

## **Appendix 5 – Memo from Abley Transportation Ltd on Transport Matters**



# Proposed Timaru District Plan

## Review of transport submissions

<b>Prepared for</b>	Timaru District Council
<b>Project Number</b>	TDC-J052
<b>Revision</b>	B
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<b>Prepared by</b>	Mat Collins, Associate Transportation Engineer
<b>Reviewed by</b>	Ann-Marie Head, Associate Director - Transportation Engineering

## 1. Summary

Abley Limited (Abley) was engaged by Timaru District Council (Council) to provide independent transport planning advice in respect of the Timaru Proposed District Plan (PDP). The purpose of this technical note is to provide our commentary on transport related submissions on the notified PDP.

This technical note has been jointly authored by Ann-Marie Head and Mat Collins. As such the technical note uses “we”, and we confirm that we both support all opinions expressed in this technical note.

We have grouped submissions under topics and provided a summary of our recommendations in Table 1.1.

**Table 1.1 Summary of recommendations**

Topic	Submission reference	Albey recommendation
Definitions – Vehicle Parking Area	66.11	We recommend that this submission may be accepted in part, and if so, consequential changes to TRAN-R6, TRAN-R9, and TRAN-S4 will be required.  We recommend rejecting request to delete reference to buildings.
Definitions – Urban Area	171.19	We recommend that TRAN-S2 Table 8 and TRAN-S13 are amended to reference <i>Open Space Zones that are within or share a boundary with a rural zone</i> , and <i>Open Space Zones that are not within or do not share a boundary with the rural zone</i> .
Definitions – Regionally Significant Infrastructure	42.2	We recommend that definition of Regionally Significant Infrastructure include National Routes and Regional Arterials, and District Arterials to align with SCHED1 and the Transport Chapter. We recommend that Council’s Planner consider whether Principal Roads should be included in the definition of Regionally Significant Infrastructure.



Topic	Submission reference	Albey recommendation
TRAN-P1 Active transport	174.21, 191.21, 249.21, 250.21, 251.21, and 252.21	We recommend that these submissions are rejected.
TRAN-P3 Existing land transport infrastructure	143.41	We recommended this submission is accepted.
TRAN-P5 Road classification	229.3	We recommended this submission is accepted.
TRAN-P8 Parking, loading and manoeuvring	174.22, 191.22, 249.22, 250.22, 251.22, and 252.22	We recommend that these submissions are rejected.
	229.33	We recommend that submission 229.33 is accepted in part. We have recommended alternative wording for TRAN-P8.1 to address the submitters requested relief. We recommend that the submitters requested relief for TRAN-P8.4 is rejected.
TRAN-P9 Non- transport related activities	143.47	We recommend that this submission is accepted in part. We have recommended alternative wording for TRAN-P9 to address the submitter's requested relief.
TRAN-R3 New vehicle accessway	143.49	We recommend this submission is accepted. Further, we recommend that TRAN-R3 and TRAN-R4 are amended such that they apply when a change of land use or expanded activity is proposed.
TRAN-R10 High trip generating activities	42.27	We agree with the submitter's request to include a high trip generator threshold for heavy vehicle movements. We consider that this is best addressed via a new Rule, rather than making amendments to TRAN-R10 and TRAN-S20. We have provided two options for the rule, one based on percentage increase in heavy vehicle movements (as requested by the submitter), and an alternative based on an absolute increase in heavy vehicle movements. In preparing these rules we have relied on the evidence of GeoSolve.
TRAN-S2 Road design requirements	66.23	We recommend that this submission is accepted.
TRAN-S5 Cycle parking provision	165.42	We recommend that this submission is accepted in part. We consider that a site specific exclusion from TRAN-S5 can be approved, however we recommend that the request to exclude the SRIZ from TRAN-S5 is rejected.
TRAN-S7 Minimum loading space requirements	165.43	We recommend that this submission is rejected.
TRAN-S9 Approach sight triangles for public road/rail level crossings	187.42	We recommended that this submission is accepted.
TRAN-S10 Vehicle access way requirements	27.3, 174.25, 191.25, 249.25, 250.25, 251.25, and 252.25	We recommend that the requested amendments to TRAN-S10.2 are accepted, and amendments to TRAN-S10.3 and TRAN-S10.4 are rejected.
	131.7	We support the relief sought by submission 131.7, however, we recommend that Council's Planner consider how this should be incorporated into the PDP.



Topic	Submission reference	Albey recommendation
	229.36	We recommend this submission is accepted in part. We accept the change to a 3.5m minimum vehicle accessway formed width for 3-9 parking spaces. However, we recommend the addition of a row in Table 15 for 10+ parking spaces is rejected and instead this is identified as an activity that Council has discretion over rather than providing a permitted pathway.
TRAN-S12 Minimum sight distance from vehicle crossings	143.59	We recommend that this submission is accepted in part. We have proposed alternative wording to TRAN-S12 to address the relief sought.
TRAN-S15 Minimum distance between vehicle crossings	143.61	We recommended that this submission is accepted.
TRAN-S17 Vehicle crossings onto roads with 70km/h or greater posted speed limits	143.63	We recommended that this submission is accepted.
	174.26, 191.26, 249.26, 250.26, 251.26, and 252.26	We recommend that these submissions are rejected.
TRAN-S18 Reverse manoeuvring	42.29	We recommended that this submission is accepted.
TRAN-S19 Lighting of parking and manoeuvring	174.27, 191.27, 249.27, 250.27, 251.27, and 252.27	We recommend that these submissions are accepted and that Council's Planner consider whether amendments to the PDP are required.
TRAN-S20 High Trip Generating Activities	165.44	We recommend that this submission is rejected.
	42.28	Refer to our discussion of this matter in response to Submission 42.27.
	106.9	We recommend that this submission is rejected.
	116.9	We recommend that this submission is accepted in part. We have proposed alternative wording to TRAN-R10 to address the relief sought.
	196.42	We recommend that this submission is rejected, as our recommended change to TRAN-R10 achieves the intent of the relief sought.
	242.15	We recommend that Council's Planner consider whether the PDP definition for Supermarket requires amendment. We recommend that Council reject the amendments sought for Table 21.
SCHED1	42.69	We recommend that Road 5 of the DEV 3 - Washdyke Industrial Development Area Plan is identified as a Principal Road.  We recommend that road hierarchy change requests for Falvey Road, Levels Plain Road, and Brosnan Road are rejected.
	165.6	We recommend that this submission is accepted.



Topic	Submission reference	Albey recommendation
	174.95	We recommend that this submission is rejected.
	167.49	We recommend that DEV 1 - Broughs Gully Development Area Plan Road 1 is classified in SCHED1 as a Collector Road.

## 2. Definitions

### 2.1 Submission 66.11

Bruce Speirs seeks to amend the definition of Vehicle Parking Area as follows:

***Vehicle Parking ~~and~~ Manoeuvring Area***

*means that part of a site ~~or building~~ within which vehicle parking and manoeuvring are accommodated'.*

While the notified definition includes “*manoeuvring*”, we consider that the requested relief could be adopted to improve clarity. This would require consequential changes to TRAN-R6, TRAN-R9, and TRAN-S4, where the term “*Vehicle Parking Area*” is used.

We disagree with the request to delete “or building” as some parking and manoeuvring areas may be within buildings (for example basement parking, parking buildings etc).

**Outcome: We consider that submission 66.11 may be accepted in part, and if so, consequential changes to TRAN-R6, TRAN-R9, and TRAN-S4 will be required. We recommend that the submitters requested to delete reference to buildings is rejected.**

### 2.2 Submission 171.19

Fenlea Farms Limited seeks clarification of the Urban Area, and Council’s Planner has identified that defining “Urban Area” presents some challenges. TRAN-S2 Table 8 and TRAN-S13 refer to the Urban Area, and therefore we have considered whether there is a need for the definition.

In the Transport Chapter, references to the Urban Area are associated with the Open Space Zone (OSZ). The Proposed District Plan (PDP) describes the OSZ as including neighbourhood parks, natural areas, and amenity parks, which typically feature landscaping and low-density development. Cemeteries, which are quiet, contemplative spaces, are also part of this zone. Since the OSZ can exist in both urban and rural contexts, we believe it is important for TRAN-S2 Table 8 and TRAN-S13 to distinguish between these two settings, as the road environment and user experience will vary.

However, we consider that the following wording can be adopted in TRAN-S2 Table 8 and TRAN-S13 to avoid needing to define “Urban Area”:

- Open Space Zones that are within or share a boundary with a rural zone
- Open Space Zones that are not within or do not share a boundary with the rural zone.

**Outcome: In reference to submission 171.19, we recommend that TRAN-S2 Table 8 and TRAN-S13 are amended to reference Open Space Zones that are within or share a boundary with a rural zone, and Open Space Zones that are not within or do not share a boundary with the rural zone.**



## 2.3 Submission 42.2

Timaru District Council seeks to amend the definition of Regionally Significant Infrastructure, so that National Routes and Principal Roads are specified, as follows:

*Regionally Significant Infrastructure is:*

- a. ~~Strategic land transport network~~ National Routes, Principal Roads, and arterial roads

We note the following definitions in other Canterbury based plans:

- Canterbury Regional Policy Statement 2013 defines Regionally Significant Infrastructure as “main highways and roads”
- Christchurch District Plan defines Strategic Road Network as “state highways and major arterial roads”
- Partially Operative Selwyn District Plan defines Strategic Transport Network as including “State Highways and Arterial Roads”
- Proposed Waimakariri District Plan defines Regionally Significant Infrastructure as “strategic land transport network and arterial roads”.

The PDP does not define “Strategic Land Transport Network”, we therefore recommend that the definition of Regionally Significant Infrastructure is updated to match the Roding Hierarchy defined in SCHED1 and terminology used in the Transport Chapter.

We recommend the following:

*Regionally Significant Infrastructure is:*

- b. ~~Strategic land transport network and arterial roads~~ National Routes, Regional Arterials, and District Arterials.

Regarding Principal Roads, as the Transport Chapter does not reference Regionally Significant Infrastructure, including Principal Roads in the definition will not affect the application of the Transport Chapter. However, as the definition of Regionally Significant Infrastructure features in other District Plan Chapters and has an impact on consenting pathways, we recommend that Council’s Planner consider whether the definition of Regionally Significant Infrastructure should include Principal Roads.

**Outcome: We recommend that definition of Regionally Significant Infrastructure include National Routes and Regional Arterials, and District Arterials to align with SCHED1 and the Transport Chapter. We recommend that Council’s Planner consider whether Principal Roads should be included in the definition of Regionally Significant Infrastructure.**

## 3. TRAN-P1 Active transport

### 3.1 Submissions 174.21, 191.21, 249.21, 250.21, 251.21, and 252.21

Rooney Holdings Limited and multiple other similar submissions (submissions 191.21, 249.21, 250.21, 251.21, and 252.21) seek amend TRAN-P1.5 as follows:

5. ~~requiring encouraging~~ secure, sheltered cycle parking that is located in a convenient and safe position and which ensures pedestrian safety; and...

TRAN-S6.4, states that long term parking must be located in a covered and secure area. Therefore, it would be inconsistent to amend TRAN-P1.5 to not be directive.

**Outcome: We recommend that submissions 174.21, 191.21, 249.21, 250.21, 251.21, and 252.21 are rejected.**



## 4. TRAN-P3 Existing land transport infrastructure

### 4.1 Submission 143.41

Waka Kotahi NZ Transport Agency seeks to amend TRAN-P3 as follows:

*Enable the **safe and** efficient use of the existing land transport infrastructure by providing for its operation, maintenance and upgrading.*

We support this relief as safety is a key outcome sought for the transport network, and is consistent with TRAN-O1 Safe, efficient, integrated and sustainable land transport infrastructure.

**Outcome: We recommended that submission 143.41 is accepted.**

## 5. TRAN-P5 Road classification

### 5.1 Submission 229.3

Kāinga Ora seeks to amend TRAN-P5 as follows:

*Require the District's roads to be classified and built according to their anticipated function and maintained to enable land transport infrastructure to operate **safely and** effectively.*

We support this relief as safety is a key outcome sought for the transport network, and is consistent with TRAN-O1 Safe, efficient, integrated and sustainable land transport infrastructure.

**Outcome: We recommended that submission 229.3 is accepted.**

## 6. TRAN-P8 Parking, loading and manoeuvring

### 6.1 Submissions 174.22, 191.22, 249.22, 250.22, 251.22, and 252.22

Rooney Holdings Limited and multiple other similar submissions (submissions 249.22, 250.22, 251.22, and 252.22) seek to delete TRAN-P8.3, stating that this duplicates the Building Act 2004.

We note the following Canterbury based plans include reference to safe access for pedestrians within sites:

- Partially Operative Selwyn District Plan
  - *TRAN-P6.4 provide for the interaction between vehicle access and manoeuvring, loading and parking areas when determining on-site pedestrian and cycling routes*
- Proposed Waimakariri District Plan
  - *TRAN-O2: Parking, where provided, loading area and associated access and manoeuvring area that:... is accessible and convenient for pedestrians;*
  - *TRAN-P10: Ensure safe pedestrian movement within and adjacent to parking and associated manoeuvring area by providing:*
    1. *pedestrian routes that provide safe separation from vehicle movements and which are unimpeded by vehicles;*
    2. *visibility between vehicles and pedestrians; and*
    3. *pedestrian routes that are designed and constructed to be accessible.*

We are unable to comment on duplication of the Building Act 2004, as this is not our expertise, however in our opinion it would be inappropriate to delete references to safe access for pedestrians and cyclists. Further, we note that TRAN-R6, TRAN-S8 and TRAN-S11 include discretion over pedestrian safety and efficiency within vehicle parking areas, which supports the retention of TRAN-P8.3.



Crime Prevention through Environmental Design (CPTED) is a matter of consideration in policies and rules for car parking areas in the Town Centre and City Centre Zones. In particular, policies TCZ-P3.2d and CCZ-P4.7b with TCZ-R9 and CCZ-R8 supporting these policies. This is appropriate given the public will have access to car parking areas in these zones. Within the Transport Chapter, for vehicle parking areas in the General Rural Zone, CPTED is included as a matter of discretion for car parks greater than 20 parking spaces and that meet the transport standards. Hence, we consider that retaining the reference to CPTED in TRAN-P8 is appropriate.

**Outcome: We recommended that submissions 174.22, 191.22, 249.22, 250.22, 251.22, and 252.22 are rejected.**

## 6.2 Submission 229.33

Kāinga Ora seek to amend TRAN-P8 as follows:

1. *efficient, effective and safe servicing ~~and vehicle manoeuvring facilities on-site~~, including for emergency service vehicles;*
- ....
4. *landscaping ~~is~~ provided in large parking areas that visually softens the dominant effect of hard surfaces and positively contributes to amenity values.*

Kāinga Ora considers that not all sites will require vehicle loading and that landscaping is only provided for large parking areas.

We support the relief sought by Kāinga Ora for TRAN-P8.1, however we have provided alternative wording which we consider achieves the outcome sought by Kāinga Ora while still providing a link to Transport Rules and Standards relating to site vehicle access and manoeuvring:

1. *efficient, effective and safe servicing and vehicle manoeuvring facilities on-site (where provided), including for emergency service vehicles;*

We do not support the relief sought by Kāinga Ora for TRAN-P8.4, as we understand there is no definition in the PDP for “large parking areas”. In our view TRAN-S1 clearly states that landscaping is required where five or more at grade parking spaces are provided for non-residential activities, which provides the context to support the notified version of TRAN-P8.4.

