



Mackenzie
DISTRICT PLAN REVIEW

TOMORROW'S MACKENZIE
KA AWATEA HŌU

Section 32 Report: Plan Change 22 – Light

Date: 20 September 2022

1. Introduction

Purpose of this report

- 1.1. Section 32 ('s32') of the Resource Management Act 1991 ('the RMA') requires an evaluation to be undertaken of the changes proposed to the Mackenzie District Plan ('District Plan') through Plan Change 22 (PC22). The evaluation must be provided in a report which examines whether the objectives are the most appropriate in achieving the purpose of the RMA, and whether the policies and methods, taking into account their costs, benefits, efficiency and effectiveness, are the most appropriate way to achieve the objectives. The report must also assess the risk of acting or not acting if there is uncertain or insufficient information about the subject matter of the provisions. The analysis set out in this report is to fulfil the obligations of the Council under s32 of the RMA.

Topic

- 1.2. This s32 report relates to the management of lighting with the District, in terms of the impact lighting has on the night sky, as well as on safety and amenity. The proposed new chapter aligns with the requirements of the National Planning Standards framework to have lighting provisions in a standalone chapter.

District Plan Review Process

- 1.3. The introduction of this chapter is part of Stage 2 of the overall review of the District Plan. The following process was undertaken to review the lighting provisions within the District Plan.
- 1.4. Background technical work was undertaken which involved:
 - a review of the operative District Plan provisions;
 - identification of key issues arising from the current provisions;
 - a review of relevant planning documents;
 - a review of the approach taken in other district plans; and
 - technical input from University of Canterbury.
- 1.5. Engagement with the community was then undertaken on the key issues identified from the background work undertaken, as well as potential options to address those issues, and the feedback received was then used to inform a 'Preferred Approach' to managing lighting within the District. The Preferred Approach was then used to draft the proposed provisions, which are evaluated in this report.

Provisions

- 1.6. This s32 report relates to the following chapter proposed within Part 2 – District-wide Matters of the District Plan:
 - General District-wide:
 - Light
 - 1.7. This new chapter will replace those parts of Section 12 – Signs and Outdoor Lighting of the Operative District Plan, that relate to lighting.
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Relationship with other stages

- 1.8. There are standards in the proposed Light chapter that apply differently to different zones (refer LIGHT-TABLE1). The zones referenced are those which apply under the current Plan. Stage 2 of the District Plan Review also includes Plan Change 21, which reviews the residential, commercial and industrial zoning and zone frameworks; but does not review any of the other current zones. It is acknowledged that in subsequent stages of the review (covering rural zones, open space and recreation zones and special purpose zones), consequential amendments may be required to this table when other zones are reviewed, to ensure the most appropriate light limits are applied to each zone. Any amendments that are proposed (if any) will be included in the scope of those future plan changes.

2. Statutory context

- 2.1. Sections 74 and 75 of the RMA set out legal obligations when changing a District Plan. Consideration needs to be given to matters including whether the plan accords with the Council's functions under Section 31 of the RMA and the provisions of Part 2 of the RMA. They also direct how the plan is to be drafted/considered in relation to a range of other statutory documents. The following section sets out those matters addressed in sections 74 and 75 that are relevant to this topic.

Functions under s31

- 2.2. Section 31 sets out the functions given to territorial authorities for the purpose of giving effect to the RMA in their district. Of relevance to this topic, territorial authorities have the function of establishing, implementing and reviewing objectives, policies and methods to: achieve integrated management of the effects of the use, development or protection of land and associated natural and physical resources in the district (s31(1)(a)); and control the actual and potential effects of use, development or protection of land (s31(1)(b)).

