

# Memorandum

**To:** Luke Faithful, Andrew Brown (Mitchell Daysh Planning)

**From:** Don McKenzie

**cc:** Tracey Morse (NZCE)

**Date:** 16 January 2025

**Re:** **NZCE Darfield Agrivoltaic Facility: Section 92 Request for Further Information Response (Transportation)**

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## Introduction

At the request of New Zealand Clean Energy (“**NZCE**”), Don McKenzie Consulting Ltd has provided an assessment and the following responses to the Request for Further Information (“**RFI**”) received from Selwyn District Council (“**SDC**”) in respect of the Darfield Agrivoltaic Facility, Homebush Road.

## Response to RFI

This memo addresses and responds to four transportation matters raised in the SDC’s RFI request. The requests are cited and presents in italics below with the response following each item.

### Request #1

*Please provide further information regarding the assessment of the right hand turns at the S73 / Homebush Road intersection, including:*

- a. Please clarify why 80 vehicles per hour has been assumed as the maximum threshold for right hand turns; and*
- b. Whether minor works are required to enable a through vehicle to safely pass a right-turning vehicle in the live land.*

### Response

Section 5.3.3 of the Transportation Assessment Report (“**TAR**”) presents in detail the adopted approach to assessment of the requirement for an infrastructure response to the construction



related traffic movements associated with the NZCE proposal. Assessing the potential requirement for a new right turn bay at SH73/Homebush Road to cater for this construction period traffic movements (expected to occur over approximately 18 months, after which time demands will drop to current traffic volume levels) commenced with review of the relevant AUSTROADS warrant criteria (for new roading infrastructure delivery) in relation to the current form and function of the Homebush Road / SH73 intersection. It then proceeded to discussions with NZTA representatives and then resulted in the development of a Construction Traffic Management Plan based on the feedback received from NZTA (see response to Item 2 below).

As will be discussed below and in the attachments relating to the discussions with NZTA personnel, the adoption of the 80 vehicles per hour criteria emerged after specific consideration of the AUSTROADS turn warrant and the range of “validity” presented in the AUSTROADS turn warrant (see Figure 11 of the TAR), alongside a range of other criteria and relevant matters including:

- The limited time period of the elevated turning volumes during the construction period;
- During construction there will be a generally familiar workforce who will be travelling the route along SH73 and into Homebush Road on a daily basis;
- There are available a range of demand management measures that can be adopted by NZCE and its construction contractor that can avoid a major infrastructure response that will have only a limited period of benefit or requirement;
- The major road (SH73) volume indicated by the green vertical line on Figure 11 of the TAR together with the adopted 80vph occurs on the AUSTROADS warrant chart at the boundary of the grey shaded area in the upper left hand quadrant of the chart where the basic treatment (i.e. reliance upon shoulder width without the need for a dedicated turn bay) is considered generally appropriate.

After discussion with NZTA staff, the adoption of the 80 vph threshold was agreed between NZCE and NZTA as a fair and reasonable level beyond which further physical infrastructure would be required, and below which a demand management approach would be more appropriate.

#### Request #2

*Please provide correspondence from NZTA that demonstrates support for the proposed mitigation measures at the intersection during construction.*

#### Response

Attached to this memo are copies of the correspondence between the Applicant and NZTA.

As part of the discussions between NZCE, NZTA and KiwiRail, it was identified and confirmed in broad principle between the parties, that NZCE would be seeking to utilise a staffed level crossing management solution (referred to by KiwiRail as the Rail Protection Officer “**RPO**”) that would address the combined needs for traffic management at both the level crossing and the SH73 intersection. The RPO process is currently being discussed, refined and agreed with KiwiRail and is intended to provide an elevated degree of management personnel oversight on the use of both the SH73 intersection and the level crossing (given they are adjacent to each other). The RPO can ensure compliance with the CTMP controls and turning movement



threshold limits, with the RPO having the ability to communicate with NZCE site manager if vehicle movements into Homebush Road approach the maximum threshold.