**Outcome: We recommend that submission 229.33 is accepted in part. We have recommended alternative wording for TRAN-P8.1 to address the submitters requested relief. We recommend that the submitters requested relief for TRAN-P8.4 is rejected.**

## 7. TRAN-P9 Non-transport related activities

### 7.1 Submission 143.47

Waka Kotahi NZ Transport Agency supports the co-location of network activities within the road corridor, however it raises concerns about enabling non-transport related activities within the state highway corridor. Waka Kotahi NZ Transport Agency seeks the following amendment:

*Encourage the road (excluding any state highway) and railway corridor to be used for:*

.....

We support the intent of this relief as Waka Kotahi NZ Transport Agency is responsible for managing the State Highway network and has separate asset owner processes for considering third party activities within its assets. However, the relief sought would also exclude network utilities, which it appears is not Waka Kotahi NZ Transport Agency’s intent.





We have provided alternative wording which we consider achieves the outcome sought by Waka Kotahi NZ Transport Agency while still enabling network utilities within the state highway corridor

Encourage the road and railway corridor to be used for:

1. Other co-located network utilities;
2. Non-transport related activities which contribute to public amenity values and well-being (excluding in any state highway or railway corridor) while:

.....

**Outcome: We recommend that submission 143.47 is accepted in part. We have recommended alternative wording for TRAN-P9 to address the submitters requested relief.**

## 8. TRAN-R3 New vehicle accessway

### 8.1 Submission 143.49

Waka Kotahi NZ Transport Agency recommends that a link is provided between TRAN-R3 and TRAN-R4, as consent could be sought for a vehicle accessway using an existing vehicle crossing. The submission seeks to include compliance with TRAN-S12, TRAN-S14, TRAN-S15, and TRAN-S16 in TRAN-R3.

We support the intent of this relief, as there is currently no provision within the PDP to assess the adequacy of an existing vehicle crossing (or vehicle accessway) when consent for a change or expansion of an existing land use activity is sought on a site.

In our view it may be more appropriate to amend TRAN-R3 and TRAN-R4 to delete the word “New” from the Rule name. This would allow the Rules to be considered for existing vehicle accessways and vehicle crossings that were proposed to be used for a different land use or expanded activity than what they were originally consented for.

**Outcome: We recommend that submission 143.49 is accepted. Further, we recommend that TRAN-R3 and TRAN-R4 are amended such that they apply when a change of land use or expanded activity is proposed.**

## 9. TRAN-R10 High trip generation activities

### 9.1 Submission 42.27

Timaru District Council seeks to amend TRAN-R10 RDIS-1.1 and RDIS-1.2 to include a matter of discretion referencing APP7-Financial Contribution where increases in heavy vehicle traffic by an activity has potential to generate adverse effects on the road network. The submitter also seeks consequential amendments to TRAN-S20.

At our request, Timaru District Council engaged GeoSolve, a Pavement Engineering Consultant, to analyse and provide evidence of pavement effects at a district-wide level. GeoSolve’s findings are summarised in their report (Timaru District Council Pavement Modelling, dated 26 November 2024), attached to our memo (refer to Appendix A). Abley do not employ any pavement experts and therefore cannot peer review this information. The Council has engaged an independent peer reviewer, whose review is currently underway. Therefore, our recommendations are based solely on GeoSolve’s evidence.

The GeoSolve modelling highlights:

- 6.8% of Council roads are vulnerable to a 5% increase in heavy vehicle movements (refer Table 4 of the GeoSolve report).



- 7% to 31% of Council roads are vulnerable to an increase of 5 additional heavy vehicle movements per day (refer Table 1 of the GeoSolve report).
- 27% to 48% of Council roads are vulnerable to an increase of 100 additional heavy vehicle movements per day (refer Table 1 of the GeoSolve report).
- Rural roads are more vulnerable than urban roads, although some urban roads are also at risk (refer Figures 1, 3, and Table 3 of the GeoSolve report).
- Lower-volume roads are more impacted than higher-volume roads (refer Figures 2, 4, and Table 3 of the GeoSolve report).

The GeoSolve evidence also notes that High Productivity Motor Vehicles<sup>1</sup> (HPMV) which exceed standard Class 1 individual axle, axle set and combined axle set load limits as defined by NZTA<sup>2</sup> can have an exponential impact on pavements.

GeoSolve recommends requiring a Pavement Impact Assessment for developments expected to generate:

- Heavy vehicle traffic that exceeds 5% of current heavy vehicle traffic on affected roads; or
- Traffic involving HPMVs with non-standard axle loadings exceeding NZTA Class 1 limits.

We raised concerns about the practicality of requiring applicants to determine a percentage increase in heavy vehicle traffic without conducting traffic surveys. Such surveys could impose unreasonable costs on resource consent applications. However, Suzy Ratahi, Council's Land Transport Manager, confirmed that Council maintains a database of heavy vehicle movements and that this will be made publicly accessible, thereby addressing our concern.

As an alternative to the percentage increase method sought in Council's submissions, we discussed whether an absolute threshold could be used as it may be easier for Plan users to apply. GeoSolve's modelling shows that 7% to 31% of Council roads are vulnerable to an increase of 5 additional heavy vehicle movements per day, supporting this approach.

We asked GeoSolve to consider whether urban roads could be excluded from the assessment of pavement impacts, however the GeoSolve assessment shows that urban roads are vulnerable to heavy vehicle movements.

We also considered whether to exclude specific road categories from the assessment. GeoSolve's findings indicate:

- All urban roads cannot be excluded, as some are still vulnerable.
- Higher-order roads (e.g., Arterials and Regional routes) are generally more resilient, but lower-order roads remain significantly vulnerable.

GeoSolve used the NZTA One Road Network Classification (ONRC) for its hierarchy, while the PDP uses a different classification. Suzy Ratahi clarified that ONRC's "Primary Collector" corresponds to the PDP's "Principal Road," and multiple Principal Rural Roads are vulnerable to heavy vehicle increases.

Based on this, we recommend excluding Principal Roads in urban areas, as well as District and Regional Arterials and State Highways, from the requirement for pavement impact assessments.

We have prepared two potential rule options to address heavy vehicle impacts on pavements:

- A rule based on a percentage increase in heavy vehicle movements (as requested by the submitter).
- An alternative rule based on an absolute increase in heavy vehicle movements.

**Outcome: We agree with the submitter's request to include a high trip generator threshold for heavy vehicle movements. We consider that this is best addressed via a new Rule, rather than**

<sup>1</sup> <https://www.nzta.govt.nz/commercial-driving/high-productivity/>

<sup>2</sup> <https://www.nzta.govt.nz/vehicles/vehicle-types/vehicle-classes-and-standards/vehicle-dimensions-and-mass/>



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**making amendments to TRAN-R10 and TRAN-S20. We have provided two options for the rule, one based on percentage increase in heavy vehicle movements (as requested by the submitter), and an alternative based on an absolute increase in heavy vehicle movements. In preparing these rules we have relied on the evidence of GeoSolve.**



Option 1 – percentage increase rule

TRAN-Rxx	Heavy vehicle trip generation activities	
All Zones	<p><b>Activity status: Restricted Discretionary</b></p> <p><b>Where:</b></p> <p><b>RDIS-1</b> Any use or development that generates heavy vehicle movements on any Collector Road or Local Road, or any Principal Road that shares a boundary with a Rural zone, that meet or exceed a 5% increase in annual average daily heavy vehicle movements on that Road.</p> <p><b>RDIS-2</b> Any use or development that generates any high productivity motor vehicles (HPMV) movements with non-standard axle loadings exceeding NZTA class 1 axle limits on any Collector Road or Local Road, or any Principal Road that shares a boundary with a Rural zone.</p> <p><b>Matters of discretion are restricted to:</b></p> <ol style="list-style-type: none"> <li>1. Pavement impacts having particular regard to the level of additional traffic generated by the activity and the extent to which measures are proposed to adequately mitigate the effects on the road marginal cost.</li> <li>2. APP7 – Financial Contribution.</li> </ol> <p><b>Notes:</b></p> <p>This rule does not apply to heavy vehicle movements generated on State Highways, Regional Arterials, District Arterials, or Principal Roads that do not share a boundary with a Rural zone.</p> <p>If a Pavement Impact Assessment has already been approved for the site as part of a granted resource consent, then these rules do not apply to any development that is within the scope of that Pavement Impact Assessment and in accordance with the resource consent, unless the resource consent has lapsed.</p> <p>Timaru District Council maintains a database of heavy vehicle movements on all Council Roads. This data can be accessed on Council’s website <a href="#">LINK TO BE INSERTED TO COUNCIL DATA</a>.</p> <p>Guidance on preparing a pavement impact assessment is provided in the Queensland Guide to Traffic Impact Assessment and Queensland Pavement Impact Assessment Practice Note.</p> <p>Road marginal cost is a cost per 100m segment of road derived over a 50-year cycle of road costings (including maintenance, rehabilitation and reconstruction).</p>	<p><b>Activity status when compliance not achieved: Not applicable</b></p>



**Option 2 – absolute increase rule**

TRAN-Rxx	Heavy vehicle trip generation activities	
All Zones	<p><b>Activity status: Restricted Discretionary</b></p> <p><b>Where:</b></p> <p><b>RDIS-1</b> Any use or development that generates heavy vehicle movements on any Collector Road or Local Road, or any Principal Road that shares a boundary with a Rural zone, that meet or exceed 5 annual average daily heavy vehicle movements on that Road.</p> <p><b>RDIS-2</b> Any use or development that generates any high productivity motor vehicles (HPMV) movements with non-standard axle loadings exceeding NZTA class 1 axle limits on any Collector Road or Local Road, or any Principal Road that shares a boundary with a Rural zone.</p> <p><b>Matters of discretion are restricted to:</b></p> <ol style="list-style-type: none"> <li>1. Pavement impacts having particular regard to the level of additional traffic generated by the activity and the extent to which measures are proposed to adequately mitigate the effects on the road marginal cost.</li> <li>2. APP7 – Financial Contribution.</li> </ol> <p><b>Notes:</b></p> <p>This rule does not apply to heavy vehicle movements generated on State Highways, Regional Arterials, District Arterials, or Principal Roads that do not share a boundary with a Rural zone.</p> <p>If a Pavement Impact Assessment has already been approved for the site as part of a granted resource consent, then these rules do not apply to any development that is within the scope of that Pavement Impact Assessment and in accordance with the resource consent, unless the resource consent has lapsed.</p> <p>Timaru District Council maintains a database of heavy vehicle movements on all Council Roads. This data can be accessed on Council’s website <a href="#">LINK TO BE INSERTED TO COUNCIL DATA</a>.</p> <p>Guidance on preparing a pavement impact assessment is provided in the Queensland Guide to Traffic Impact Assessment and Queensland Pavement Impact Assessment Practice Note.</p> <p>Road marginal cost is a cost per 100m segment of road derived over a 50-year cycle of road costings (including maintenance, rehabilitation and reconstruction).</p>	<p><b>Activity status when compliance not achieved: Not applicable</b></p>



## 10. TRAN-S2 Road design requirements

### 10.1 Submission 66.23

Bruce Speirs seeks to amend a reference to Figure 5. The submitter considers that this should instead reference Figure 6. We agree that the Figure has been incorrectly referenced.

**Outcome: We recommend that submission 66.23 is accepted.**

## 11. TRAN-S5 Cycle parking provision

### 11.1 Submission 165.42

Fonterra Limited is seeking to apply a new zoning designation, the Strategic Rural Industry Zone (SRIZ), to its land holdings in Clandeboye.

Fonterra proposes that sites designated as SRIZ be exempt from TRAN-S5, citing their isolated nature. Under the notified PDP, new activities at Fonterra's sites would likely be classified as Industrial Activities, requiring the provision of one long-term cycle park per 1,000m<sup>2</sup> of GFA, with a minimum of two spaces, as outlined in TRAN Table 12.

We acknowledge that Clandeboye is relatively isolated, being about 13 km from Temuka, the nearest urban development, and that demand for cycle parking is likely to be low. Therefore, we agree that the Clandeboye site can be excluded from the requirements of TRAN-S5.

However, should other locations be zoned SRIZ in the future, we recommend not applying a blanket exemption for the SRIZ. In areas with higher accessibility, there may still be a need for long-term cycle parking.

We note that the Whangarei District Plan includes an SRIZ, and the Fonterra Kauri Milk Processing Site, which is zoned SRIZ, but not the whole SRIZ is exempt from providing cycle parking (as per Table TRA-1C of the Whangarei District Plan). We recommend adopting a similar approach in the Timaru PDP.

**Outcome: We recommend that submission 165.42 is accepted in part. We consider that a site specific exclusion from TRAN-S5 can be approved, however we recommend that the request to exclude the SRIZ from TRAN-S5 is rejected.**

## 12. TRAN-S7 Minimum loading space requirements

### 12.1 Submission 165.43

Fonterra Limited is seeking to apply the SRIZ to its land holdings in Clandeboye. Fonterra has also requested that sites zoned as SRIZ be exempt from TRAN-S7, arguing that their operational requirements, including loading spaces, are inherently accommodated on these sites.

Under the notified PDP, new activities at Fonterra's sites, classified as Industrial Activities, would be required to provide one heavy vehicle bay per 2,000m<sup>2</sup> GFA to accommodate at least an 11.5m truck, as outlined in TRAN Table 13.

We recommend rejecting the requested relief, as it is important for the Council to retain discretion over the provision of loading spaces, regardless of the submitter's assumption that these will be inherently included on their sites.

Additionally, we note that the Whangarei District Plan, which includes an SRIZ, does not exempt the zone from providing loading spaces (as per TRA Appendix 1C of the Whangarei District Plan). Our recommendation aligns with this approach.



**Outcome: We recommend that submission 165.43 is rejected.**

## 13. TRAN-S9 Approach sight triangles for public road/rail level crossings

### 13.1 Submission 187.42

KiwiRail Holdings Limited seeks to amend TRAN-S9 as follows:

**TRAN-S9 Rail level crossing sightlines and vehicle crossing setbacks Approach sight triangles for public road/rail level crossings**

1. Any vehicle access way and vehicle crossing must not cross a railway line and any vehicle crossing must not be located less than 30 metres from a rail level crossing. The 30 metres shall be measured from the edge of the closest rail track to the edge of seal on the proposed vehicle access point.
2. Any building, structure ~~or~~ planting or other visual obstruction must not be located within the ~~shaded restart or approach sightline~~ areas of a rail level crossing as shown in the shaded areas as identified in Figure 7 or Figure 8 below.

**Figure 7 - level crossings controlled by Stop or Give Way control Approach sight triangles for level crossings with Give Way signs**

We consider that these amendments improve the clarity of TRAN-S9 and recommend that they are adopted.

**Outcome: We recommend that submission 187.42 is accepted.**

## 14. TRAN-S10 Vehicle access way requirements

### 14.1 Submission 174.25, 191.25, 249.25, 250.25, 251.25, and 252.25

Rooney Holdings Limited and multiple other similar submissions (submissions 191.25, 249.25, 250.25, 251.25, and 252.25) seek to amend TRAN-S10(2) as follows:

- TRAN-S10.2 - Reduce the sealing requirement from 20m to 5 metres from the existing seal formation regardless of the distance to the road boundary, and not require sealing where the road is unsealed.
- TRAN-S10.3 - amend to promote the access to the secondary road as the principal consideration but provide for access to the primary road as an alternative where there are no resulting adverse effects.
- TRAN-S10.4 – amend to specify a combined passing bay and carriageway width of 5.5 metres.

