risk and also any particular proposals or opportunities to mitigate the risk which could become conditions of a consent.

Step 6, Extent of Positive Effects

Many decision contexts focus on limiting adverse effects and achieving at least base-line environmental, social, economic and cultural outcomes, as relevant. This is inherent in the intention of the Resource Management Act, and in the setting of minimum standards and requirements under the Building Act and through instruments such as bylaws.

However, there is a balancing process to be undertaken under Part 2 of the Resource Management Act, where positive effects can be taken into account alongside actual and potential adverse effects. Positive effects can include the outcome of the proposal – i.e. the range of such effects may include the purpose of projects such as community infrastructure developments designed specifically to provide for community needs and/or to mitigate other effects such as flooding, or developments in the private sector designed to meet social and economic needs.

The identification of positive effects is usually more straight-forward than negative effects, but as with negative effects in Step 5, depending on the context and the extent of adverse effects, additional advice may need to be obtained to determine the accuracy of claimed positive effects.

[9] These may be in-house specialists or consultant reviewers. A further ability to involve such expertise is the appointment of commissioners with technical expertise in the decision-making process. This is most likely to happen with notified applications.

Step 7, Assess Positive and Adverse Effects in Policy Context

By Step 7 a decision-maker should have a sufficient understanding of a proposal to begin to make a determination. This step involves a contextual review of information about effects and a first-step decision as to whether the proposal should be able to proceed. If the adverse effects (including risk effects) are so significant that sufficient mitigation seems unlikely to be achieved without a fundamental change to the project, then it may be rejected at this point. Similarly, if the examination of adverse effects shows significant misalignment with policy, then it may be rejected at this point. An iterative process of review of policy and effects may be required at this stage.

Otherwise, the decision-maker proceeds to Step 8.

Step 8, Mitigation or Reduction of Adverse Effects

A proposal may require no further consideration at this stage, as it incorporates sufficient mitigation to address any adverse effects. For example, if development in a flood-prone area is not ruled out by the district plan, an applicant may have identified and satisfactorily addressed flood risk through a series of provisions included in the application such as bunding, elevation of building floor levels and on-site access ways, use of materials; etc. However, even if this is the case, a decision-maker may choose to ensure that these provisions are carried through into a building consent and actual development by specifically including them as resource consent conditions.

Sometimes, however, a decision to grant consent may only be able to be reached by further detailed specification of some aspects of the proposal or by some modification to it. Both can be done by way of conditions. If adequate conditions are unable to be identified, if they would result in a major modification of the proposal, or if they render the proposal unachievable, then a decision to decline should be made at this step.

Again, it may be necessary to review policy and the nature and extent of effects in undertaking this step.

Step 9, Outcome/Decision

This step involves finalising and writing up of the decision. There are two key elements involved; writing up the decision in a way that it will stand up to subsequent scrutiny, and ensuring that any conditions are relevant, robust, enforceable and unambiguous.

Regardless of whether consent is granted or refused, there may be opportunities for an applicant or other parties to seek a review. This may be to a council committee or court[10], so the decision and the reason for it must be clear.

Conditions run with the consent, and may apply to various stages of a development. It must be made clear in the conditions themselves if some conditions are to be achieved before the substantive development can take place, and any other times for conditions to be achieved.

Resource consents are usually followed by necessary consents under the Building Act. If all resource consents have not been obtained, building consents can be issued but the certification is subject to a stay of all or part of the work until the necessary resource consent is obtained.

3.3 General Comment

As explained earlier, the Top-down Decision Tool is a process that is applied every day by decision-makers within local authorities in various circumstances and in various degrees of complexity.

The structured approach as set out in the Tool is adaptable to many circumstances, and sets out a formal, structured approach and a means of aiding decision-making.

The process tends to be information-hungry, although judgement calls need to be made about the extent of information that is reasonable in any particular circumstance.

In particular, when considering climate change effects, risks, consequences and the precautionary approach require special attention. Policy guidance should be included in plans, but as the matter is included in Part 2 of the Resource Management Act, it is relevant to all decisions under the Act.

4. Example – Wellington Hillside Development

4.1 Application of Decision Tool

This section applies the Top-down Decision Tool to an example, based on a proposed use and development of a site in one of Wellington City's eastern suburbs[11]. While not a typical situation, in that the scale of the proposal is somewhat larger than past developments, the proposal is typical of a new generation of intensified development

[10] If building consents are involved, there is opportunity (available to the applicant only) for a review by determination of the Department of Building and Housing.
[11] Details of the example have been simplified and slightly altered. However the example is largely based on the examination of Council files and discussion with Wellington City Council officers.

in an existing suburban area. In very general terms, intensification of urban areas is encouraged at national, regional and district levels as it makes efficient use of the development of land, support and community services. However, at local level, the steep nature of the terrain involves some development issues.