### Request #3

*Please provide a copy of the LCSIA and correspondence with KiwiRail regarding the recommendations of the LCSIA.*

### Response

Discussions and agreements between NZCE and KiwiRail are ongoing. As noted in the TAR, a Draft LCSIA has been prepared and is currently being considered alongside KiwiRail's So Far As Is Reasonably Practical ("SFAIRP") process. NZCE is not currently in a position to circulate the LCSIA or SFAIRP reports. It is expected that the completion of these processes will result in an outcome that is satisfactory to both NZCE and KiwiRail, and as such address all of the relevant matters to operation and safety of the rail level crossing required to be addressed within the consent application.

### Request (glint and glare)

*Mitigation Landscaping and Road Safety: Mr Van der Velden has noted that there is a potential safety effect associated with clear sightlines for traffic movements around the site resulting from the proposed 2 – 3m or 4m mitigation plantings. As I understand it, Mr Van der Velden was raising this as a matter for consideration by the applicant to ensure that one mitigation measure does not cause any additional issues. Addressing this issue may be addressed through the transport assessment and / or through the planting plan.*

### Response

I have been asked to comment on the transportation safety aspects of the glint and glare issues raised by Council (and its peer reviewer Mr van der Velden). I have reviewed the response prepared by Mr Mansergh on behalf of NZCE (dated 9 December 2024). I also provided some preliminary input to Mr Mansergh in the preparation of his detailed analysis and assessment based on likely vehicle dimensions and other parameters. I was also part of the preliminary conversations with both NZTA and KiwiRail representatives who raised the potential issues of glint and glare in terms of the Midland Rail Line and SH73.

From a transportation and safety risk perspective, I concur with the findings and assessments made (and techniques used) by Mr Mansergh in his assessment, compared with the more "first principles" approach taken by Mr van der Velden. In particular, the recommendations included by Mr Mansergh in his response to the Council's RFI that screen planting of a minimum of 3m height be established and maintained to screen the view of the panels from the critical viewing locations including SH73, Midland Rail Line, Auchenflower Road and the Homebush Road (West) approach to the intersection with SH73.

I agree with Mr Mansergh's recommendation that during the interim period prior to any mitigation planting reaching a minimum of 3m in height, that shade cloth up to a height of 3m be installed along the SH73 boundary of the site as indicated in Figure 2 of his memorandum.

I have been asked to comment on the transportation safety risk associated with the proposed mitigation (both permanent and interim scenarios with screening to a minimum of 3.0m). I



have referred to Mr Mansergh's more detailed assessment of those areas of the site perimeter (primarily Homebush Road (west), Auchenflower Road, SH73 and the Midland Rail Line) where such treatment will be required.

#### *Auchenflower Road*

In relation to the potential safety-related issues associated with glint or glare along the Auchenflower Road route to the north of the agrivoltaic facility, I consider that the very modest levels of traffic movement along this route both currently and likely in the future, means that this issue is unlikely to be significant. While there may be the incidence of glint or glare experienced for a driver along this route, the generally low traffic volumes (approximately 115 vehicle movements per day or approximately 10 vehicles per daylight hour) means that the risk associated with this occurrence of glint or glare is quite low. Even in the remote possibility of a driver experiencing any glint or glare and needs to take evasive action to manoeuvre past another vehicle or veer off the road, there is a negligible possibility of encountering another vehicle in the opposite direction, and there are generous road shoulders on both sides of Auchenflower Road to enable a vehicle to momentarily driver over the shoulder/berm as needed.

#### *SH73 and Midland Rail Line*

I have reviewed the commentary and assessment made in Mr van der Velden's review on behalf of Council especially in regard to any greater safety risk associated with particularly high vehicles and a greater risk of being distracted or adversely affected by glint and glare. Mr Mansergh's visual and landscape assessment accompanying the consent application (pg 24) shows that the critical time periods for potential glint/glare along SH73 and the Midland Rail Line are between approximately 6.30am and 8.30am during the months of April to September. I have assessed the traffic volume records available from NZTA for the SH73 count station at the northern end of Darfield (south of the application site) for the week commencing 11 April 2024 to determine the number of heavy vehicles (in excess of 11m in length being those vehicles where the truck driver is likely to be seated at a higher level) between 6.30 and 8.30am.