Part 2 of the RMA – Sections 5, 6, 7 & 8

- 2.3. Section 5 of the RMA sets out the purpose of the RMA as being to promote the sustainable management of natural and physical resources.
 - 2.4. Sustainable management, as defined in section 5, relates to how natural and physical resources are managed so as to provide for the well-being and for the health and safety of people and communities while also managing the adverse effects of activities on the environment. This is relevant to PC22, as the Light chapter provides a framework for how adverse effects on the environment from lighting are to be managed in a way that provides for the wellbeing and health and safety of the community.
 - 2.5. Section 6 contains a number of matters which requires persons exercising functions under the Act to recognise and provide for, as matters of national importance. Under section 6(e) this includes the relationship of Māori and their culture and traditions with their ancestral lands and other taonga.
 - 2.6. Section 7 includes other matters to which particular regard must be had and relevant to the lighting provisions, includes: the maintenance and enhancement of amenity values (s7(c)) and the maintenance and enhancement of the quality of the environment (s7(f)).
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- 2.7. Section 8 requires that the principles of Te Tiriti o Waitangi / the Treaty of Waitangi shall be taken into account when exercising powers and functions under the RMA. As the night sky has special significance to Ngāi Tahu and local rūnanga, these principles are considered to be relevant to PC22.

National Planning Standards

- 2.8. Section 75(3)(ba) of the RMA requires the district plan to give effect to any national planning standard. The District Plan Structure Standard provides for a chapter on light, to be contained in the General District-wide Matters section, in Part 2 – District-wide Matters. The District-wide Matters Standard directs that if provisions for managing light are addressed, they must be located in the Light chapter, and may include provisions for light spill and glare (including light spill limits) and specific requirements for common significant light generating activities.

Other Statutory Documents

- 2.9. There are no particular provisions in any National Policy Statement, Regional Policy Statement or Regional Plans that are relevant to this topic.
- 2.10. The Mackenzie Spatial Plans 2021 mention this topic in terms of noting that as part of the development of options for Takapō / Lake Tekapo, minimising light pollution of the dark sky is one of the long term opportunities for the community, and part of the community's aspirations for the future.

3. Strategic Directions

- 3.1. The following proposed Strategic Directions are relevant to this topic:

ATC-O1 Live, Work, Play and Visit

The Mackenzie District is a desirable place to live, work, play and visit, where:

- 1. there are a range of living options, businesses, and recreation activities to meet community needs;*
- 2. activities that are important to the community's social, economic and cultural well-being, including appropriate economic development opportunities, are provided for; and*
- 3. the amenity values and character of different areas are maintained or enhanced.*

NE-O1 Natural Environment

The values of the natural environment that make the District unique, contribute to its character, identity and wellbeing, and have significant intrinsic values, are recognised and provided for, and where appropriate protected and enhanced. This includes values associated with:

- 1. mahika kai resources;*
 - 2. night sky darkness;*
 - 3. outstanding natural features and landscapes;*
 - 4. significant indigenous biodiversity; and*
 - 5. water bodies and their margins.*
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- 3.2. The relevant aspects of these Strategic Directions seek to ensure that the amenity values and character of different areas are maintained or enhanced; and that the values associated with night sky darkness are recognised and provided for, and as appropriate, protected and enhanced. It also acknowledges that these values contribute to the District's uniqueness, character, identity and wellbeing.

4. Current Approach

- 4.1. The Operative Plan includes a chapter (Section 12) which relates to signs, outdoor lighting and aerial distractions. While some of the provisions apply to all three aspects (e.g. Objective 1), there are more specific provisions for lighting with respect to managing impacts of lighting on the night sky and separate rules relating to this aspect.
- 4.2. Currently the majority of rules apply within the Aoraki Makenzie International Dark Sky Reserve (AMIDSR), delineated in the Plan through the Outdoor Lighting Restriction map. This covers much of the District, including Twizel and Takapō / Lake Tekapo townships, but excludes townships east of and including Burkes Pass, as well as the western and northern-most rural areas of the district, including the Aoraki/Mount Cook National Park.
- 4.3. The rules require the following:
- In the AMIDSR, outdoor lighting to be shielded from above so that the edge of the shield is below the whole of the light source.¹
 - In the AMIDSR, all outdoor lighting is required to have a filter to filter out the blue or ultraviolet light, provided the light source would have more than 15% of the total emergent energy flux in the spectral region below 440nm. The filters used must transmit less than 10% of the light at any wavelength less than 440nm.²
 - In the AMIDSR, outdoor lighting for searchlights, illumination of buildings by floodlight, public recreational facilities, or light produced by high-pressure sodium, metal halide, mercury vapour lighting or fluorescent lighting cannot be used between 11pm and sunrise.³
 - All fixed exterior lighting to be directed away from adjacent roads, Lake Ruataniwha and other properties.⁴
- 4.4. These rules are also applied as a condition of consent or advice note generally applied to all resource consents for buildings located within the Outdoor Lighting Restriction Area.
- 4.5. In addition to the controls in the Plan, outdoor lighting is also managed through information provided with all Land Information Memorandums and buildings consents; and via a Council policy on street lighting.