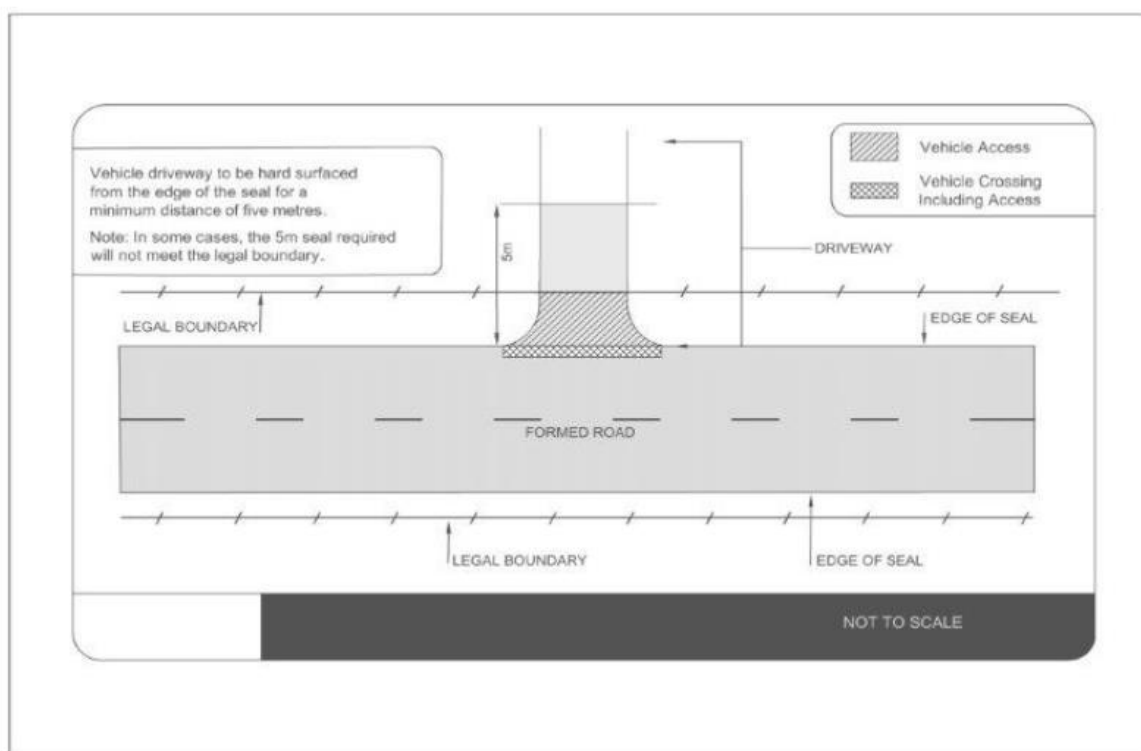
#### TRAN-S10.2

Regarding the requirement for accessway sealing, we note the following plans include:

- Partially Operative Selwyn District Plan
  - *TRAN-REQ6 All Zones: 1. Vehicle crossings where they adjoin a sealed carriageway shall be sealed for the full width and length of the vehicle crossing between the carriageway and the site boundary.*
  - *Various requirements for accessways to be sealed, however there are no sealing requirements in Rural zones*

- Proposed Waimakariri District Plan
  - *TRAN-R12 All Zones.*
  - *Various requirements for accessways to be sealed or to vehicle traffic spreading loose gravel onto an adjoining sealed road. Sealing is not required where vehicle access is obtained from an unsealed road.*
- Christchurch District Plan
  - *Rule 7.4.3.6*
  - *Various requirements for accessways to be sealed however there are no sealing requirements where access is obtained from an unsealed road.*
- Dunedin 2<sup>nd</sup> Generation District Plan
  - *Rule 6.6.3.6a*
  - *Driveways that adjoin a legal road that is hard surfaced, must be constructed with a hard surface for a minimum distance of 5m from the edge of the road (See Appendix 6B, Figure 6B.19 – reproduced below).*
  - *In all zones other than the rural and rural residential zones, the full length of any driveway that serves 2 or more residential properties must be hard surfaced.*

Figure 6B.19 Vehicle driveway surfacing diagram



The purpose of the sealing requirement is to ensure debris is not dragged onto the road which could cause a safety hazard due to loss of traction. This does not apply where the road is unsealed. The district plans noted above recognise these situations and it is recommended the Timaru TRAN S-10 reflect this consideration.





Where accessways do need to be sealed as they connect to a sealed road, the other plans suggest a distance of 5 or 6m back from the edge of the road seal as this is considered sufficient distance to avoid debris from being dragged onto the road. It is recommended TRAN-S10 be modified to reflect this.

### TRAN-S10.3

We consider that the notified PDP already provides the opportunity for vehicle access to be from the Primary Road, when a site has frontage to both a Primary and Secondary Road. In such a situation an applicant can seek consent for this, with Council having discretion over potential safety and efficiency effects. We therefore recommend that the requested relief is rejected.

### TRAN-S10.4

We agree with the submitter's interpretation that the 5.5m width of the passing bay is the full width required, i.e. the passing bay width is not additive to the minimum vehicle access way formed width. In our opinion the notified PDP is clear, and amendments are not required.

**Outcome: Regarding submissions 174.25, 191.25, 249.25, 250.25, 251.25, and 252.25, we recommend that the requested amendments to TRAN-S10.2 are accepted, and amendments to TRAN-S10.3 and TRAN-S10.4 are rejected.**

## 14.2 Submission 27.3

Andrew Scott Rabbidge, Holly Renee Singline and RSM Trust Limited seek to delete TRAN-S10.2, as in the submitters view this is excessive. Refer to our discussion of the relief sought by Rooney Holdings Limited (submission 174.25).

## 14.3 Submission 131.7

Fire and Emergency New Zealand (submission 131.7) seeks to amend TRAN-S10 to include consideration of fire appliance access. It seeks amendments as follows:

### *Table 15 - Vehicle access way requirements*

...

**\*\*\* The vehicle access point complies with the dimensions required for fire appliances for developments in SNZ PAS 4509:2008 New Zealand Fire Service Firefighting Water Supplies Code of Practice where a driveway length exceeds 75m or a fire appliance is not able to reach the source of a firefighting water supply from a public road.**

Fire and Emergency New Zealand vehicle access requirements were recently discussed as part of Auckland Council's Plan Change 79. The Decision recommended including a reference to emergency responder access "Note", as we understand there was some concern about duplicating the requirement of other documents (such as the Building Code and/or Fire and Emergency New Zealand guidelines). The Decision recommended the following "Note":

### *E27.6.4.3 Width of vehicle access, queuing and speed management requirements*

.....

#### *Note 1*

.....

*Emergency responder access requirements are further controlled by the Building Code. Plan users should refer to the Building Code to ensure compliance can be achieved at building consent stage. Granting of a resource consent does not imply that waivers of Building Code*



requirements will be granted. Fire and Emergency New Zealand publishes guidance in the context of Building Code requirements<sup>3</sup>.

We agree with the outcome that the District Plan makes reference to emergency responder access. However, we are unsure whether the District Plan should reference SNZ PAS 4509:2008 New Zealand Fire Service Firefighting Water Supplies Code of Practice (published by Fire and Emergency New Zealand), Building Code requirements, or some other Code, Standard or Guideline, and whether this should be included as a Standard or as a Note.

**Outcome: We support the relief sought by submission 131.7, however, we recommend that Council’s Planner consider how this should be incorporated.**

#### 14.4 Submission 229.36

Kāinga Ora seeks clarification for TRAN-S10. The submitter considers that the formation requirements for more than 3-9 residential units is overly prescriptive and may inhibit further residential intensification. Further, it considers the note which states that ‘vehicle access ways where 10 or more parking spaces are provided, should be vested as a road’ does not appear to link to an equivalent rule for road vesting.

Kāinga Ora seeks the following amendments to Table 15:

**Table 15 - Vehicle access way requirements**

Zone	Development served	Minimum vehicle access width	Minimum vehicle access way formed width	Maximum length	Maximum gradient**
Residential Zones	1 to 2 parking spaces	3.5m**	2.7m	No limit	1:5 (20%)
	3 to 9 parking spaces*	5m	<del>4m</del> -3.5m	No Limit	
	<u>10+parking spaces</u>	<u>6.5m</u>	<u>4.5m</u>	<u>No Limit</u>	

We have reviewed whether it is appropriate to have a rule that limits private ways to serving no more than 10 spaces, with the implication being that private accessways that serve more than 10 spaces need to be vested in Council as road. From our review of other district plans across New Zealand, we have found that there is no common approach to limiting the number of car parking spaces or units accessed from a private way.

The key transportation issues with accessways that service a high number of car parks associated with residential development include:

- Whether the accessway would otherwise provide connectivity for the transport network, therefore potentially being in the public interest to be vested as a public road. The potential for this is greater as the scale of development accessed from an accessway increases.

<sup>3</sup> Auckland Plan Change 79 Decision, available online at <https://www.aucklandcouncil.govt.nz/UnitaryPlanDocuments/pc-79-decision.pdf>



- Whether the design of the accessway is suitable to accommodate the transport demands associated with a higher number of car parks. In addition to vehicle traffic demands, this is likely to include pedestrian and cyclist demands which are not accounted for in the standard as drafted (nor the suggested amendments proposed by Kainga Ora).
- Whether the accessway will adequately accommodate rubbish collection and servicing requirements
- Whether there is sufficient lighting on the accessway.

Although the above issues generally become of greater concern as the number of car parks serviced by an accessway increases, we note that there are occasions where it is appropriate for a private access way to service more than 10 car parking spaces, for example, a medium to high density residential development with a common car parking area. Scenarios such as those are typically not well suited to road vesting, as well as achieving the road design standards that are attached to vesting, but are rather best considered on a case by case basis. Similarly, there may be greenfield subdivision accesses that service more than 10 car parks that are appropriately designed as private roads. For example, this may include a relatively small scale subdivision that does not provide any strategic transport link opportunities, and is able to accommodate an accessway design to an appropriate standard to meet transport demands, safety standards and servicing requirements.

We note similar submissions, including from Kāinga Ora, were made to the replacement Selwyn District Plan. The Section 42A report recommended that accessways serving 7-9 sites be treated as discretionary activities and more than 9 sites treated as non-complying activities<sup>4</sup>.

On this basis, we recommend that where residential accessways are proposed to service 10 or more car parks that council has discretion over the vehicle accessway design. This will enable Council to consider each application on a case by case basis and in particular whether access via a private way is an appropriate outcome from a transport perspective.

From a transport perspective, we agree that 3.5m minimum vehicle accessway formed width is appropriate for developments of 3 to 9 parking spaces, and support this aspect of the amendments from the submitter. In terms of fire and emergency access, refer to our response to submission 131.7.

**Outcome: We recommend that submission 229.36 is accepted in part. In particular, we accept the change to a 3.5m minimum vehicle accessway formed width for 3-9 parking spaces. Conversely we recommend the addition of a row in Table 15 for 10+ parking spaces is rejected and instead this is identified as an activity that Council has discretion over rather than providing a permitted pathway.**

## 15. TRAN-S12 Minimum sight distance from vehicle crossings

### 15.1 Submission 143.59

Waka Kotahi NZ Transport Agency seeks the following amendments, to provide consistency between the PDP and Waka Kotahi Policy Planning Manual - Appendix 5B (PPM):

1. Any vehicle crossing onto roads with equal to or greater than a 50km/h ~~60km/h~~ posted speed must comply with the minimum sight distance in Figure 12.

We support the intent of the requested relief, however we do not think it is appropriate to apply this sight line requirement on all urban roads. We suggest the following amendment to TRAN-S12.1.

<sup>4</sup> Proposed Selwyn District Plan s42a report (Transport), para 12.42 onwards, available online at [https://www.selwyn.govt.nz/data/assets/pdf\\_file/0005/497165/Councils-s42A-Transport-Report.pdf](https://www.selwyn.govt.nz/data/assets/pdf_file/0005/497165/Councils-s42A-Transport-Report.pdf)



1. Any vehicle crossing onto roads with greater than a 60km/h posted speed or onto any State Highway must comply with the minimum sight distance in Figure 12.

**Outcome: We recommend that submission 143.59 is accepted in part. We have proposed alternative wording to TRAN-S12 to address the relief sought.**

## 16. TRAN-S15 Minimum distance between vehicle crossings

### 16.1 Submission 143.61

Waka Kotahi NZ Transport Agency seeks the following amendments to Table 18 to correct inconsistencies with the Waka Kotahi Policy Planning Manual - Appendix 5B (PPM) for vehicle crossings onto State Highways:

**Table 18 - Minimum distance between vehicle crossings on same side of road**

Frontage road speed limit	Minimum distance between vehicle crossing <u>on Local, Collector, Regional Arterial, District Arterial and Principal.</u>	<u>Minimum distance between vehicle crossing on National Route</u>
70km/h	40m	<u>40m</u>
80km/h	70m	<u>100m</u>
90km/h	85m	<u>200m</u>
100km/h	105m	<u>200m</u>

We support this amendment, as any vehicle access onto a State Highway will require Waka Kotahi NZ Transport Agency approval, and therefore the PDP should be consistent with Waka Kotahi NZ Transport Agency asset owner requirements.

**Outcome: We recommend that submission 143.61 is accepted.**

## 17. TRAN-S17 Vehicle crossings onto roads with 70km/h or greater posted speed limits

### 17.1 Submission 143.63

Waka Kotahi NZ Transport Agency seeks the following amendments to Table 20.b to correct inconsistencies with the Waka Kotahi Policy Planning Manual - Appendix 5B (PPM) for vehicle crossings onto State Highways as follows:

**Table 20 - Vehicle crossings**

Daily Traffic Volumes using the vehicle crossing (ECMs*)	Is the vehicle crossing on a state highway?	Figure to use for vehicle crossing design
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b.	1 - 30	Yes	<p><i>Figure 16 (Vehicle crossing without shoulder widening)</i></p> <p><i>Figure 17 (Vehicle crossing with shoulder widening)</i></p>
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We support this amendment, as any vehicle access onto a State Highway will require Waka Kotahi NZ Transport Agency approval, and therefore the PDP should be consistent with Waka Kotahi NZ Transport Agency asset owner requirements.

**Outcome: We recommend that submission 143.63 is accepted.**

### 17.2 Submission 174.26, 191.26, 249.26, 250.26, 251.26, and 252.26

Rooney Holdings Limited and multiple other similar submissions (submissions 191.26, 249.26, 250.26, 251.26, and 252.26) are seeking that Gate Setback Distances, referred to in TRAN-S17, are specified.

Gate Setback Distances for the largest vehicle using the vehicle access are noted in Figure 16 and 17 of the PDP.

In our view TRAN-S17.1 is simple to apply and allows the vehicle crossing and gate design to be contextual depending on the likely type of use. For example a vehicle crossing for a single dwelling will likely only require a 11m Gate Setback Distance if there are only occasional heavy vehicles, whereas a stockyard may require a 20m Gate Setback Distance as the largest vehicle may be a truck and trailer unit.

**Outcome: We recommend that submissions 174.26, 191.26, 249.26, 250.26, 251.26, and 252.26 are rejected.**

## 18. TRAN-S18 Reverse manoeuvring

### 18.1 Submission 42.29

Timaru District Council (submission 42.29) seeks the following amendments to TRAN-S18 to control vehicle manoeuvring, as the submitter considers that the notified PDP seeks to control driver behaviour (which would be difficult to enforce):

1. Where vehicular access is from a National, or Regional, or District Arterial or Principal Road as identified in SCHED1 - Schedule of Roading Hierarchy, there must be sufficient space provided to ensure no reverse manoeuvring onto or off the road; and

We agree with the submitter and recommend that the relief is adopted.

**Outcome: We recommend that submission 42.29 is accepted.**

## 19. TRAN-S19 Lighting of parking and manoeuvring

### 19.1 Submission 174.27, 191.27, 249.27, 250.27, 251.27, and 252.27

Rooney Holdings Limited and multiple other similar submissions (submissions 191.27, 249.27, 250.27, 251.27, and 252.27) are seeking that TRAN-S19 be amended to exclude Light Sensitive Areas.