The example involved obtaining resource consent for subdivision and earthworks in order to facilitate later housing development. The approval enabled preliminary subdivision and site development, including provision of a shared access road for several sites and in-road services. Subsequent dwellings and subdivision of land would probably proceed without the need for resource consents, although controlled use subdivision consent could be needed. Building consents were needed for retaining walls.

This section outlines the process of applying the Top-down Decision Tool. It then discusses the outcome in practice, possible lessons learnt and the next steps that are likely to occur.

Figure 4.1: Case study site, Wellington.

Step 1: Activity

The activity for which the application was made was the subdivision[12] of a 1.3 hectare site on a steep hillside into seven lots, with associated earthworks and retaining structures. The site is described in the first decision report as follows:

"The topography rises from 5 metres above sea level, at the road level on X Street, to over 65 metres in the southwest corner of the site. There are three flatter areas, one is located near the road entrance, another is located in a shallow basin to the northwest, and the third is the crest of a steep spur located to the southwest. A significant portion of the southern end, and perhaps half the site, is very steep escarpment".

The site was surrounded by relatively low-density residential development dating from the 1940s and 50s.

The earthworks involved were quite extensive, covering some 4300m^2, or approximately one third or the site

Although not part of the consents sought, vegetation clearance was also envisaged along with the refurbishment of the existing dwellings, and the full development of all six lots would eventually contain two dwellings each. Thus the number of houses on the site would increase from three to twelve.

Step 2: Regulatory Context

The plans which are possibly relevant are the Wellington City District Plan relating to land use and subdivision, and the Wellington Regional Soil Plan, which amongst other aspects relates to land clearance and soil stability.

As site stormwater did not meet the definition of an intermittent or permanent stream, and was to be managed by piping into the existing storm water system, the regional plans relating to water management did not apply.

It was recognised that a range of building consents for a range of structures would be needed. It was also recognised that approval would be needed for some earthworks under the current City Council's bylaws.[13]

[12] Included amalgamating these lots and some small parts of adjoining lots with houses, to create a single development site, then initially proposed as a subdivision of six lots for dwellings and a shared access lot.

[13] Permitted earthworks are those less than 2.5 metres when measured vertically, less than 250m^2 area per site, not on a slope greater than 45 degrees, and at least 5 metres from a water body.

Step 3: Activity Status

In the District Plan, the only consents required were for subdivision and earthworks. Subdivision consent was needed as a discretionary (unrestricted) activity and the earthworks were a discretionary activity (restricted) with discretion related to "the alteration or disturbance of the ground" and the "degree of slope".[14]

In this case, the activities of subdivision and development were considered to be integrated, so both aspects were considered as a fully discretionary activity.

No resource consents were needed under the District Plan for vegetation clearance, or for the subsequent two dwellings per lot (subject to complying with bulk and location requirements such as height and separation distances for other dwellings).

Under the Regional Soil Plan, earthworks of more than 1000 square metres per hectare on slopes greater than 28 degrees requires a restricted discretionary consent. However, soil disturbance associated with conditions on a subdivision consent is excluded. This means that the resource consent sought from Wellington City Council which included earthworks as part of a subdivision consent, despite being extensive enough to trigger the regional earthworks rule, specifically removes the activity from requiring consent under this regional rule[15].

Step 4: Policy Context

Given the consent status, relevant policy is only found in two documents, the Regional Policy Statement and the Wellington City District Plan. Given the relatively small-scale nature of the proposal, the focus would be expected to be on the district plan.

A quick review of the two Regional Policy Statements, operative and proposed, shows that there are objectives and policies relating to hazards (including the need to obtain adequate information and to identify and consider risk, consequences, and alternative sites and measures), and that the City Council, through the district plan and its decision-making role in relation to subdivision, use and development, is the agency charged with this role. The proposed Regional Policy Statement includes policies for "avoiding subdivision and development in areas at high risk from natural hazards" as a matter to be included in district plans, and a further policy "minimising the risks and consequences of natural hazards" as a consideration relating to resource consents. Both documents note the implications of climate change as an issue in the

[14] Since the application was consented, the Council has consolidated its bylaws and deleted the parts related to earthworks. It has also changed its District Plan so now all aspects of earthworks come either under the relevant zone rules, or under the Code of Practice for Land Development.
[15] The logic being that only one council should be responsible for evaluating an application and ongoing supervision of any consent granted.

management of natural hazards, including the implication of increased frequency and intensity of storm events.