¹ Rule 13.a.i.

² Rule 13.a.ii.

³ Rule 13.a.iii.

⁴ Rules 13.a.iv & 13.b.

5. Issues

Investment Logic Mapping

- 5.1. The Investment Logic Mapping undertaken for the District Plan review identified four key problems which the District Plan review should address. This included that the outdated and permissive nature of the Plan resulted in inconsistent and ad hoc decision making, creating perverse and undesirable outcomes. The current lighting rules were first enacted in 1981 through the Lighting Ordinance. The approach is therefore dated and concerns have been raised that aspects of it are out-of-date and overly permissive, as expanded on further below.

Light Pollution

- 5.2. The Mackenzie area is internationally recognised as one of the best sites for viewing and researching the night sky. Night sky tourism is a significant attraction for the District and source of income for the community. Critical to the quality of the experience are the Mt John Observatory, which is a University of Canterbury research facility, the Earth and Sky Tourism Building and the planetarium at Mt Cook Village. These sites provide access to specialized viewing of the night sky, have experienced guides and allow access to telescopes.
- 5.3. From a Ngāi Tahu and local rūnanga perspective, the night sky is an integral part of the natural and cultural landscape, with the mountains, lakes and sky being interwoven, in both a physical and spiritual sense. Māori used astronomy in navigation and other everyday practices, as well believing the stars governed good and bad fortune.
- 5.4. What makes the Mackenzie Basin night sky unique is its clarity and the absence of 'light pollution' (wasted light shining upward), which can brighten the sky, and hides the stars, the aurora and the other faint natural lights. Control of light pollution is therefore necessary to maintain dark skies and its value for tourism and research. While the current rules manage this to a degree, some concerns have been raised with them. This includes that the current rules only apply to outdoor lighting. As such they do not manage indoor lighting which also has the potential to result in light pollution, including skylights and display windows in commercial areas. The rules also pre-date the use of LED lamps, some of which contain more blue and green light which can result in light pollution.

Where Lighting Provisions are Applied

- 5.5. Most of the rules restricting lighting only apply in the area identified in the Outdoor Lighting Restriction map. Outside this area, the only control is that all fixed exterior lighting is directed away from adjacent properties and roads. This is considered to offer minimal protection from the potential nuisance effects of lighting. In terms of the impact of light pollution on the night sky, an application has been made to expand the AMIDSR to include the whole of the Mackenzie District. This provides an opportunity to manage light pollution consistently throughout the whole district.

Nuisance Effects

- 5.6. It is common in other district plans for limits to be placed on light spill between adjoining properties, primarily to mitigate potential effects on amenity. This is generally implemented through a lux spill level from outdoor lighting being applied, generally relative to zoning of the affected sites; and through requirements to direct light away from other properties. The
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Operative District Plan includes controls on the latter, but not the former. As such, there are limited controls managing potential nuisance effects of light spill between properties.

6. Technical Input and Consultation

Technical Input

- 6.1. The proposed rules were discussed with representatives of the University of Canterbury, who provided technical advice on updating the rules to reflect modern day lighting, and to address particular areas of concern.