We agree with the submitter that any lighting of vehicle parking, loading and manoeuvring areas should consider Light Sensitive Areas. We note that TRAN-19 links to the Lighting Chapter and that LIGHT-O1 states that:



**LIGHT-O1**

*Artificial outdoor lighting is designed and located to minimise its adverse effects, is compatible with the character and qualities of the surrounding area and protects the values and characteristics of light sensitive areas.*

Therefore, the amendments to TRAN-S19 may not be required to provide the relief sought by the submitter.

**Outcome: We recommend that submissions 174.26, 191.26, 249.26, 250.26, 251.26, and 252.26 are accepted and that Council’s Planner consider whether amendments to other chapters of the PDP are required.**

## 20. TRAN-S20 High Trip Generating Activities

### 20.1 Submission 165.44

Fonterra Limited seeks to apply a new zoning, the Strategic Rural Industry Zone (SRIZ), to its land holdings in Clandeboye.

Fonterra seeks to exclude the SRIZ from TRAN-S20 (submission 165.44), and instead apply a zone specific provision. Fonterra proposes the following rule:

**SRIZ-R2 New buildings and additions to buildings**

<u>SRIZ-R2 New buildings and additions to buildings</u>		
<u>SRIZ</u>	<p><u>Activity status: RDIS</u></p> <p><u>1. New buildings and additions that increase trip generation by more than 50%.</u></p> <p><u>Where:</u></p> <p><u>A basic ITA is provided (as defined by TRAN-R8)</u></p> <p><u>Matters for discretion:</u></p> <p><u>2. The exercise of discretion in relation to SRIZ-R2 is restricted to the following matters:</u></p> <p style="padding-left: 40px;"><u>a. safety and efficiency</u></p> <p style="padding-left: 80px;"><u>i. the extent to which the provision of access and on-site manoeuvring areas associated with the activity including vehicle loading and servicing deliveries, affects the safety, efficiency, and accessibility of the site (by all modes including for people whose mobility is restricted), and land transport infrastructure (including considering the road classification of the frontage road); and</u></p> <p style="padding-left: 80px;"><u>ii. any mitigation proposed.</u></p> <p style="padding-left: 40px;"><u>b. design and layout</u></p>	<p><u>Activity status where compliance not achieved:</u></p> <p><u>When compliance with any of DPZ R3.1 is not achieved: DIS</u></p>



	<p><u><i>i. the extent to which the design and layout of the proposed activity maximises opportunities, to the extent practicable, for travel other than by private car, including providing safe and convenient access for travel by such modes; and ii. any mitigation proposed.</i></u></p>	
--	--	--

We recommend that this submission is rejected:

- The submission does not provide details of existing traffic generation for sites that are proposed to be subject to SRIZ-R2
- SRIZ-R2.1 is unclear whether the 50% threshold applies to the traffic generation of the entire SRIZ zone, or a specific site or building
- The submission does not provide an assessment of transport effects for 50% increase in traffic generation from sites that are proposed to be subject to SRIZ-R2. Therefore the safety and efficiency effects on the transport network from any activities that generate up to 50% increase in traffic are unknown.

**Outcome: We recommend that submission 165.44 is rejected.**

### 20.2 Submission 42.28

Timaru District Council seeks to amend TRAN-S20 to include in a high trip generator threshold for heavy vehicle movements, on the rationale that heavy vehicle movements can accelerate the need for pavement maintenance, remediation and/or upgrades, when these movements occur on roads not designed to carry heavy vehicles.

Refer to our discussion of this matter in response to Submission 42.27.

**Outcome: Refer to our discussion of this matter in response to Submission 42.27.**

### 20.3 Submission 106.9

The Ministry of Education seeks to amend Table 21 to increase the threshold at which an ITA is required, as in its view the number of students is not an accurate reflection of traffic movements. The following amendments are sought:

**Table 21 - High traffic generating activities.**

<b>Activity</b>	<b>ITA Required</b>		<b>Full ITA Required</b>	
<i>Education - Pre-school</i>	<i>40</i>	<i>Children</i>	<i>90</i>	<i>Children</i>
<i>Education - Schools</i>	<del><i>70</i></del> <u><i>100</i></u>	<i>Students</i>	<i>170</i>	<i>Students</i>
<i>[...]</i>	<i>[...]</i>	<i>[...]</i>	<i>[...]</i>	<i>[...]</i>

We note the following Canterbury based plans vary in how they treat Schools for high trip generating activities:

- Partially Operative Selwyn District Plan
  - TRAN-TABLE2: 70 students and 170 students for a basic and full ITA respectively



- Proposed Waimakariri District Plan
  - TRAN-R20 and Table TRAN1: Any activity generating over 200 vehicle movements per day in residential zones or 250 movements per day in mixed-use and commercial zones is considered a high trip-generating activity. Primary education is assumed to generate 0.7 veh/hr/student, and secondary education is assumed to generate 0.1 veh/hr/student (per TRAN-APP6).
- Christchurch District Plan
  - Rule 7.4.3.10(i): 150 students and 450 students for a basic and full ITA respectively

Industry standard vehicle trip rates are available for a range of activities in NZTA Research Report 453 - Trips and parking related to land use (2011)<sup>5</sup>. The vehicle trip rates can then be converted to a floor area or other scale-based value, such as roll of a school, to reflect a per hour or daily trip threshold that would trigger an ITA. In the case of Timaru, the thresholds of 50 vehicle trips per peak hour (basic ITA) and 120 vehicle trips per peak hour (full ITA) were adopted. In this way, the ITA thresholds are set at a similar level of traffic generation for all activities.

NZTA Research Report 453 identifies a peak hour trip rate for Primary Schools of 0.7 veh/hr per pupil, therefore 70 students are, on average, anticipated to generate 49 peak hour trips.

We therefore recommend that the 70 student threshold for requiring an ITA is retained.

**Outcome: We recommend that submission 106.9 is rejected.**

#### **20.4 Submission 116.9**

Z Energy Limited seeks to amend Table 21 such that it only applies to new service stations, or to existing activities that are expanded by the thresholds in the table.

We agree with the submitter that Table 21 should only apply when a new activity meets or exceeds the stated thresholds. Using the submitter's example, if a Service Station that had 5 filling points sought consent for an additional filling point, it would not trigger a requirement for a Full ITA. While the activity would result in 6 filling points on the site, the change in activity is only 1 filling point and therefore sits below the threshold for Table 21.

However, the relief sought by the submitter could, indirectly, infer that Service Stations should be assessed in a different manner to other activities in Table 21. Instead, we recommend that TRAN-R10 is amended as follows:

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<sup>5</sup> NZTA Research Report 453 - Trips and parking related to land use, available online at <https://www.nzta.govt.nz/resources/research/reports/453/>





<b>TRAN-R10</b>	<b>High trip generation activities</b>	
All Zones	<p><b>Activity status: Restricted Discretionary</b></p> <p><b>Where:</b></p> <p><b>RDIS-1</b></p> <p>Any <b>new or additional</b> use or development which generates vehicle trips that meet or exceed the thresholds in TRAN-S20.</p> <p>[...]</p>	Activity status when compliance not achieved: Not applicable

**Outcome: We recommend that submission 116.9 is accepted in part. We have proposed alternative wording to TRAN-R10 to address the relief sought.**

### 20.5 Submission 196.42

BP Oil, Mobil Oil New Zealand Limited, and Z Energy Limited seek to amend Table 21 such that it only applies to new service stations, or to existing activities that are expanded by the thresholds in the table. Further, the submitters seek to ensure that new activities at existing service stations, which do not generate new transport movements, are not captured. For example, where a petrol bowser was removed and an EV charger put in its place.

We note the terminology 'filling points' is sufficiently broad to include petrol, diesel and electrical filling points, hence with our proposed changes to TRAN-R10 (discussed in our response to submission 116.9 above), any change in type of filling point would not trigger the ITA threshold.

**Outcome: We recommend that submission 196.42 is rejected, as our recommended change to TRAN-R10 achieves the intent of the relief sought.**

### 20.6 Submission 242.15

Woolworths New Zealand Limited seeks to amend Table 21 to set a higher threshold for Supermarkets. The following amendments are sought:

**Table 21 - High traffic generating activities.**

<b>Activity</b>	<b>ITA Required</b>		<b>Full ITA Required</b>	
General Retail <del>and Supermarkets</del>	200	m <sup>2</sup> GLFA	800	m <sup>2</sup> GLFA
<b><u>Supermarkets</u></b>			<b><u>1500</u></b>	<b><u>m<sup>2</sup> GLFA</u></b>
[...]	[...]	[...]	[...]	[...]



Further, the submitter notes that the notified PDP defines a Supermarket as “...in individual premises of no less than 1,500m<sup>2</sup> of gross floor area”, and that this does not align with Table 21. As this is not a transport planning matter, we do not comment further on this definition.

In terms of the threshold at which an ITA should be required for a Supermarket, we note the following Canterbury based plans vary in how they treat Supermarkets for high trip generating activities:

- Partially Operative Selwyn District Plan
  - TRAN-TABLE2: Retail and Supermarkets 250m<sup>2</sup> GLFA and 900m<sup>2</sup> GLFA for a basic ITA and Full ITA respectively
- Proposed Waimakariri District Plan
  - TRAN-R20 and Table TRAN1: any activity that generates more than 200 vehicle movements per day (Residential zone) or 250 vehicle movements per day (Mixed Use and Commercial zone) is treated as a high trip generating activity. Supermarkets are assumed to generate 17.9 veh/hr/100m<sup>2</sup> GFA and 129 veh/day/100m<sup>2</sup> GFA per TRAN-APP6. As a result a Supermarket of 194m<sup>2</sup> in a Commercial zone is required to provide an ITA.
- Christchurch District Plan
  - Rule 7.4.3.10(ix): Retail of 500m<sup>2</sup> GLFA.

Industry standard vehicle trip rates are available for a range of activities in NZTA Research Report 453 - Trips and parking related to land use (2011)<sup>6</sup>. The vehicle trip rates can then be converted to a floor area or other scale-based value, such as roll of a school, to reflect a per hour or daily trip threshold that would trigger an ITA. In the case of Timaru the thresholds of 50 vehicle trips per peak hour or 250 vehicle trips per day were applied for a basic ITA, and 120 vehicle trips per peak hour or 1000 vehicle trips per day were applied for a full ITA. In this way, the ITA thresholds are set at a similar level of traffic generation for all activities.

NZTA Research Report 453 identifies that Supermarkets have a peak hour trip rate of 17.9 veh/hr/100m<sup>2</sup> GLFA and a daily trip rate of 129 veh/day/100m<sup>2</sup> GLFA. Therefore, converting the ITA thresholds using the hourly and daily trip rate, the following rates are calculated:

- Basic ITA
  - 280 m<sup>2</sup> GLFA if 50 veh/hr is applied
  - 200 m<sup>2</sup> GLFA if 250 veh/day is applied
- Full ITA
  - 670 m<sup>2</sup> GLFA if 120 veh/hr is applied
  - 775 m<sup>2</sup> GLFA if 1000 veh/day is applied

Therefore, the basic and full ITA thresholds as shown in the PDP are appropriate as they align with the above assessment.

**Outcome: Regarding submission 242.15, we recommend that Council’s Planner consider whether the PDP definition for Supermarket requires amendment. We recommend that Council reject the amendments sought for Table 21.**

## 21. SCHED1 - Schedule of Roading Hierarchy

### 21.1 Submission 42.69

The submitter seeks to include several roads as Principal Roads.

<sup>6</sup> NZTA Research Report 453 - Trips and parking related to land use, available online at <https://www.nzta.govt.nz/resources/research/reports/453/>

### Road 5 DEV 3 - Washdyke Industrial Development Area Plan

The submitter considers that a new Road (Road 5) to link Seadown Road and Meadows Road, identified in DEV 3 - Washdyke Industrial Development Area Plan (shown in Figure 21.1), should be classed the same as the roads it links.

We understand that the area was rezoned under Plan Change 14. At the time, we understand that both Seadown Road and Meadows Road were classified as Collector Roads, and therefore Road 5 was given the same classification. In the Proposed District Plan, Seadown Road is classified as a Principal Road and Meadows Road is classified as a District Arterial. We therefore support Road 5 being classified as a Principal Road as it will form a natural extension of Seadown Road

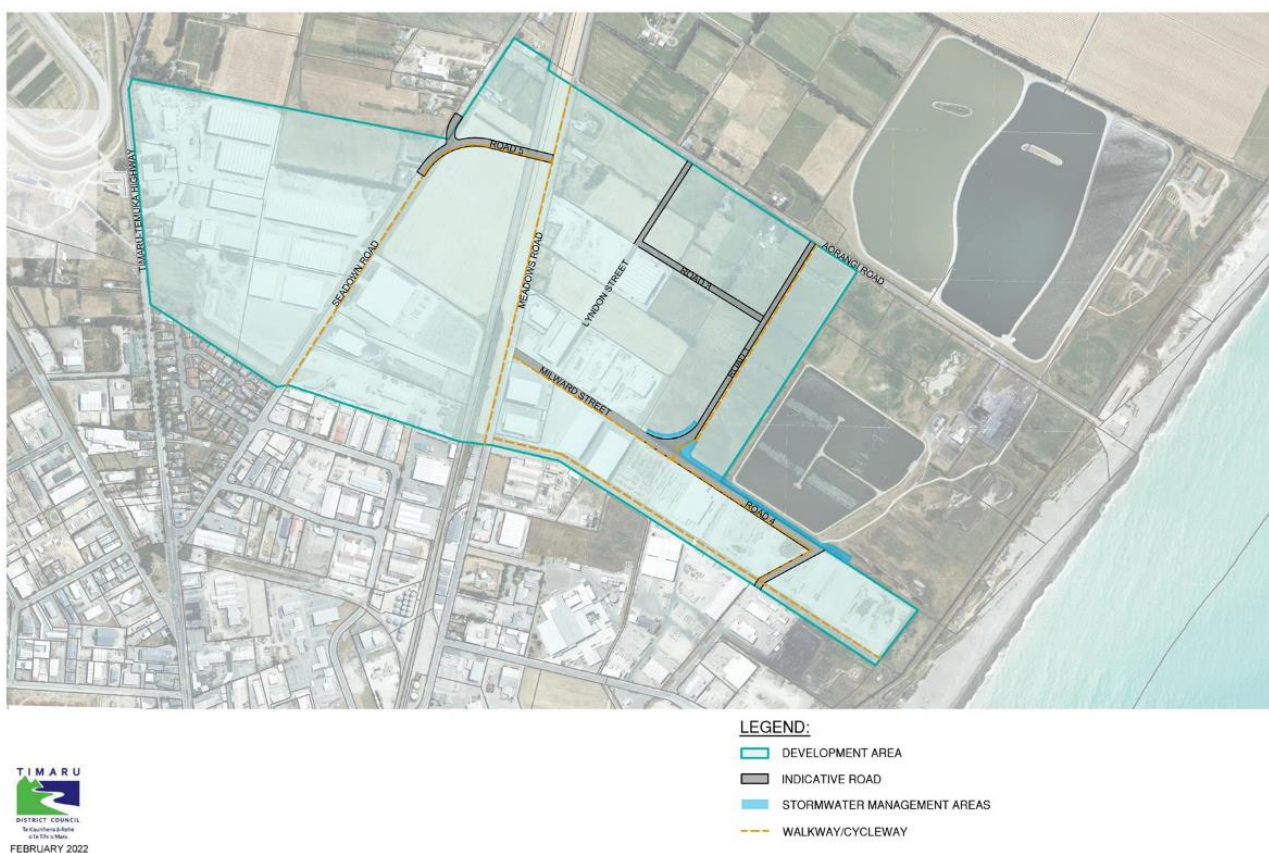


Figure 21.1: PDP Figure 23 - Washdyke Industrial Development Area Plan (showing Road 5)

### Falvey Road, Levels Plain Road, and Brosnan Road

The submitter also requests that Falvey Road, Levels Plain Road, and Brosnan Road be classified as Principal Roads, but no rationale is provided for this request. The PDP Roading Hierarchy near these roads is shown in Figure 21.2:

- Pleasant Point Highway (SH8) and Timaru-Temuka Highway (SH1) are classified as National Routes
- Arowhenua Road is classified as a Principal Road
- Seadown, Dominion Road East, Arowhenua Station Road, Falvey Road and Levels Plain Road are classified as Collector Roads
- All other roads in the area, including Brosnan Road, are unclassified.