The data from the two-way count showed the average number of >11m long trucks recorded in this 2hr morning period was 48 vehicles with a maximum of 100 and a minimum of 10.

In terms of the height matter I consider that Mr van der Verden's assessment of the likelihood of truck driver heights greater than the industry-standard Austroads guidance is over-estimated. The legal maximum height of NZ vehicles is 4.25m without specific permit, and hence the driver's eye height sitting at least 1m below the level of the top of the vehicles trailer or load, places the standard driver's eye height at 3.25m or below. While the above-referenced NZTA traffic volume data cannot precisely determine the height of these vehicles or their driver's eye height, it is considered that without special over-dimension permit all non-permitted (i.e. standard format trucks) would be associated with a driver's eye height of less than 3.25m.

The only situation where the driver's eye height and hence susceptibility to potential glint/glare above the height of the proposed 3.0m screening would be associated with over-dimension vehicles which in my experience would typically be travelling this route over-night when the potential for glint/glare issues is effectively zero. Even if such over-height vehicles were to pass along the SH73 corridor, there would need to be the exact combination of



glare/glint, overall sun conditions and the vehicle driver's height above 3.0m. It is therefore assessed that the overall transport safety risk associated with such over-height vehicles being susceptible to glint and glare beyond the proposed interim and ultimate screening height is effectively negligible or at worst very low.

#### *Homebush Road (west)*

Mr Mansergh's assessment (page 8 of his 9 December 2024 memorandum) of the proposed 3.0m minimum height screening identifies a minor remaining "green" glare potential for eastbound vehicles on Homebush Road (west) as they approach the intersection with SH73. From consideration of the middle right hand side graph on page 8 of Mr Mansergh's memo it is evident that there is a theoretical possibility of low potential for after-image glare (green part of the graphs on page 8) for a handful of minutes per day between April and September.

As a means of putting this into the context of safety risk, and as reported and assessed previously in relation to other viewpoints and corridors, an assessment is made in terms of the number and frequency of vehicles that may be exposed to this risk of glint and glare. The latest traffic count information available from the MobileRoads website<sup>1</sup> shows daily volumes (two-way) along Homebush Road (west) is 44 vehicles per day. As would be expected for a rural road such as this, the directional split of travel directions would be 50/50 – meaning the daily volume in the eastbound direction would be approximately 22 vpd. In the busiest hour of the day the volume in the eastbound direction would typically be no more than two or three vehicles per hour, and the probability that there would be one vehicle within five minutes when there is a risk of glare, would be very close to zero.

Even in the remote possibility of an eastbound vehicle experiencing any glint or glare, it is assessed that the visual cues and overall field of view available to eastbound vehicles approaching the SH73 intersection, provides sufficient information including the standard Give Way signage prior to getting to the intersection, plus a view of the level crossing signage, to inform drivers that they are approaching an intersection. The presence of high voltage pylons diverting away from the single, straight line along Homebush Road also avoids the risk of an eastbound driver seeing only the single row of power poles or pylons.

Overall, the transport safety risk associated with the minimal remaining glare (after the mitigation screen is in place) along this Homebush Road (west) approach given its low traffic volume and the time period over which the glare may be evident, is considered to be negligible.

#### *Effect of Landscape/Mitigation Planting on Access Sight Distances*

With regard to the potential for effects arising from the proposed landscaping and/or mitigation planting in relation the sightlines for vehicle movements to and from the site, the following factors are considered relevant:

- this site has frontage to straight and level roads;
- both Loes Road and Homebush Road have 20m wide legal road reserves with grass berms of between 6 and 8m between the site boundaries and the edge of the gravel road formation;

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<sup>1</sup> [www.mobileroad.org](http://www.mobileroad.org)



- any landscape/mitigation planting will be located within the site boundaries and therefore not impinge on the sight distances available at each access point (with each sight distance adopting only public road reserve area);
- there is more than adequate sight distance typically in excess of 200m available along both site frontage roads which is commensurate with the operating speeds of those roads;
- at the SH73/Homebush Road intersection, the proposed mitigation planting along the site boundary is beyond the intersection sight triangles (and on the eastern side of the Midland Railway line, and therefore does not impact the operation of the intersection.