Consultation

- 6.2. In accordance with Schedule 1, clause 3(1), consultation was undertaken with the Minister for the Environment, other Ministers of the Crown who may be affected the plan change, adjoining local authorities who may be affected, the regional council, and tangata whenua.
- 6.3. Mana Whenua, via Aoraki Environmental Consultants Limited staff being part of the project team, assisted with drafting of the Light chapter.
- 6.4. In addition, as part of community engagement on Stage 2 of the District Plan Review, people were surveyed in relation to several matters, including specific questions regarding lighting. In terms of the dark sky rules being applied across the whole District, over 80% of respondents supported this. Approximately 75% of respondents agreed with light spill limits being applied to manage nuisance effects of lighting on neighbours.

7. Scale and Significance

- 7.1. Section 32(1)(c) of the RMA requires that the s32 evaluation report contains a level of detail that corresponds with the scale and significance of the of the environmental, economic, social, and cultural effects that are anticipated from the implementation of the proposal.
 - 7.2. The Operative District Plan already contains provisions managing lighting. The key changes proposed in PC22 are:
 - Extending the rules relating to dark sky lighting to apply across the whole District, rather than only in the current AMIDSR. This introduces controls on outdoor lighting in eastern parts of the District where they do not currently apply.
 - Updating the rules, in line with advice received from Canterbury University, to better manage security lighting and skylights and bring the controls up to date in relation to LED lighting.
 - The introduction of light spill (horizontal and vertical illuminance) limits.
 - 7.3. Having considered the above matters, the scale and significance of the provisions is considered to be moderate. This reflects that in general, more controls are being introduced, and particularly in eastern parts of the District; but these restrict the type and nature of outdoor lighting that can be used rather than restricting its use completely.
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8. Evaluation of objectives

Introduction

- 8.1. Section 32(1)(a) requires an evaluation of the extent to which the objectives of the proposal are the most appropriate way to achieve the purpose of the RMA. The s32 report for the Strategic Directions has examined the extent to which the proposed Strategic Directions are the most appropriate way to achieve the purpose of the RMA. This section of the report therefore considers whether the objectives relating to this topic are the most appropriate way to achieve the Strategic Directions and the purpose of the RMA.

<p>Proposed Objective</p> <p><i>Outdoor lighting allows activities to occur beyond daylight hours and provides safety and security for activities, while:</i></p> <ol style="list-style-type: none"> 1. <i>protecting views of the night sky; and</i> 2. <i>managing light spill to maintain amenity values and the safe operation of the transport network.</i>
<p>Relevant Strategic Directions</p> <p><i>ATC-O1 Live, Work, Play and Visit</i></p> <p><i>The Mackenzie District is a desirable place to live, work, play and visit, where:</i></p> <ol style="list-style-type: none"> 1. <i>there are a range of living options, businesses, and recreation activities to meet community needs;</i> 2. <i>activities that are important to the community's social, economic and cultural well-being, including appropriate economic development opportunities, are provided for; and</i> 3. <i>the amenity values and character of different areas are maintained or enhanced.</i> <p><i>NE-O1 Natural Environment</i></p> <p><i>The values of the natural environment that make the District unique, contribute to its character, identity and wellbeing, and have significant intrinsic values, are recognised and provided for, and where appropriate protected and enhanced. This includes values associated with:</i></p> <ol style="list-style-type: none"> 1. <i>mahika kai resources;</i> 2. <i>night sky darkness;</i> 3. <i>outstanding natural features and landscapes;</i> 4. <i>significant indigenous biodiversity; and</i> 5. <i>water bodies and their margins.</i>
<p>Assessment</p> <p>The objective is considered the most appropriate way to achieve the purpose of the Act because it:</p> <ul style="list-style-type: none"> - Addresses the identified issues relating to light pollution on the night sky and potential nuisance effects arising from outdoor lighting. - Responds to the purpose of the RMA, by providing direction on how community well-being are to be provided for, in respect to outdoor lighting, while also directing how the effects of lighting on the environment are to be managed to provide for the wellbeing and health and safety of the community. This includes protection of a natural resource which contributes to community well-being through the benefits it has to tourism and research activities within the District.