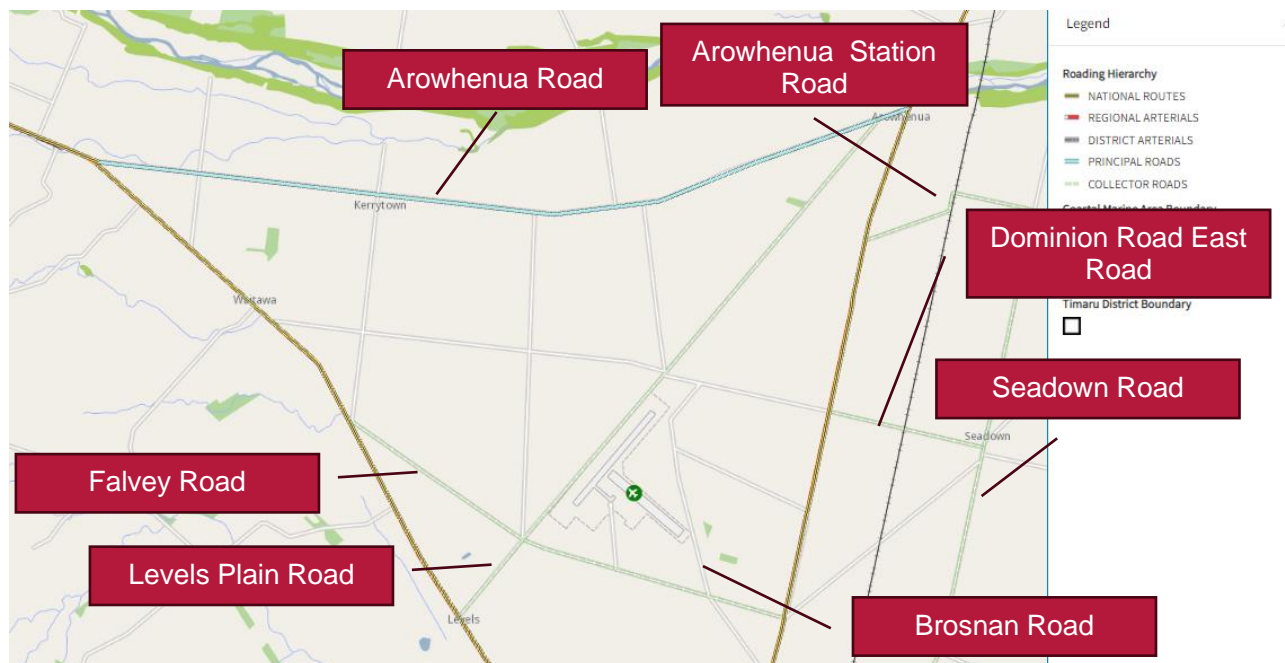


Figure 21.2: PDP Roding Hierarchy

We have investigated traffic count data for these roads, however Council does not appear to have this information publicly available. We have therefore referenced MobileRoads for estimates of traffic volumes, which we have reproduced below in Table 21.1. We acknowledge that existing traffic volumes are only one consideration in terms of road classification, however they do give some indication of the current use of the respective roads.

This data indicates that Levels Plain Road and Falvey Road carry similar traffic volumes to Arowhenua Road (classified as a Principal Road) and Dominion Road East and Arowhenua Station Road (classified as Collector Roads). However, Brosnan Road carries very little traffic.

Table 21.1 MobileRoads traffic volume estimates

Road	Average daily traffic count estimate	PDP Roding Hierarchy
Arowhenua Road	~750 veh/day	Principal
Seadown Road	~1000 – 1300 veh/day	Collector
Dominion Road East	~650 veh/day	Collector
Arowhenua Station Road	~300 veh/day	Collector
Levels Plains Road	~500 – 950 veh/day	Collector
Falvey Road	~350 – 650 veh/day	Collector
Brosnan Road	~ <250 veh/day	Unclassified

We also reviewed whether Falvey Road, Levels Plain Road, or Brosnan Road were identified in any Transport Strategies as significant. However, we found no references indicating that these roads need to serve a future function beyond their current role, although they all provide access to Timaru Airport.

Classifying a road as a Principal Road imposes additional requirements for accessways and vehicle crossings on properties fronting the road. Therefore, decisions regarding roading hierarchy should consider the impact on adjacent properties. We believe there is insufficient evidence provided by the

submitter to support classifying Falvey Road, Levels Plain Road, and Brosnan Road as Principal Roads.

**Outcome: We recommend that Road 5 of the DEV 3 - Washdyke Industrial Development Area Plan is identified as a Principal Road. We recommend that road hierarchy change requests for Falvey Road, Levels Plain Road, and Brosnan Road are rejected.**

## 21.2 Submission 165.6

Fonterra Limited requests that Kotuku Place not be classified as a Regional Arterial. Instead, the submitter seeks that Canal Road to the intersection of Canal Road / Rolleston Road / Milford Clandeboye Road be a Regional Arterial.

The PDP Roding Hierarchy is shown in Figure 21.3. It appears that the classification of Kotuku Place as a Regional Arterial is a mapping error, and we note that Kotuku Place is not included in SCHED1. We agree with the submitter that Canal Road should be identified as the Regional Arterial and Kotuku Place should have no classification in the Road Hierarchy, we recommend that the GIS layer is updated, refer to our markup in Figure 21.4.



Figure 21.3 PDP Roding Hierarchy (intersection of Canal Road / Rolleston Road / Milford Clandeboye Road)

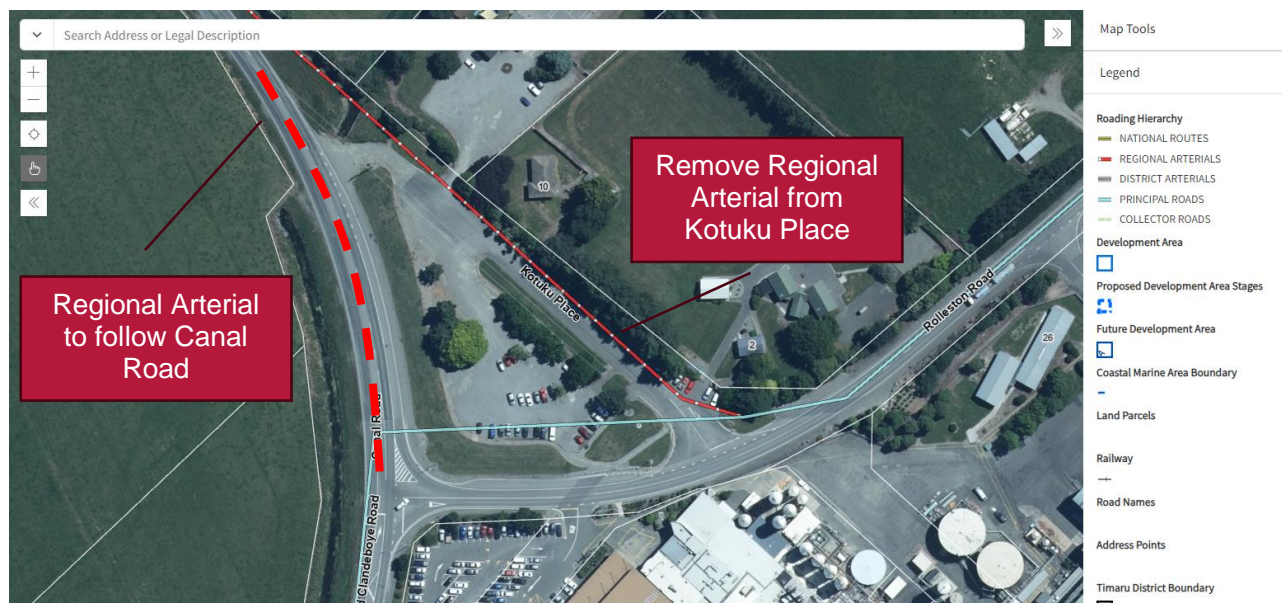


Figure 21.4 PDP Roading Hierarchy (Kotuku Place)

**Outcome: We recommend that submission 165.6 is accepted.**

### 21.3 Submission 174.95

Rooney Holdings Limited argues that the proposed new road (Road 5), which will link Seadown Road and Meadows Road as identified in the DEV 3 - Washdyke Industrial Development Area Plan (Figure 21.1), should be classified as a Local Road. The submitter expresses concern that if Road 5 is classified as a higher-order road, the Council should be responsible for its design and construction, and compensation should be provided to the landowner.

The area was rezoned under Plan Change 22, which became operative on July 1, 2021. While the technical assessments for Plan Change 22 were not provided for review, as discussed in Section 21.1 of this technical note, it seems logical to classify Road 5 as a Principal Road since it serves as an extension/realignment of Seadown Road.

In our view, the submitter's primary concern appears to be related to who bears the cost of delivering the road, rather than the road's classification. We note that DEV3-S5 Vesting of roads services and infrastructure, includes the following Note:

1. *The actual cost of road, utility services and walkway/cycleway construction will be apportioned between the developer and Council, with that apportionment to be determined on the basis of the percentage of public versus private benefit.*

We therefore consider that matters about the cost of delivering Road 5 can be addressed during future resource consents. We note that it is not uncommon for developers to deliver a Collector Road, and for Council to fund the cost difference to have this constructed as a higher order road (such as a Principal Road, Arterial Road etc).

**Outcome: We recommend that Submission 174.95 be rejected.**

### 21.4 Submission 167.49

Broughs Gully Development Limited requests clarification whether Road 1 in identified in DEV 1 - Broughs Gully Development Area Plan (shown in Figure 21.1), should be classed the same as the Lancewood Terrace, which Road 1 forms an extension of. Lancewood Terrace is classified as a Collector Road in SCHED1.

DEV 1 - Broughs Gully Development Area Plan does not provide a roading hierarchy for proposed roads, although the Plan Change for the site (PC21) described Road 1 as follows:

*Road 1 is proposed as the primary transport link through the site, providing linkages and connectivity with the wider transport network<sup>7</sup>.*

This indicates that Road 1 is a higher order road, compared with other roads within the site, and we recommend that Road 1 is classified in SCHED1 as a Collector Road.

**Outcome: We recommend that DEV 1 - Broughs Gully Development Area Plan Road 1 is classified in SCHED1 as a Collector Road**

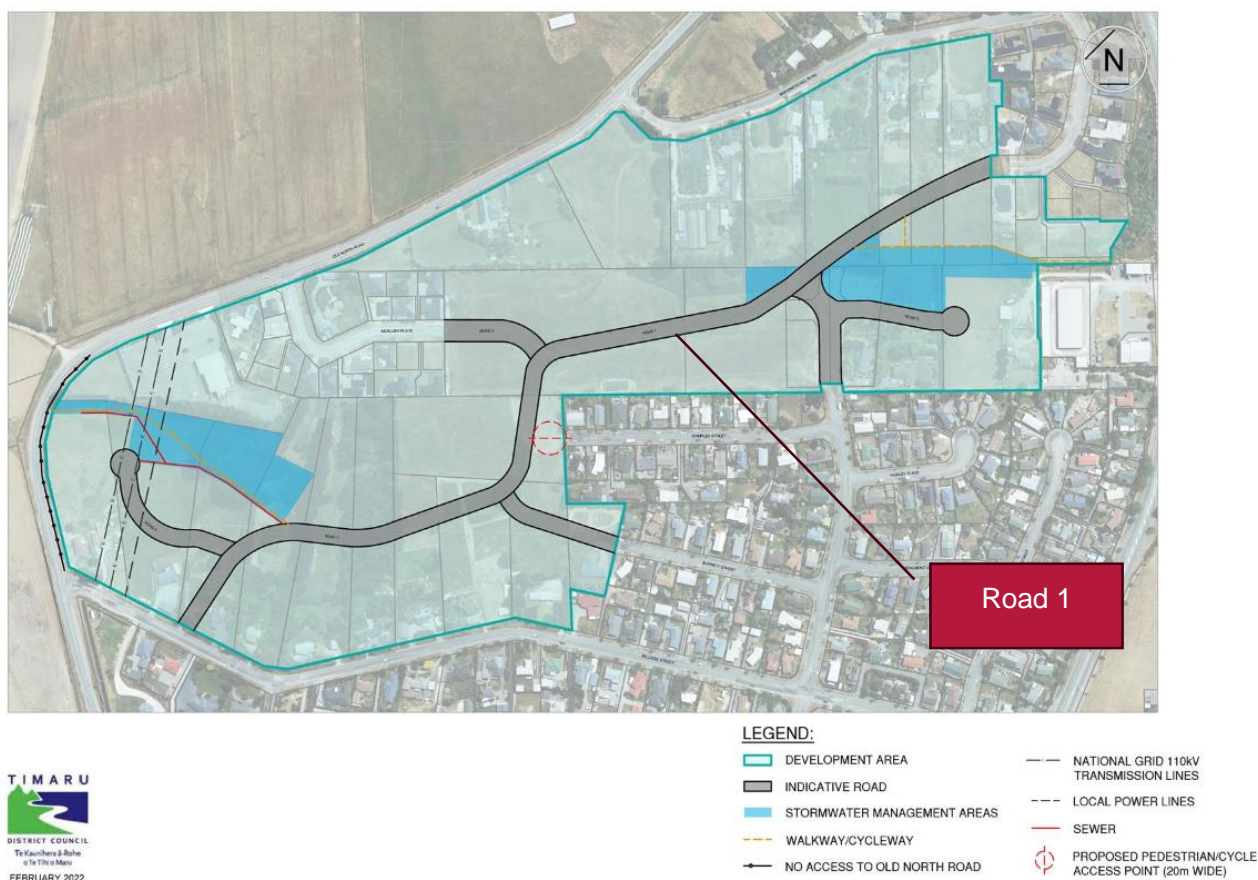


Figure 21.5 DEV 1 - Broughs Gully Development Area Plan (showing Road 1)

<sup>7</sup> Section 6.2 Transport Effects, Proposed Plan Change to the Timaru District Plan, Broughs Gully Outline Development Plan, Planz Consultants, dated November 2016



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## Appendix A. Timaru District Council Pavement Modelling, GeoSolve





GeoSolve Ref: 240861  
26 November 2024

Timaru District Council  
PO Box 552  
Timaru 7940

Attention: Suzy Ratahi

## Timaru District Council Pavement Modelling

Dear Suzy,

In accordance with our Agreement dated 18 November 2024, we have undertaken a pavement modelling assessment using pavement deflection and traffic data extracted from the Timaru District Council (TDC) roading database (RAMM). Multiple scenarios of additional heavy vehicle traffic were modelled to understand the impact of different sized developments on different types of roads within the TDC road network.

### Executive Summary

Timaru District Council has been confronted with significant deterioration of roads near new or expanded developments which generate significant heavy commercial vehicle (HCV) traffic. A recent example includes Taiko and Robinson Roads, after a lime quarry was expanded to include managed filling. This included an additional 30 heavy vehicles movements, almost 50% of which included high productivity 50MAX trucks. Road maintenance needs have increased exponentially after the managed fill operations started. This road will likely need to be reconstructed to support this additional traffic which has significant cost implications to TDC and its rate payers.