Accordingly, it is concluded that any proposed landscape/mitigation planting will not bring about any degradation of the assessed safe sight distances at either of the proposed access points or at the SH73/Homebush Road intersection.

***Don McKenzie Consulting Ltd.***

*Attach: NZTA Email Correspondence (June - July 2024)*

## Don McKenzie

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**From:** Josh Kenneally <Josh.Kenneally@nzta.govt.nz>  
**Sent:** Friday, 26 July 2024 1:27 pm  
**To:** Don McKenzie  
**Subject:** RE: Darfield Solar, Homebush Road/SH73

Hi Don,

Apologies for the delay in response, I have been discussing the function of this condition with our safety and planning teams. To summarise, NZTA have been asked to assess the viability of a Traffic Management Plan condition which would minimise right hand turn movements to the site (via SH73/ Homebush Road intersection) to a maximum of 80 vehicle movements per hour. I understand the applicant will be seeking to limit the vehicle movements to a maximum of 80 per hour to avoid the need for physical intervention on the SH2, in accordance with Aust. Road intersection warrant guidelines.

In principle, NZTA note limiting the vehicle numbers to 80 per hour would suitably manage adverse traffic effects on the SH73/Homebush Road intersection to a point that no physical upgrades are required. However, there are questions surrounding how such a condition would operate in practice, monitored, and enforced. Notably what contingencies are appropriate should the applicant breach the 80 vehicle per hour limit, (i.e., would one breach warrant a stop work order to upgrade the intersection?). From NZTA's POV the ideal situation would be for physical intervention to be undertaken (i.e., shoulder widening and potentially right turn bay) which would avoid the uncertainty and risk of non-compliance a TMP condition would present. However, NZTA are open to discuss the operation of a TMP condition, noting the condition would need to provide certainty adverse safety risks would be managed should the vehicle limit per hour be breached.

I am unsure if conversations have been held with Council, but it may be beneficial to loop in Council's Compliance Monitoring Officer to see if there are any solutions to this issue.

Kind regards,

### Josh Kenneally

**Environmental Planner - Central**  
**Poutiaki Taiao | Environmental Planning**  
Transport Services  
Email: [josh.kenneally@nzta.govt.nz](mailto:josh.kenneally@nzta.govt.nz)  
Phone: 04 830 5774

### NZ Transport Agency

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**From:** Don McKenzie <don@dmconsulting.co.nz>  
**Sent:** Wednesday, June 26, 2024 11:44 AM  
**To:** Josh Kenneally <Josh.Kenneally@nzta.govt.nz>  
**Cc:** Andrew Brown (andrew.brown@mitchelldaysh.co.nz) <andrew.brown@mitchelldaysh.co.nz>; Tracey Morse <tracey@nzcleanenergy.nz>  
**Subject:** Re: Darfield Solar, Homebush Road/SH73

Josh

Do you have any update from your internal meeting with colleagues about the approach we discussed when we spoke previously?

Kind regards | Ngā mihi

Don

E: [don@dmconsulting.co.nz](mailto:don@dmconsulting.co.nz)

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**From:** Don McKenzie <[don@dmconsulting.co.nz](mailto:don@dmconsulting.co.nz)>

**Sent:** 17 June 2024 15:57

**To:** Josh Kenneally <[josh.kenneally@nzta.govt.nz](mailto:josh.kenneally@nzta.govt.nz)>

**Cc:** Andrew Brown (<[andrew.brown@mitchelldaysh.co.nz](mailto:andrew.brown@mitchelldaysh.co.nz)> <[andrew.brown@mitchelldaysh.co.nz](mailto:andrew.brown@mitchelldaysh.co.nz)>; Tracey Morse <[tracey@nzcleanenergy.nz](mailto:tracey@nzcleanenergy.nz)>

**Subject:** Re: Darfield Solar, Homebush Road/SH73

Josh

Thanks for the chance to talk through the right turn issue for Homebush/SH73. It was a useful conversation.