- Recognises and provides for the relationship of Māori and their culture and traditions with the night sky.
- Seeks to maintain amenity values, consistent with s7(c)) and outlines those aspects of the quality of the environment that are sought to be maintained and enhanced, in accordance with s7(f).
- It assists the council to carry out its functions under s31, by providing an objective that seeks to provide an integrated management approach to lighting, while controlling the actual and potential effects of its use on other resources.
- In relation to ATC-O1, it seeks to manage outdoor lighting to maintain amenity values, consistent with clause 3 of that objective.
- In relation to NE-O1, it seeks to ensure that the values associated with night sky darkness are recognised and protected. The approach also recognises that the values associated with night sky darkness contribute to the uniqueness, character, identify and well-being of the District.
- Can be realistically achieved within the Council's powers, skills and resources.
- Is consistent with feedback from consultation with the community.
- Will not result in unjustifiably high costs on the community or parts of the community. While it is acknowledged that implementation of the objective may result in increased controls, these are not considered to impose unreasonable costs. In particular, the application of the objective (and related framework) to the whole District ensures a consistent approach and outcome is sought District-wide.
- Is sufficiently certainty and there is not considered to be a high level of risk associated with it.

Other options considered were retention of the existing objectives (with amendments to limit their application to outdoor lighting only), which are:

- *Outdoor Lighting, Signs and Aerial Distractions which avoid or mitigate adverse effects on public safety, convenience, and the visual amenity of the District.*
- *Maintenance of the ability to undertake effective research at the Mt John University Observatory and of the ability to view the night sky*

It is noted that the intent of the current objectives is largely still reflected in the proposed Objective, but the proposed Objective is considered to provide greater clarity, and also better recognises the benefits of outdoor lighting, rather than focussing only on mitigation of its effects.

Summary

- 8.2. Overall, the proposed objective is considered to appropriately respond to the identified issues, providing a clear statement of the outcome sought through the management of outdoor lighting, which is consistent with the purpose and relevant principle of the RMA.

9. Evaluation of proposed policies, rules and other methods

Introduction

- 9.1. Section 32(1)(b) requires an evaluation of whether the provisions are the most appropriate way to achieve the objectives by identifying other reasonably practicable options, assessing the efficiency and effectiveness of the provisions in achieving the objectives, and summarising the reasons for deciding on the provisions.
- 9.2. The assessment must identify and assess the benefits and costs of environmental, economic, social and cultural effects that are anticipated from the implementation of the provisions, including opportunities for economic growth and employment. The assessment must, if practicable, quantify the benefits and costs and assess the risk of acting or not acting if there is uncertain or insufficient information available about the subject matter.
- 9.3. The proposed provisions relating to lighting, have been grouped, for the purposes of this assessment, as follows:
 - Light pollution
 - Nuisance effects

Light Pollution provisions

- 9.4. The provisions assessed in this section are:

- Policies:

LIGHT-P2 Night Sky Darkness

Require outdoor lighting to minimise, as far as practicable, the potential for upward light spill that would adversely affect the ability to view the night sky.

- Rules, Standards and Matters of Discretion:

Provision	Summary
LIGHT-R1	Permits outdoor lighting, subject to specific types of outdoor lighting between 10.00pm and sunrise.
LIGHT-R2	Permits security lights, provided they are fitted with a motion sensor.
LIGHT-R3	Permits skylight windows, provided that there is no light spill from them after 10pm.
LIGHT-S2	Requires outdoor lighting to be shielded from above.
LIGHT-S3	Limits the correlated colour temperature of outdoor lighting.
LIGHT-S4	Restricts the type of lamps that can be used for outdoor lighting.
LIGHT-MD1	Lists matters of discretion applicable where a rule/standard above is breached.