TDC seeks to amend the District Plan to include a requirement to undertake a Pavement Impact Assessment (PIA) when heavy vehicle traffic generated by the proposed development is likely to impact the pavement. This provides a means for TDC to secure funding from the developer where the financial impact and risk of the additional development traffic on the surrounding roads is shown to be significant. To ensure these assessments are made where they are truly needed and to avoid creating unnecessary bureaucracy for small/low impact developments, conditions/criteria for where these Pavement Impact Assessments are required need to be defined. TDC engaged GeoSolve to undertake pavements modelling and analysis to provide district wide evidence (in addition to anecdotal evidence such as Taiko and Robinson roads) to:

- 1) Demonstrate relevance – what percentage of the network will be significantly impacted by additional HCVs?
- 2) Define the threshold for relevance – Under what conditions (e.g. % increase HCV) do roads have the potential to be significantly impacted by additional HCVs?



## Network Relevance

What percentage of the network surveyed will be significantly impacted by additional HCVs?

Significant impact (theoretical) has been nominally assumed for the purposes of this report as follows:

- 1) The road is vulnerable to additional HCV traffic and will require maintenance or reconstruction in the foreseeable (25-year horizon) future because of this additional traffic AND;
- 2) The **minimum**<sup>1</sup> financial implication (increase in present-value cost) to bring the pavement rehabilitation work forward in the works programme is greater than 7% of the status quo cost

On low volume roads, “end of life” roads often persist for much longer than expected as a result of infrequent HCV movements and reduced exposure to heavy loading when the pavement is in its most critical condition (higher moisture content). On these roads, there are opportunities to extend the life of the asset provided the HCV movements remain low. An increase in HCV movements could suddenly tip the balance and a road that could be managed with occasional patches and dig outs now requires rehabilitation (e.g. Robinson and Taiko). Furthermore, the rehabilitation treatments are often much more costly – deeper/thicker to accommodate the higher traffic. Therefore, the impact is likely to be significant. As a sensitivity check, these weak vulnerable roads are included in the definition of a significant impact (practical) by adding a third clause (see below) where either clause 2 or 3 must be true to be considered significantly impacted:

- 3) The remaining life of the pavement with additional HCV traffic is less than or equal to 3 years.

For small, medium and large additional HCV movements, Table 1 shows the percent of the network significantly impacted (theoretical and practical) as per the definitions above.

**Table 1. Percent of network significantly impacted by the additional HCV scenario**

<b>Additional Daily HCV Movements (In and Out)</b>	<b>% of Network Significantly Impacted (Theoretical)</b>	<b>% of Network Significantly Impacted (Practical)</b>
5	7%	31%
20	16%	39%
100	27%	48%

<sup>1</sup> Financial implication only considers the penalty imposed by compounding interest when bringing work forward in the programme. Another financial implication is that more treatment (deeper/thicker pavement, stiffer with more expensive materials) will be required to support the current and additional traffic.



## Threshold for Relevance

Under what conditions do some roads become significantly impacted by additional HCVs?

### **% Increase in HCV Trigger**

The pavement modelling shows that a 5% increase in current HCV numbers will significantly impact 7% of the network. It is therefore recommended that a 5% increase in HCV over the current HCV use on the road is the minimum threshold to require a detailed Pavement Impact Assessment. Minor increases in HCV (<5%) are considered trivial with negligible impact for greater than 95% of the network.

The following limitations/risks apply to this approach:

- a) Accuracy and availability of current traffic data
- b) This recommendation is based on the assumption that each HCV movement contributes roughly 2 Equivalent Standard Axle (ESA) loadings consistent with a Class 1 two axle rigid truck. This assumption may be low for cases where all or more HCVs are expected to contribute more than 2 ESAs per movement.

### **Non-Standard Axle Loads**

If the new development proposes to use High Productivity Motor Vehicles (HPMV) which exceed standard Class 1 individual axle, axle set and combined axle set load limits as defined by NZTA<sup>2</sup>, this should also trigger a Pavement Impact Assessment as overloaded vehicles have an exponential impact on pavements.

## Conclusion

The findings above, as well as specific case studies, clearly show that both small and large developments that generate heavy vehicle traffic can significantly impact the surrounding local roads. Under the Resource Management Act, these adverse effects must be quantified and addressed by the developer in a Pavement Impact Assessment. Therefore, it is strongly recommended that the District Plan is changed to require a Pavement Impact Assessment where:

- a) The proposed development is expected to generate heavy vehicle traffic that is 5% or more than the current heavy vehicle traffic on the road(s) affected; OR
- b) The proposed development is expected to use high productivity motor vehicles (HPMV) with non-standard axle loadings exceeding NZTA class 1 axle limits.

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<sup>2</sup> <https://www.nzta.govt.nz/vehicles/vehicle-types/vehicle-classes-and-standards/vehicle-dimensions-and-mass/>



## Introduction

Local roads are particularly vulnerable to increased axle loadings. This is summarised well in the Effects of Increased Axle Loadings on Local Roads<sup>3</sup> where the adverse effects of a sudden increase in heavy vehicles are noted including:

- Increased routine maintenance/resurfacing frequency
- Reduction in level of service
- Reduced structural life (e.g. funding is required earlier)
- Increased construction costs
- Cost of control measures (e.g. lowering speed limits, signage, turning lanes, etc)
- Environmental (e.g. gaseous emissions and noise pollution)

Under section 17 of the Resource Management Act:

***Every person has a duty to avoid, remedy, or mitigate any adverse effect on the environment arising from an activity carried on by or on behalf of the person.***

This report focuses on the above effects on road pavements caused by the proposed development.

## Pavement Data

To estimate pavement remaining life, pavement deflection data collected using the Falling Weight Deflectometer (FWD) and Laser Measure Deflectometer/Traffic Speed Deflectometer (LMD/TSD) were extracted from the Timaru DC RAMM database. The data were cleaned (duplicates removed to only include the latest readings) and central deflection readings were load and equipment standardised. The data were collected between 2000 and 2024.

## Traffic Data

Estimated average daily traffic, %HCV, ESA/HCV, one national road classification (ONRC) and urban/rural classification were also extracted from the Timaru DC carriageway and treatment length tables from RAMM.

## Analysis Methodology

Detailed methodology for calculating pavement remaining life, current traffic demand and development scenario traffic demands is included in Appendix A and summarised below:

For each LMD and FWD data point:

1. Calculate remaining ESA using load and equipment standardised FWD/LMD central deflection data according to Austroads AGPT05-19: Pavement Evaluation and Treatment Design (2019) Section 9.4, Equations 6 and 7, Figure 9.2.
2. Calculate current traffic demand (annual ESA) as a function of average daily traffic, %HCV, ESA/HCV and directional factor.
3. Calculate current remaining life as a function of remaining ESA (1) and annual ESA (2)
4. Calculate development traffic demand for 4 scenarios (5, 10, 20 and 100 HCV carriageway movements).

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<sup>3</sup> GeoSolve. *Effects of Increased Axle Loadings on Local Roads*.



5. Calculate remaining life with development traffic as a function of remaining ESA (1), annual ESA (2) and development annual ESA (4) for each of the four scenarios.
6. Calculate present value implication as % change in Single Payment Present Worth factor between current traffic remaining life and development traffic scenario remaining life.
7. Identify vulnerable pavements where development scenario remaining life is less than 25 years.
8. Identify significant pavements where present value implication is greater than 7%.
9. Identify vulnerable and significant pavements as per (7) and (8) above.
10. Calculate % increase in ESA and HCV between development scenario traffic and current traffic.

## Network Results

Significant impact has been nominally assumed for the purposes of this report defined as follows:

- 1) The road is vulnerable to additional HCV traffic and will require maintenance or reconstruction in the foreseeable (25-year horizon) future because of this additional traffic AND;
- 2) The **minimum**<sup>4</sup> financial implication (increase in present-value cost) to bring the pavement rehabilitation work forward in the works programme is greater than 7%

To understand the impact on the network for small and large developments, the percent of significantly impacted road sections are analysed for each scenario and reported below according to ONRC and Urban/Rural categories.

Figure 1 to Figure 4 highlight how some road categories are more affected by increased traffic than others:

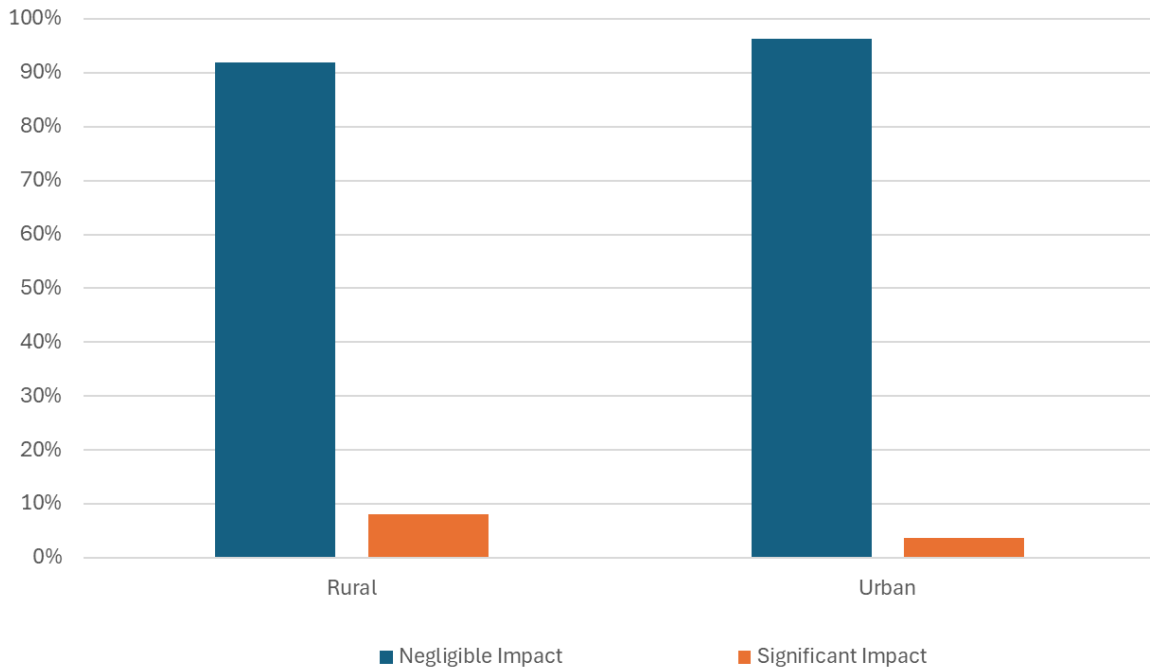
- Rural roads are more impacted than urban roads
- Lower volume roads are more impacted than higher volume roads

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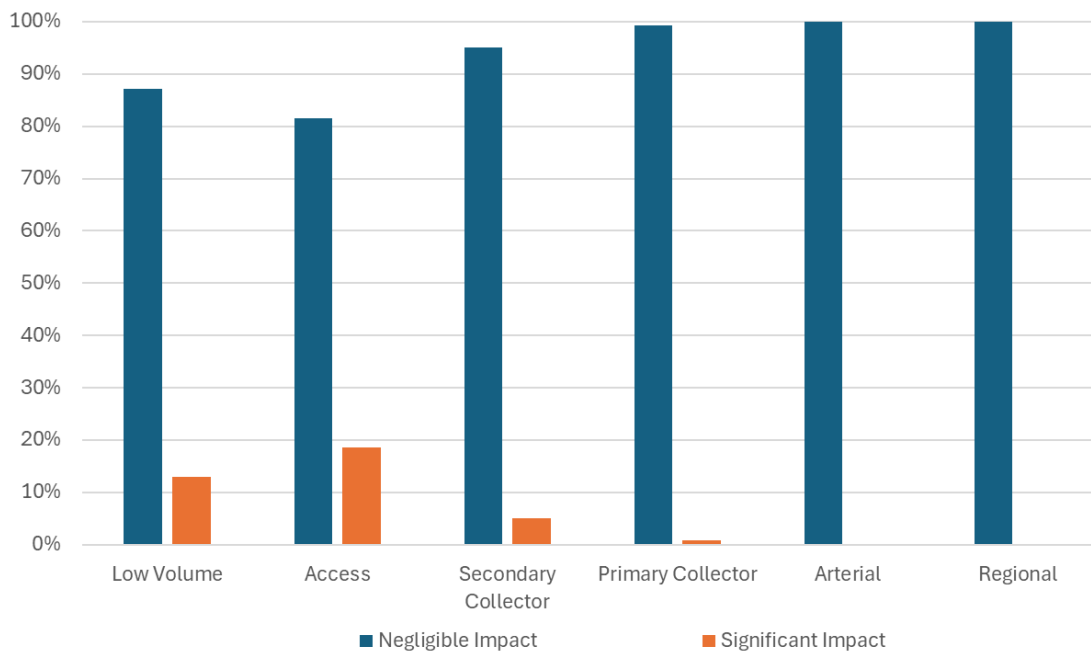
<sup>4</sup> Financial implication only considers the penalty imposed by compounding interest when bringing work forward in the programme. Another financial implication is that more treatment (deeper/thicker pavement, stiffer with more expensive materials) will be required to support the current and additional traffic.



**Small Development (5 HCV/carriageway/day)**



**Figure 1. Percent of Urban and Rural Roads Significantly Impacted by Small Development HCV Traffic**



**Figure 2. Percent of Roads (By Road Classification Category) Significantly Impacted by Small Development HCV Traffic**



### Large Development (100 HCV/Carriageway/day)

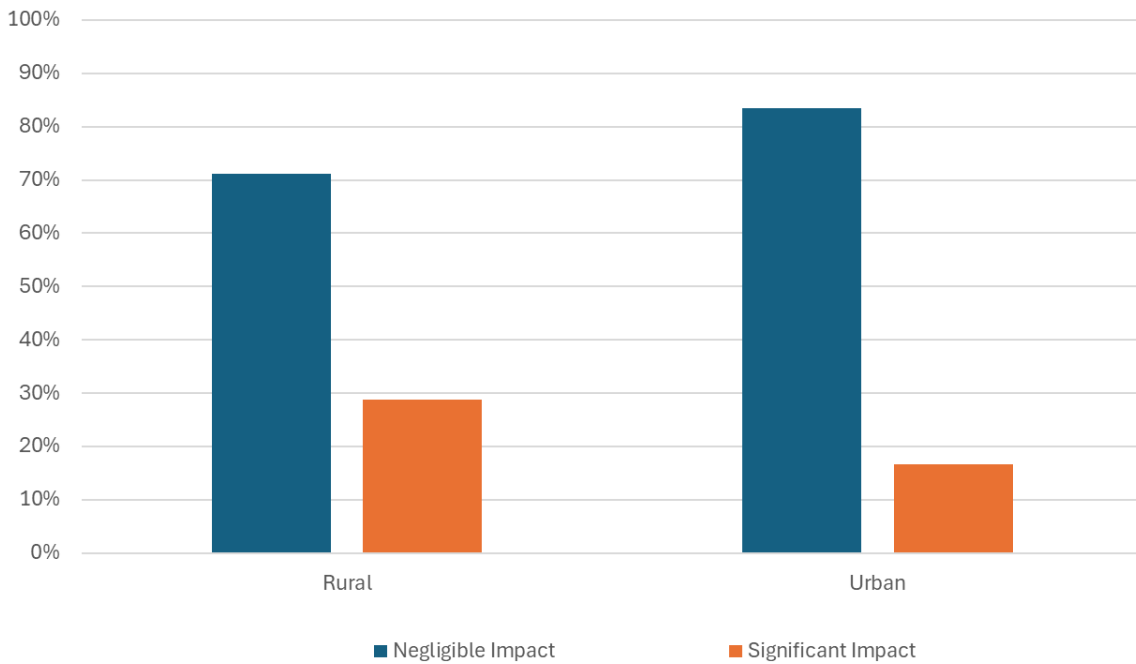


Figure 3. Percent of Urban and Rural Roads Significantly Impacted by Large Development HCV Traffic