In the District Plan, there are a number of statements relating to sustainability[16] including reducing the risk of exposure to natural hazards and each of the Plan' sections, such as the section on the City's Residential Area has a relevant objective "to avoid or mitigate adverse effects of natural and technological hazards on people, property and the environment" [17] Associated with this objective is a policy to "ensure that earthworks and structures in Residential Areas do not exacerbate natural hazards, particularly flood events". [18]

Also identified as relevant in the Council's reports on the application were objectives and policies relating to amenity values[19], the protection of natural features and site access.

Neither the policy statement or plan priorities any set of objectives and policies over another, and the first objective for the Residential Area is "to promote the efficient use and development of natural and physical resources in Residential Areas". [20]

Step 5: Extent of Adverse Effects

The initial application was considered to lack adequate information, although a short letter from a Chartered Engineer, Geotechnical, was included. This letter explained that penetrometer tests had been undertaken and noted that parts of the site were blanketed by thick sand, which would require addressing. It also advised that the land was suitable for housing, and that retaining wall design could be undertaken using poles or geomesh and blocks. The Council considered it had inadequate information, and issued a further information request. A more comprehensive geotechnical report was then provided, and a landscape assessment[21].

Other adverse effects were considered, related to visual effects, access and on-site manoeuvring, clearance of vegetation and construction effects. Because of the policy context, all effects were considered on an equal footing. The Council sought the expert opinion of its in-house urban designer, access engineer, drainage engineer, water supply engineer and infrastructure planning engineer.

[16] Climate change is referred to only in general terms in relation to international protocols and agreements.
[17] Objective 4.2.7.
[18] Policy 4.2.7.4.
[19] Including a reference to the visual impact of earthworks, alongside a note which states that the City's bylaws address the safety aspects of earthworks.
[20] Objective 4.2.1.
[21] The landscape assessment was sought because the site was particularly visible, and contained part of the coastal escarpment.

The potential effects on the wider environment and on neighbouring properties were evaluated and considered to be insignificant, so no neighbours' written approvals were needed, the application was not notified and proceeded to be processed as a non-notified application.

Step 6: Extent of Positive Effects

The social and economic contribution of the potentially nine additional houses in the neighbourhood was recognised[22].

Step 7: Assess Positive and Adverse Effects in Policy Context

The Council decision which was eventually made noted the limited nature of any adverse effects, including potential natural hazard effects and visual and natural character effects, when balanced against positive effects of the development. The potential adverse effects associated with the removal of quite large quantities of sand from the site during the construction phase were also noted. The additional site runoff resulting from the additional hard surface associated with site development was seen as inevitable, but was not seen as exacerbating any existing natural hazard. It was also noted that the stability of earthwork cuts and any engineering requirements would be dealt with as part of the Building Act 2004 or bylaw consent.

Positive effects which were identified related to the use of the site for additional dwellings.

Step 8: Mitigation or Reduction of Adverse Effects

The decision was to grant consent to the application, subject to a number of conditions to mitigate effects or reduce the potential for adverse effects.

These included conditions:

- requiring compliance with the Council's Code of Practice for Land Development, Part B (relating to earthworks)
- relating to the management of silt and stormwater runoff.
- requiring the stabilisation of the site to the satisfaction of the Council before removal of any environmental and sediment controls following construction
- requiring dust management during construction
- requiring specific landscaping
- requiring that a Chartered Professional Engineer oversee the design of the retaining wall and supervise all earthworks. A PS4 Building Act certification

[22] Although it was also noted that the seven-lot subdivision was only slightly larger than a five-lot subdivision which would be a discretionary restricted activity, with the council retaining limited control over the development.

statement and as-built plans are to be provided to the Council at the conclusion of works.

Step 9: Outcome, Decision

The decision was to grant consent to the application, subject to the conditions noted above. Necessary building consents were subsequently granted, and the development proceeded.

4.2 Commentary and Subsequent Issues

In this case, the process set out in the Top-down Decision Tool could be seen to have been reasonably applied, with all steps included and the appropriate considerations brought to bear at the various stages of the process[23].

The land-owner proceeded with the development proposed. Development proceeded more slowly than anticipated, with site development still incomplete some five years after consent was granted, and a number of issues have subsequently arisen. While it is unlikely that "hindsight" would have led to a different process, or a different resource consent decision, it is possible that the conditions may have been more stringent.

It was found, when construction started, that the volumes of sand to be removed from the site were substantially greater than estimated by geotechnical engineers. This prolonged the earthworks, led to considerable difficulty with onsite stormwater and sediment management, and resulted in additional cost.

Nearby neighbours, who had registered concerns about the project based on their local knowledge of the site[24] but who had not been given the chance to make a submission due to the non-notification decision, complained to the Council many times about poor earthworks control, instability of the earthworked site, and their experience of excessive siltation of sumps, drains, and kerbs and channels, and consequent street flooding. Concern was also expressed about undermining of foundations of adjacent dwellings and the long-term integrity of the modified site.