- 9.5. Key changes from the status quo are:

- Applying the controls to the entire District, not just the current AMIDSR.
 - Replacing the exiting filtration rule with a colour temperature and lamp type rule.
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- Bringing forward the time at which specified types of outdoor lighting must be turned off at night, from 11pm to 10pm.
- Introducing a new control on skylights to require that they do not result in light spill after 10pm.
- Requiring that security lights are fitted with a motion sensor.

9.6. The following table identifies the strategic directions and objectives that are relevant to the assessment of this group of provisions and provides an assessment of the effectiveness and efficiency of the proposed provisions in achieving those objectives. The assessment includes identification and assessment of the benefits and costs of the environmental, economic, social, and cultural effects that are anticipated from the implementation of the provisions.

Relevant Strategic Directions		
NE-O1 Natural Environment		
<p><i>The values of the natural environment that make the District unique, contribute to its character, identity and wellbeing, and have significant intrinsic values, are recognised and provided for, and where appropriate protected and enhanced. This includes values associated with:</i></p> <ol style="list-style-type: none"> <i>1. mahika kai resources;</i> <i>2. night sky darkness;</i> <i>3. outstanding natural features and landscapes;</i> <i>4. significant indigenous biodiversity; and</i> <i>5. water bodies and their margins.</i> 		
Relevant Objective		
LIGHT-O1 Outdoor Lighting		
<p><i>Outdoor lighting allows activities to occur beyond daylight hours and provides safety and security for activities, while:</i></p> <ol style="list-style-type: none"> <i>1. protecting views of the night sky; and</i> <i>2. maintaining amenity values, health and safety and the safe operation of the transport network.</i> 		
	Benefits	Costs
Environmental	<ul style="list-style-type: none"> • Manages potential adverse effects on the night sky. 	<ul style="list-style-type: none"> • None identified.
Social	<ul style="list-style-type: none"> • Controls which minimise potential upward light spill will assist in protecting the values associated with the darkness of the night sky that are important to the community, including the contribution that night sky darkness to the District's identity and uniqueness, and to research activities. 	<ul style="list-style-type: none"> • Some recreation activities rely on outdoor lighting, which may be affected by lighting controls. While the controls do not preclude lighting for these activities, they may reduce its effectiveness.

Economic	<ul style="list-style-type: none"> • While introducing additional controls, the provisions still provide for the use of outdoor lighting which meets the controls. • Controls which minimise potential upward light spill will assist in protecting the values associated with the darkness of the night sky, and the associated businesses, particularly tourism activities, that benefit both directly and indirectly from this. 	<ul style="list-style-type: none"> • Applies the current controls to a wider area; and introduces additional controls. These will have some additional costs in terms of reduced options for lighting and potentially more expensive lighting and where a rule is breached, the costs associated with the resource consent process.
Cultural	<ul style="list-style-type: none"> • Assists in the protection of the night sky and educates the public about the importance of Matariki from a cultural perspective. The night sky resembled specific constellations that were an integral part of the journey to Takapō / Lake Tekapo to gather mahika kai for the winter months. 	<ul style="list-style-type: none"> • None identified.
Efficiency		
<p>The proposed provisions are considered to be an efficient way to achieve the objectives. While there are some social and economic costs associated with the additional controls, these are considered to be outweighed by the significant environment, social and economic benefits of the provisions. This includes that the proposed provisions are considered to support economic growth and employment because they will help to support dark sky tourism.</p>		
Effectiveness		
<p>The proposed provisions are considered to be an effective way of achieving the objectives. In particular, they are based on recommendations from the University of Canterbury about controls that are necessary to maintain night sky darkness and which better reflect changes in lighting technology and the impact these can have on the night sky. They also address gaps identified with the current provisions which are expected to increase their effectiveness.</p>		
Alternative Approach 1		
<p>Continuation of the current rules.</p>		
Appropriateness Assessment		
<p>Retaining the current approach is not considered to be as effective at achieving the outcomes sought. In particular they do not manage some forms of lighting (security lighting and sky lights) that have been identified as resulting in upward light spill that adversely effects the ability to view the night sky. The current rules pre-date the use of LED lamps, some of which contain more blue and green light which can result in light pollution. The current light pollution rules also only apply to some of the District, and therefore result in no cost to those parts of the District outside the current AMIDSR. However, the strong</p>		