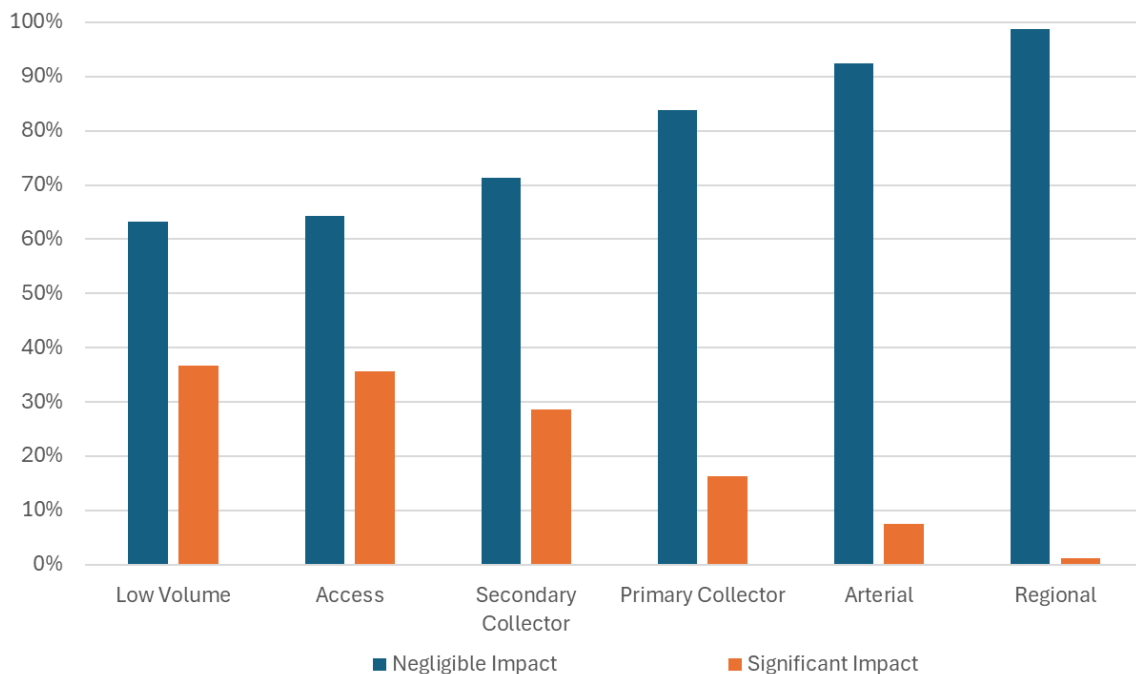


Figure 4. Percent of Roads (By Road Classification Category) Significantly Impacted by Large Development HCV Traffic



## Small vs Large Developments

As shown in Table 2 below, a 2000% increase in development traffic (from 5 to 100 HCV/Carriageway/Day) results in a 20% increase (from 7 to 27%) in road segments significantly impacted by this change. The bulk of this impact is on rural and lower volume roads, however higher volume road categories (secondary and primary collectors and arterials) also begin to be impacted by larger developments.

**Table 2. Small vs Large Development Impact**

Road Categories	% Significant Impact with Small Development Traffic (5 HCV/Carriageway/Day) by Road Category	% Significant Impact with Large Development Traffic (100 HCV/Carriageway/Day) by Road Category
All Roads	7%	27%
Urban	4%	17%
Rural	8%	29%
Low Volume	13%	37%
Access	19%	36%
Secondary Collectors	5%	29%
Primary Collectors	1%	16%
Arterials	0%	8%
Regional	0%	1%

## Sensitivity Case: Impact on Weak Low Volume Roads

There is a significant portion of weak roads in the TDC Network with less than 1-year remaining life. These roads, in theory, are expected to require imminent structural maintenance. Adding additional heavy vehicle traffic, theoretically, has minimal impact in terms of bring the work item forward in the rehab programme. The present value implication is less than 7%. Therefore, under the definition of significant impact they do not quality.

However, in practice on low volume roads, these roads defy theory and exceed their expected life by many years. This is attributed to the infrequency of heavy vehicle traffic, which reduces the probability of the pavement being exposed to critical loading at critical times such as when the pavement is saturated.

On these roads, there are opportunities to extend the life of the asset provided the HCV movements stay low. An increase in HCV movements could suddenly tip the balance and a road that could be managed with occasional patches and dig outs now requires rehabilitation (e.g. Robinson and Taiko). Furthermore, the rehabilitation treatments are often





much more costly – deeper/thicker to accommodate the higher traffic. Therefore, the real impact on these roads by additional traffic is that this opportunity to extend the pavement life is no longer available.

To capture this risk/lost opportunity to TDC, a sensitivity case was included by revising the definition of significant impact to include any road section with less than or equal to 3 years remaining life with the additional development traffic.

Table 3 is a copy of Table 2 updated to reflect percentages of the network significantly impacted according to this updated definition. A very stark picture is illustrated with a third of the entire network being significantly affected by a small development with 5 HCV movements per day and half the network being significantly affected by a large development with 100 HCV movements per day.

**Table 3. Percent of Network Significantly Impacted (Revised Definition)**

<b>Road Categories</b>	<b>% Significant Impact with Small Development Traffic (5 HCV/Carriageway/Day) by Road Category</b>	<b>% Significant Impact with Large Development Traffic (100 HCV/Carriageway/Day) by Road Category</b>
All Roads	31%	48%
Urban	13%	25%
Rural	35%	52%
Low Volume	18%	42%
Access	46%	62%
Secondary Collectors	39%	59%
Primary Collectors	11%	24%
Arterials	3%	10%
Regional	1%	2%

### **Threshold % Increase HCV for Significant Impact**

Now that it has been established that developments that generate heavy vehicle movements do impact a significant portion of the TDC roading network, iterative analysis was carried out to determine what % increase in HCV (compared to current HCV) creates a significant impact ie. over 5% of the network. For each road section analysed, the % increase in HCV was incrementally increased by 1% and the number of test locations that became significantly impacted were counted and divided by the total number of test locations. This is documented in Table 4. A 1-3% increase in HCV has virtually no impact to all data points



analysed. A 5% increase in HCV results in 7% of the network becoming significantly impacted.

**Table 4. Impact of % HCV Increase**

<b>% Increase HCV</b>	<b>% of Test Locations that are Significantly Impacted</b>
1%	0%
2%	0.17%
3%	1.78%
4%	4.06%
5%	6.77%

The above analysis is sensitive to the following variables:

- Accuracy of the current HCV traffic as supplied by TDC RAMM
- Average ESA/HCV of the proposed development traffic

This threshold rule of thumb could be lower where the current HCV traffic is much lower than what is inferred from RAMM or where the average ESA/HCV of the development traffic is much higher than the assumed 2 ESA/HCV used in this analysis.

This 5% threshold in terms of Standard Axle Repetitions (SAR, similar to ESA) is also used throughout the Queensland Guide to Traffic Impact Assessment (Dec 2018)<sup>5</sup> and Pavement Impact Assessment Practice Note, although the rationale for this is not explained.

### **Overloaded Vehicles**

In addition to the 5% HCV increase threshold, where any of the proposed development vehicles are proposed to be non-standard according to NZTA<sup>6</sup> (HPMV), this should also trigger a Pavement Impact Assessment as overloaded axles have an exponential impact on pavements<sup>7</sup>.

### **Limitations**

Predicting pavement life is complex and depends on numerous factors difficult to capture including:

- Pavement materials
- Construction methodology

<sup>5</sup> <https://www.tmr.qld.gov.au/business-industry/Technical-standards-publications/Guide-to-Traffic-Impact-Assessment>

<sup>6</sup> <https://www.nzta.govt.nz/vehicles/vehicle-types/vehicle-classes-and-standards/vehicle-dimensions-and-mass/>

<sup>7</sup> Austroads AGPT02-24, Guide to Pavement Technology Part 2: Pavement Structural Design, Section 7.6.2



- Drainage
- Waterproofness of the surfacing
- Pavement strength
- Traffic spectrum and frequency
- Climate

For the purpose of carrying out this analysis, a simple, single parameter model from Austroads<sup>8</sup> based on central deflection was used to predict remaining equivalent standard axle loads. Given that this model relies on one variable and at least seven are identified above, the accuracy of this model, particularly on low volume roads and on roads with a remaining life greater than 3 years is expected to be low. However, it is a systematic and simple approach that has been applied to all the data which ensures a direct comparison can be made.

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<sup>8</sup> Austroads Guide to Pavement Technology Part 5: Pavement Evaluation and Treatment Design (AGPT05-19). Section 9.4. 2019.

## Case Studies – Impact on Specific Roads

### Taiko Road and Robinson Road

Taiko and Robinson Roads (Figure 5) are examples of the need for this proposed change to the district plan. The detrimental effects of significant additional HCV traffic are rapidly appearing with major ruts and potholes forming and requiring immediate maintenance. The expansion of the lime quarry to a managed fill site included High Productivity Motor Vehicles (HPMV) trucks which when fully loaded are expected to contribute 8 Equivalent Standard Axle Loads<sup>9</sup> per pass. That means one HPMV has the impact of four rigid 2 axle trucks<sup>10</sup>. The proposed development included 14 additional rigid truck carriageway movements and 20 additional HPMV carriageway movements which result in an increase of 100 ESAs per day per lane. This is twice the traffic of the 100 additional HCV movements modelling scenario, ie. a large development with a significant increase in HCV traffic.



**Figure 5. Managed Fill Site Location with Respect to Taiko and Robinson Roads**

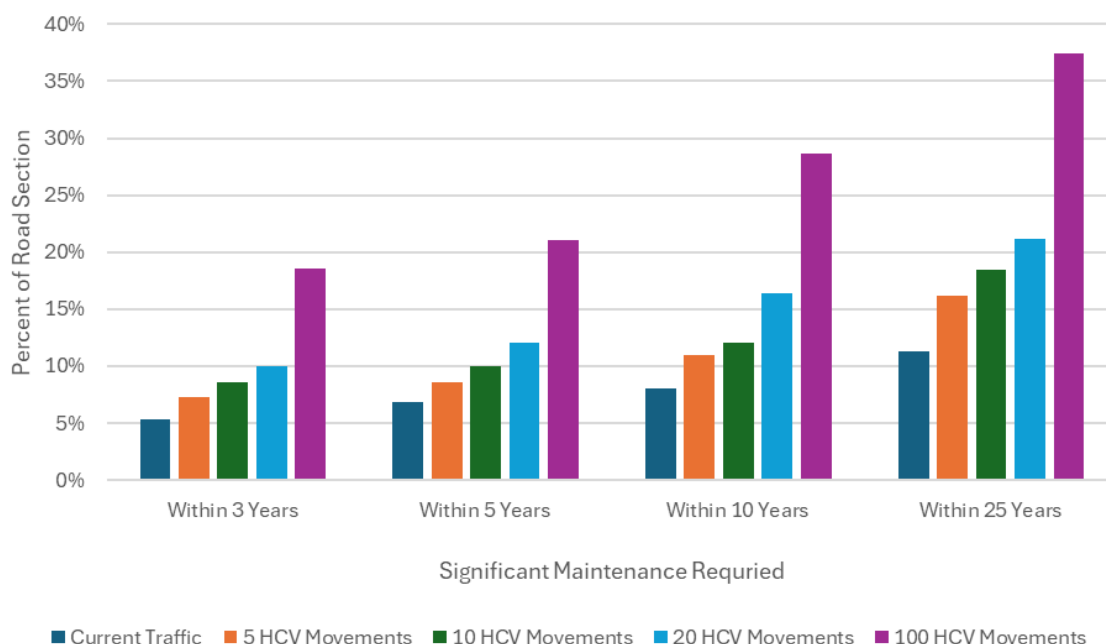
Figure 6 and Figure 7 illustrate the short- and long-term impact of additional development traffic. For example, for Taiko Road chainage 13 to 15 km, only 5% of this road section requires maintenances in the next 3 years under the pre-development traffic. With the 100 HCV case, this increases to nearly 20% (4 times the maintenance quantity). Over the long term (25 years), under pre-development traffic, 12% of the road section will require maintenance. With development traffic, 38% of the road will require maintenance which indicates that parts or all of the relevant Taiko Road section will need to be rehabilitated to support the development traffic. Similar trends are also seen on Robinson Road in Figure 7. Overall percentages are lower on Robinson Road as it appears to be stronger than Taiko Road with higher overall remaining life.