Two significant rain events in late 2008 and early 2009 exacerbated the situation and led to some flooding of nearby properties, and the use of Council resources for a significant street and property cleanup. This was followed by the Council issuing Infringement and Abatement Notices. Further heavy rain events in late 2009 resulted in additional complaints and Council action. At that stage it was also found that the

[23] Although note comments in the next section under Lessons Learnt.
[24] Amongst early concerns expressed were the volumes of sand and the difficulty of finding a suitable base for structures such as retaining walls.

height of the earthworks and retaining walls exceeded the resource consents granted, and retrospective consents would be required.

Council officers have subsequently expressed concern about the amount of enforcement time involved and the potential for landslips on the modified site. The nearby resident community is continuing to live with an unfinished disturbed site and an unknown degree of additional geotechnical hazard.

4.3 Lessons Learnt

With the benefit of hindsight, more emphasis may have been placed in the decision on the risk of natural hazard associated with the development of the site and the extent of ground modification – overall, more than one third of the site area was subject to earthworks including cuts as extensive as 12 metres in height. Had consent still been granted, further emphasis may have been placed on the ability of the developer to actually carry out the work, practically and financially, through conditions.

The following aspects have been raised as lessons or queries requiring answers from this case study:

1. As the Regional Policy statement recognises climate change risk, and passes the responsibility for management of risks associated with earthworks, why is this not reflected in the District Plan in more detail? In this case the presence of the large volumes of sand resulted in extensive earthworks was known about, and sand is readily erodible in rainstorms, which are likely to increase in frequency and intensity. Although earthworks affected only part of the site, the remainder of the site and adjacent sites may experience consequential instability and washouts as a result.
2. As a consequence, was sufficient weight placed on natural hazard risk? In reality, it is unlikely that placing more emphasis on the policy would have resulted in a different outcome. However, the conditions may have been stronger and more effective.
3. Vegetation cover on such steep sites is seen as erosion protection. Why are there no rules relating to vegetation retention? Council Officers consider the extensive clearance of vegetation led to erosion, which occurred across a greater area of the site than just the earthworked area.
4. Why is there no control over the area of hard surface on residential sites? Increased hard surfaces on land results in more rapid runoff rates, resulting in enhanced erosion potential on and off-site and higher peak discharge rates. While this consequential change had not yet occurred on the case study site, with full residential development, it will occur, requiring careful design and management of on and off-site stormwater systems. As the remainder of the development (houses and subsequent subdivision) can take place without

further resource consents, there is no opportunity to limit the amount of hard surface

5. Would there have been benefits in terms of local knowledge and information, from public or limited notification? A number of residents, having got wind of a proposed development, had registered that by writing to the Council, and claimed to have a better understanding of the site than Council Officers were able to gain from the geotechnical report. At the end of the day, nearby residents were quite significantly adversely affected at times during the construction period. However, the Resource Management Act notification procedures have recently been altered and there is as yet little case law that applies to the new provisions. Risk of exposure to a potential effect is particularly difficult to consider within the context of these changes.
6. What weight can be placed on the circumstances of a developer and the perceived ability to carry out the work? In this case, the developer was a small-scale operator, working alone on a piecemeal basis, apparently with no clear strategy, and work was intermittent. While that would not be a reason to refuse consent, conditions such as an agreed specific programme and a bond could have been applied.

As with all site-specific proposals, decision-making is constrained to a large extent by the statutory documents, and decision-makers are reliant on the information provided and the processes in the Top-Down decision tool. It is important that policy is informed by most up to date information on risks, and that information is provided to the decision-maker that assists in achieving a sound decision and, if consent is granted appropriated conditions.

5. Conclusion

The Top-down Decision Tool aids decision-making within a formal context. The tool provides a systematic approach to apply the various and wide-ranging considerations that are brought to bear in "real-life" situations.

The case study provided shows the practical application of the tool. In this case, although the steps in the tool were properly applied, the outcome in the intermediate period has been undesirable. The proposal has resulted in localised effects which were not foreseen and there has been considerable cost to the community through the Council's ongoing involvement in an enforcement role.

The case study has however raised issues of policy relating to the management of natural hazards and urban intensification within the steeper parts of the urban area. This may result in changes to the District Plan which might better reflect the Regional Policy Statement's policy approach to natural hazard management and better serve the section 7 Resource Management Act recognition of climate change effects. The Plan Audit Tool [Tool 1.5A] could be applied as part of this process.

Even without a change to the District Plan, the case study (and other similar situations) has resulted in a situation where it is likely that Council decision-makers will pay more attention to the risk-related elements of urban intensification on Wellington's steep land. This may result in more applications being refused, or the imposition of more rigorous conditions.

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