community support for applying the controls District-wide indicates that the benefits of this expansion are considered to outweigh these costs.
Alternative Approach 2
Retaining 11pm as the time at which specified types of outdoor lighting must be turned off at night.
Appropriateness Assessment
The key advantage of this approach is that it is consistent with the existing rules and therefore established and new lighting would be subject to the same rules. As such, it is acknowledged that it would be more efficient, particularly from an enforcement perspective. However, the benefits of bringing forward the time to 10pm for tourism and research activities are considered to outweigh this. While the proposed new rules will not apply to existing lighting, the Council can use education and advocacy measures to encourage existing lighting to be turned off at 10pm, noting that some lighting operators have already voluntarily adopted a 10pm lights off policy. This will help address any inefficiency associated with the proposed change in times.
Alternative Approach 3
Including a rule requiring no direct light spill through uncovered windows after 10pm (i.e. must close curtains or turn off lights).
Appropriateness Assessment
This type of rule was requested by the University of Canterbury as an additional measure to control light spill from interior lighting in residential and commercial properties. Such an approach is considered to be inefficient, as it would be very difficult to monitor and enforce. The costs associated with this approach, in terms of it imposing a high level of control on ongoing property use, was not considered to outweigh the benefits. It is considered ore appropriate to encourage window coverings and turning off lights via non statutory methods such as education and advocacy.

Risk of acting or not acting

- 9.7. Section 32(2)(c) of the RMA requires that the efficiency and effectiveness assessment also assesses the risk of acting or not acting if there is uncertain or insufficient information about the subject matter of the provisions.
- 9.8. The difference between the current Plan provisions, in respect to light pollution, and those proposed in PC22, are based on technical input from the University of Canterbury, as well as feedback received from community consultation. This is considered to provide sufficient information to inform the drafting of proposed light pollution provisions. The risk of acting in the manner proposed is therefore considered low. Conversely, the risk of not acting is that the current provisions will remain outdated in terms of not responding to identified issues and not reflecting more recent developments in lighting technology, thereby risking achievement of the outcomes sought.

Overall evaluation of appropriateness

- 9.9. Overall the light pollution provisions are considered the most appropriate in achieving the relevant objectives. While they introduce greater controls, the benefits of these are considered to outweigh the costs, particularly given the importance of dark sky tourism to the District, and result in a targeted fit-for-purpose set of provisions.

Nuisance Effects Provisions

9.10. The provisions assessed in this section are:

- Policies:

LIGHT-P1 Managing Outdoor Lighting

Manage the location, design and operation of outdoor lighting to ensure:

1. *it does not distract or interfere with traffic; and*
2. *it is compatible with the zone in which any light spill or glare is received.*

- Rules, Standards and Matters of Discretion:

Provision	Summary
LIGHT-S1	Requires fixed exterior lighting to be directed away from any adjacent roads, residential properties.
LIGHT-S5	Restricts the horizontal or vertical illuminance levels of light spill at the boundary of adjoining sites, relative to the zoning of the adjoining site.
LIGHT-MD2	Lists matters of discretion applicable where a standard above is breached.

9.11. The key changes from the status quo are the introduction of restrictions on the maximum level of light spill from outdoor lighting on an adjoining site. The specific limits are different depending on the zoning where the light is received.

9.12. The following table identifies the strategic directions and objectives that are relevant to the assessment of this group of provisions, and provides an assessment of the effectiveness and efficiency of the proposed provisions in achieving those objectives. The assessment includes identification and assessment of the benefits and costs of the environmental, economic, social, and cultural effects that are anticipated from the implementation of the provisions.