<sup>9</sup> Assuming 4<sup>th</sup> power load damage exponent

<sup>10</sup> Assuming 2 ESA/HCV

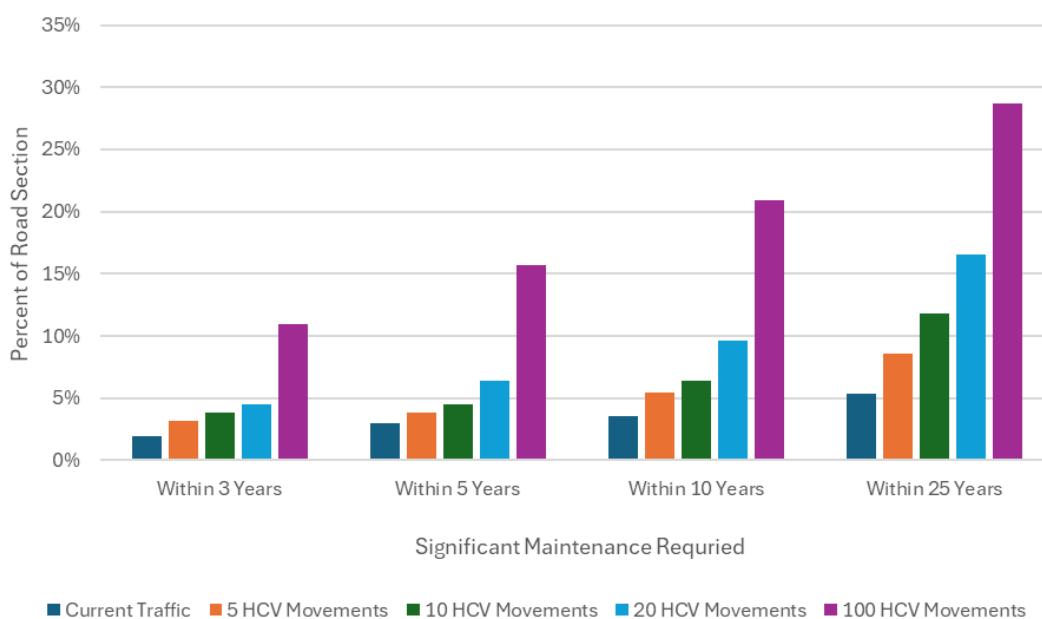


### Taiko Road Ch 13 to 15 km



**Figure 6. Maintenance requirements on Taiko Rd Chainage 13 to 15 km for current traffic and additional HCV scenarios**

### Robinson Road (Ch 0 to 2 km)

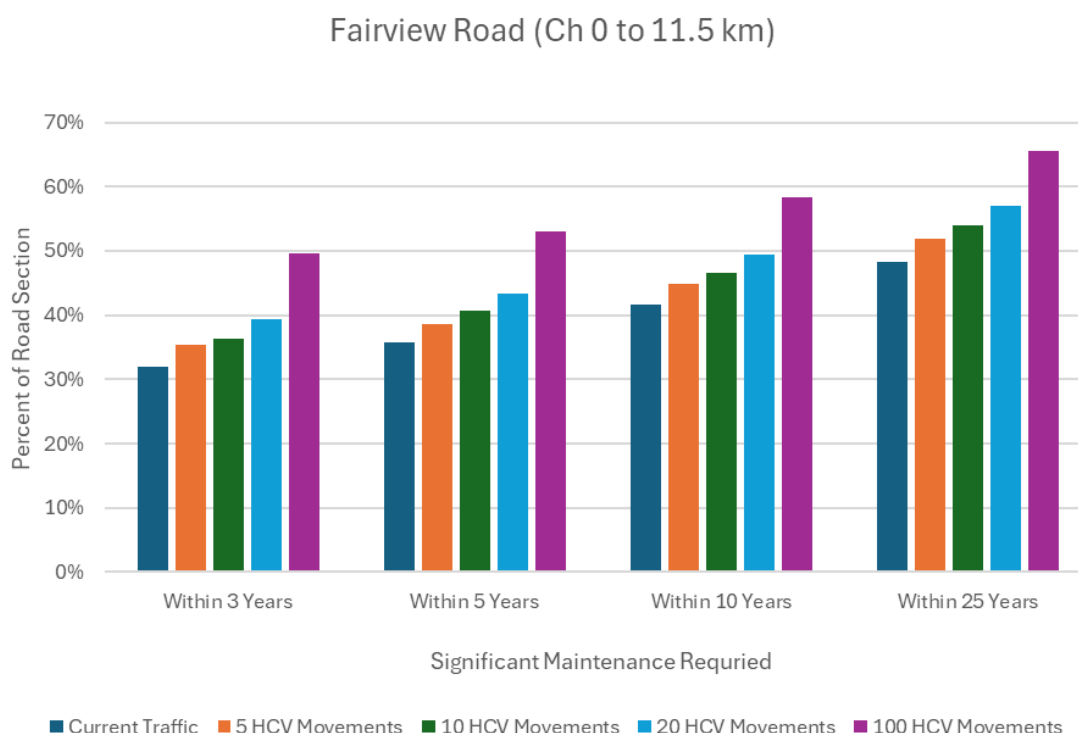


**Figure 7. Maintenance requirements on Robinson Rd Chainage 0 to 2km for current traffic and additional HCV scenarios**



### Fairview Road

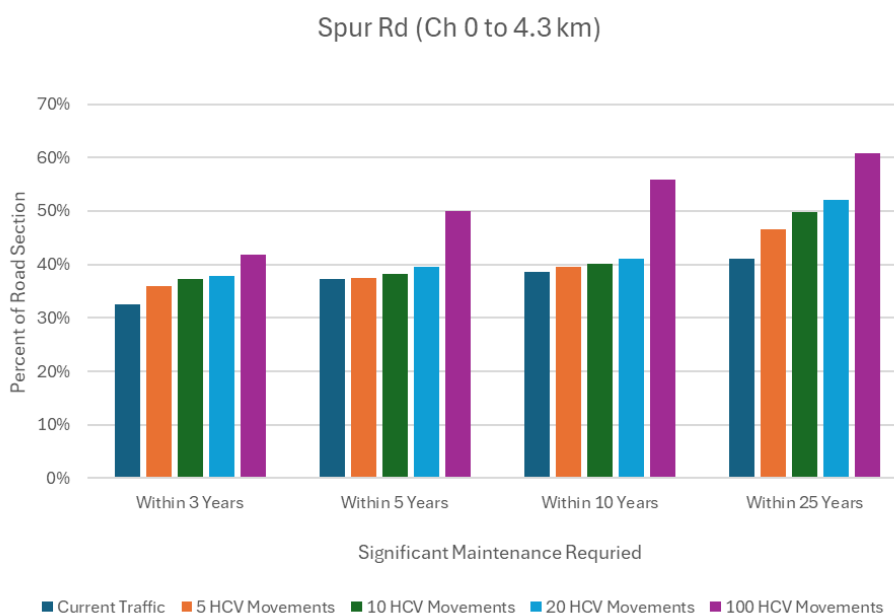
Compared to Robinson and Taiko Roads, significant portions of Fairview Road are at end of life even under the current traffic scenario (Figure 8). This is not unexpected given that it serves as a collector in a rural environment, and it was constructed in the 60s or 70s for fewer and lighter trucks. Notwithstanding, a large development (100 carriageway HCV movements per day) increases maintenance quantities over the pre-development scenario by 15 to 20%.



**Figure 8. Maintenance requirements on Fairview Rd Chainage 0 to 11.5 km for current traffic and additional HCV scenarios**

### Spur Road

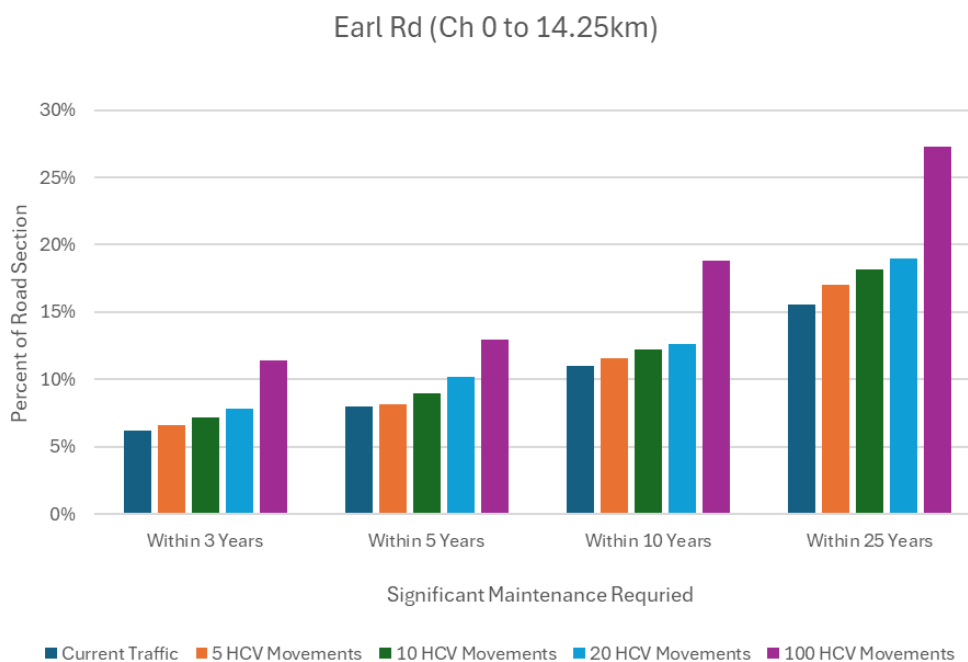
Spur Road is similar to Fairview Road, almost a third of it is already at “end of life” with current traffic as shown in Figure 9. The impact of development over and above this is gradual (up to 10% increased maintenance quantities) apart from in the 10 to 25-year maintenance horizon where this jumps up to 5 to 20% depending on the HCV scenario. This case is a useful reminder that the impact of development isn’t always linear with respect to time. Road sections with more strength/capacity will endure for longer without maintenance but may become problematic later.



**Figure 9. Maintenance requirements on Spur Rd Chainage 0 to 4.3 km for current traffic and additional HCV scenarios**

### Earl Road

According to the deflection data and Figure 10, Earl Road is in good condition with low forecasted maintenance spend quantities under the current traffic scenario. The impact of small development generated traffic of 5, 10 and 20 HCV movements per day is relatively minor. The large development case of 100 HCV movements per day shows a major shift of up to 10% increase in maintenance spend.



**Figure 10. Maintenance requirements on Earl Rd Chainage 0 to 14.25km for current traffic and additional HCV scenarios**



## Conclusion

Both network and specific case study analysis indicate that many roads within Timaru District Council's roading network have the potential to be significantly impacted by developments that generate heavy vehicle traffic.

At the network level, both small and large developments can have a significant impact on roads in the TDC network. A small development that generates an additional 5 HCV movements per day could significantly impact up to 30% of the network. A large development (100 HCV movements per day) could significantly impact nearly 50% of the network. Rural and lower volume (low volume, access and secondary collector) road categories are more vulnerable with a higher percentage of these road categories being affected.

A 5% increase in HCV (compared to current HCV volumes) results in 7% of the network being significantly impacted. Lower percent increases in HCV were shown to be trivial (<5% of the network is impacted) for most road sections. Therefore, it is recommended that a 5% increase in HCV compared to current road HCV is set to trigger the requirement for a detailed Pavement Impact Assessment. Alternatively, it is recommended to also trigger a Pavement Impact Assessment where vehicle individual, axle set or combined axle sets exceed standard vehicle limits for Class 1 roads as defined by NZTA (e.g. High Productivity Motor Vehicles).

Review of Taiko, Robinson, Fairview, Spur and Earl Roads as case studies reiterate the effect of additional heavy vehicle traffic on a variety of roads with different conditions. On stronger, usually higher volume roads, the net % effect on maintenance spend to support additional traffic is lower.

The quantum of significantly impacted roads in this report is considered lower bound as shown by the sensitivity case undertaken which expanded the definition of significantly impacted to pavements with less than 3 years remaining life.

## Applicability

This report has been prepared for the sole use of our client, Timaru District Council, with respect to the particular brief and on the terms and conditions agreed with our client. It may not be used or relied on (in whole or part) by anyone else, or for any other purpose or in any other contexts, without our prior review and written agreement.

Yours faithfully,

A handwritten signature in cursive script that reads 'Lily Grimshaw'.

Lily Grimshaw  
Pavements Consulting Team Leader  
GeoSolve Limited

Attachments: Appendix A: Detailed Analysis Methodology [3p]





## Appendix A: Calculations

### Deflection

Deflection data was acquired from the Falling Weight and TSD/LMD table from the Timaru District Council RAMM database. These were the raw measured values, which were then standardised to 566 kPa for a 40 kN load.

As the data provided was collected using FWD/LMD and the equation used to calculating remaining ESA is based on Benkelman Beam deflection, a deflection standardisation factor of 1.1 was used to convert the deflection values to equivalent Benkelman Beam values<sup>11</sup>. The LMD data had already been converted to equivalent FWD deflection, the FWD deflection standardisation factor was used instead of the TSD factor.

Pavement remaining ESA was calculated according to Austroads AGPT05-19: Pavement Evaluation and Treatment Design (pg 118-119) as a function of Benkelman Beam deflection.

Design traffic less than 10<sup>6</sup> ESA is calculated using Equation 1, which is rearranged to find N, the remaining traffic (ESA). This equation was used when the load and equipment standardised central deflection exceeded 1.34mm.

$$\text{Deflection} = 3.666 - 0.422 \log(\text{remainingESA}) \quad (1)$$

$$\text{RemainingESA} = 10^{\frac{\text{Deflection}-3.666}{-0.422}}$$

Traffic volumes of 10<sup>6</sup> ESA or more calculated using Equation 2, which is rearranged to find N. This equation was used when the load and equipment standardised deflection was less than 1.34mm.

$$\text{Deflection} = 0.731 + 91.202 \text{RemainingESA}^{-0.3924} \quad (2)$$

$$\text{RemainingESA} = \left( \frac{\text{Deflection} - 0.731}{91.2} \right)^{\frac{-1}{0.3924}}$$

### Traffic Demand

The annual number of equivalent standard axle loads is calculated using the relevant data available in RAMM according to Equation 3 below:

$$\begin{aligned} \text{Annual ESA} &= \text{AADT} * 365 \text{ Days Per Year} * 0.5 \text{ Directional Factor} \\ &* \text{Percent Heavy Vehicles} * \text{ESA per Heavy Vehicle} \end{aligned} \quad (3)$$

<sup>11</sup> Austroads 2019. AGPT05-19 Guide to Pavement Technology Part 5: Pavement Evaluation and Treatment Design, Table 9.2.



Where AADT is the annual average daily traffic measured or estimated from a nearby traffic count over the entire carriageway, 0.5 presumes that only half of this daily traffic is on the lane in question (two way carriageway), Percent Heavy Vehicles is the percentage of the AADT that are heavy vehicles as recorded in RAMM and ESA per Heavy Vehicle is the average number of equivalent standard axle loads per heavy vehicle.

### Current Remaining Life in Years

The current remaining life (years) for each FWD and LMD test location was calculated using the remaining ESA calculated by equation 1 or 2 and the Annual ESA traffic demand calculated in equation 3 as shown in Equation 4 below:

$$\text{Current remaining life (years)} = \frac{\text{Remaining ESA}}{\text{Annual ESA}} \quad (4)$$

### HCV Scenario Traffic Demand

The additional heavy vehicle traffic demand for each HCV scenario (5, 10, 20 and 100) was calculated using Equation 5 below, where n is the increase in HCV movements per carriageway per day:

$$nHCVESA = n * 2 \text{ ESA/HCV} * 365 \text{ days} * 0.5 \text{ Directional Factor} \quad (5)$$

### HCV Scenario Remaining Life

The remaining life of the FWD/LMD test location was calculated according to equation 6 below.

$$nHCV\text{Remaining Life} = \frac{\text{Remaining ESA}}{(\text{Annual ESA} + nHCVESA)} \quad (6)$$

### Financial Implications

An equation was developed to quantify the financial implications of moving road maintenance work forward in time. For example, a road may have a current remaining life of 40 years, but after the additional HCV traffic, this could reduce to 10 years. This is a significant decrease and means the maintenance work would need to be completed a lot sooner than expected. This classifies that road as significant. Whilst another road may have a current remaining life of 0 years, so the added HCV traffic will have no effect on it. Therefore, this road is not significant as maintenance would need to be completed anyway, regardless of the additional HCV traffic. This logic neglects the potential need to do more significant (deeper/thicker) maintenance to ensure the pavement meets both the current and demand traffic.

The cost of bringing work forward was calculated using the Single Payment Present Worth calculation. This was found using Equation 7 below, where n is the year from today that maintenance occurs and i is the interest rate of 6%:

$$SPPW = (1 + i)^{-n} \quad (7)$$



The Present Value Implication (PVI) for each road under each HCV scenario (n) could then be calculated using Equation 8 below, where n is the year from today that maintenance would have to occur:

$$nPVI = 100 * (SPPW(nHCVRemainingLife) - SPPW(Current Remaining life)) \quad (7)$$

### **Vulnerability**

From the remaining life values calculated for 5 and 100 heavy trucks per day, the vulnerability of each road could be found. This parameter describes the road's susceptibility to pavement distress and its likelihood that it will need maintenance in the next 25 years.

Roads were classed as vulnerable if their remaining life with development traffic was less than or equal to 25 years.

This ignores roads with very high remaining life in excess of 25 years.

### **Significance**

Significant financial implications are captured where the PVI is greater than 7%. This indicates that the remaining life from the added HCV traffic has reduced significantly from the current traffic remaining life. This means that these roads will require maintenance much sooner than expected. Roads with a current remaining life of 1 year or less will not trigger as significant as this results in a PVI of less than 7%.

### **Significant Impact**

Roads that were classed as both vulnerable and significant are defined as "significantly impacted" by development generated HCV traffic. This definition was used throughout the report to simplify the procedure for establishing the scale of the problem with respect to the roads on the TDC network.



**Auckland**

Level 1/70 Shortland Street  
Auckland 1010  
Aotearoa New Zealand

**Wellington**

Level 1/119-123 Featherston Street  
Wellington 6011  
Aotearoa New Zealand

**Christchurch**

Level 1/137 Victoria Street  
PO Box 36446, Merivale  
Christchurch 8146  
Aotearoa New Zealand

[hello@abley.com](mailto:hello@abley.com)

+64 3 377 4703

[abley.com](http://abley.com)