From the initial consideration of travel demand management measures that NZ Clean energy (and its construction contractor) the following items can be put forward as consideration for a possible Transport Management Plan (TMP) to be part of the application for the agrivoltaic facility:

1. Objective of any TMP would be to minimise the right turn volumes from SH73 into Homebush Road during the weekday morning arrival period (so as to avoid the requirement for physical works at the SH73/Homebush intersection while maximising safety of turning and through movements)
2. Applicant would forecast the requirements for staffing approximately one week in advance of construction requirements
3. the following potential transport demand arrangements and interventions will be considered and adopted:
  - a. Carpooling / shuttle buses;
  - b. spatial distribution/direction of staff movements onto alternative routes; and
  - c. Staggered timing of staff shifts
4. Sample survey/monitoring and reporting of staff numbers and right turning volumes would be considered if an automated means can be identified and agreed with NZTA (potentially focussed to those periods when the potential RTB volume warrant might be reached)
5. Details of interventions/monitoring will be confirmed within the finalised TMP to be prepared post-approval. Draft of the TMP will be prepared and submitted with the Application when lodged with SDC
6. Applicant prepared to advance a condition of consent that requires the Applicant to engage with and seek feedback from NZTA, and provide commentary as to the adoption (or otherwise) of any feedback recommendations, before submitting final TMP to SDC for certification.

I trust this captures what we discussed last week and is of assistance to your internal conversations with colleagues this week.



Kind regards | Ngā mihi

Don

E: [don@dmconsulting.co.nz](mailto:don@dmconsulting.co.nz)  
[REDACTED]

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**From:** Don McKenzie <[don@dmconsulting.co.nz](mailto:don@dmconsulting.co.nz)>

**Sent:** 11 June 2024 14:17

**To:** James Long <[James.Long@nzta.govt.nz](mailto:James.Long@nzta.govt.nz)>; Josh Kenneally <[josh.kenneally@nzta.govt.nz](mailto:josh.kenneally@nzta.govt.nz)>

**Cc:** Andrew Brown ([andrew.brown@mitchelldaysh.co.nz](mailto:andrew.brown@mitchelldaysh.co.nz)) <[andrew.brown@mitchelldaysh.co.nz](mailto:andrew.brown@mitchelldaysh.co.nz)>; Tracey Morse <[tracey@nzcleanenergy.nz](mailto:tracey@nzcleanenergy.nz)>

**Subject:** Re: Darfield Solar, Homebush Road/SH73

James/Josh

With the assistance of the data that one of your colleagues helpfully sent through, I have prepared a draft assessment of the right turn bay warrant applying to the Homebush/SH73 intersection. I attach the preliminary memo I prepared for the client which shows as you indicated James in our call last month.

This highlights a need for careful consideration of the intersection, especially given the temporary nature of traffic generation activities associated with the construction phase. I have been discussing with the Applicant as to the means by which shared worker transport can be incorporated into the application and the proposal. They are open to discussing the means by which this might be achieved.

Could we find a time in the next day or so to discuss this amongst the three of us.

Kind regards | Ngā mihi

Don

E: [don@dmconsulting.co.nz](mailto:don@dmconsulting.co.nz)  
[REDACTED]

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**From:** Don McKenzie <[don@dmconsulting.co.nz](mailto:don@dmconsulting.co.nz)>

**Sent:** 05 June 2024 09:20

**To:** James Long <[James.Long@nzta.govt.nz](mailto:James.Long@nzta.govt.nz)>

**Cc:** Josh Kenneally <[josh.kenneally@nzta.govt.nz](mailto:josh.kenneally@nzta.govt.nz)>

**Subject:** Darfield Solar, Homebush Road/SH73

James

Just getting into the further assessment of the right turn bay warrants for the Homebush intersection and wondering whether you could provide (or point me to where I could find) traffic data for SH73 in the location west of Darfield. I'd appreciate any hourly data you could identify so I can work through the AUSTROADS warrant assessment (presume this would be the process NZTA would wish to consider).

Kind regards | Ngā mihi

Don



Email: [don@dmconsulting.co.nz](mailto:don@dmconsulting.co.nz)

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