Relevant Strategic Directions
<p><i>ATC-O1 Live, Work, Play and Visit</i></p> <p><i>The Mackenzie District is a desirable place to live, work, play and visit, where:</i></p> <ol style="list-style-type: none"> 1. <i>there are a range of living options, businesses, and recreation activities to meet community needs;</i> 2. <i>activities that are important to the community's social, economic and cultural well-being, including appropriate economic development opportunities, are provided for; and</i> 3. <i>the amenity values and character of different areas are maintained or enhanced.</i>
Relevant Objective
<p><i>LIGHT-O1 Outdoor Lighting</i></p> <p><i>Outdoor lighting allows activities to occur beyond daylight hours and provides safety and security for activities, while:</i></p> <ol style="list-style-type: none"> 1. <i>protecting views of the night sky; and</i>

2. <i>maintaining amenity values, health and safety and the safe operation of the transport network.</i>		
	Benefits	Costs
Environmental	<ul style="list-style-type: none"> Ensures adverse effects of lighting are managed relative to the sensitivity of the receiving environment. 	<ul style="list-style-type: none"> None identified.
Social	<ul style="list-style-type: none"> Lighting will be managed to maintain the amenity values of areas, contributing to the desirability of the District. 	<ul style="list-style-type: none"> None identified.
Economic	<ul style="list-style-type: none"> While introducing additional controls, the provisions still provide for the use of outdoor lighting which meets the controls. 	<ul style="list-style-type: none"> Introduces controls that do not currently apply. These may have some additional costs in terms of designing or controlling lighting to comply, and where a rule is breached, the costs associated with the resource consent process.
Cultural	<ul style="list-style-type: none"> None identified. 	<ul style="list-style-type: none"> None identified.
Efficiency		
Overall, the economic costs of the proposed provisions are considered to be outweighed by the environmental and social benefits. As such, the provisions are considered to be an efficient way to achieve the objectives. The provisions are expected to have a neutral impact on economic growth and employment.		
Effectiveness		
The proposed provisions are considered to be an effective way of achieving the objectives. The application of light spill limits is considered necessary to achieve the outcomes sought in terms of maintaining amenity values, while still providing for the use of outdoor lighting for a range of activities.		
Alternative Approach 1		
Do not apply light spill limits.		
Appropriateness Assessment		
This option reflects the status quo. As the current rules only require that fixed exterior lighting is directed away any adjacent residential properties and lakes, this approach is not considered sufficient to ensure that amenity values of different areas, or that health and safety or people and communities, are maintained.		

Risk of acting or not acting

- 9.13. Section 32(2)(c) of the RMA requires that the efficiency and effectiveness assessment also assesses the risk of acting or not acting if there is uncertain or insufficient information about the subject matter of the provisions.
- 9.14. The proposed provisions introduce light spill limits between adjoining sites. Such limits are commonly used in other district plans to manage the nuisance effects of lighting on neighbouring properties, and the proposed limits are consistent with those applied in other

plans. There was also a high level of support from the engagement on Stage 2 for introducing such controls. As such, the approach proposed is not unusual and is considered to be low risk.

Overall evaluation of appropriateness

- 9.15. Overall the provisions related to managing nuisance effects from outdoor lighting are considered the most appropriate in achieving the relevant objectives. While they introduce new controls, the benefits of these are considered to outweigh the costs, and are consistent with the approach taken in many other district plans at managing potential nuisance effects from lighting.

10. Conclusion / Reasons

- 10.1. This evaluation has been undertaken in accordance with Section 32 of the RMA. It has provided an assessment of the appropriateness of the provisions within PC22 relating to the Light chapter, at achieving the purpose of the Act. This has included considering their efficiency and effectiveness, and their contribution towards achieving the Strategic Directions.
- 10.2. Overall, the key changes in PC22 from the operative District Plan approach are to expand the application of the light pollution-based controls to apply a consistent approach across the District, and to update them to better take into account modern lighting and manage its potential effects on the darkness of the night sky, as well as address known gaps. In terms of managing nuisance effects, PC22 proposes to introduce light spill limits at boundaries to better manage potential effects. While there are costs associated with the increased level of control, they are considered necessary to address the issues identified and overall are expected to better achieve the objectives.
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