

A Step Change in Level Crossing Safety



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Safe Systems apply to Rail

Humans make mistakes

Humans are vulnerable

A shared responsibility
is required



New LCSIA process

- KiwiRail have endorsed a new procedure for assessing the risk for a new pedestrian or cycle facility over or parallel to the railway corridor. It is known as;

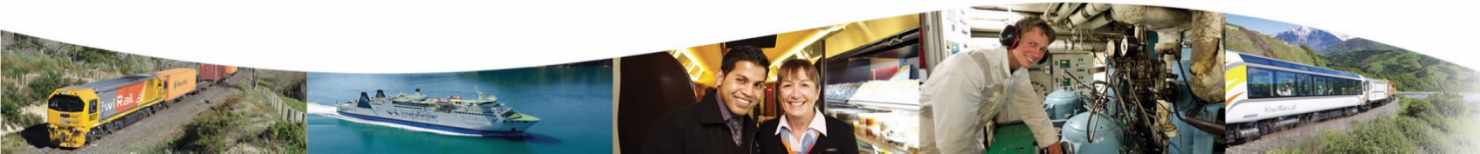
Level Crossing Safety Impact Assessment (LCSIA)

- Required to address the concerns raised by Coroners around some of the serious & fatal crashes over recent years
- A LCSIA is necessary when there is an change in an adjacent land activity that would affect the risk at a nearby level crossing.
 - Additional pedestrians and cyclists e.g. cycle-ways
 - Additional vehicles especially heavy vehicles
 - Additional trains

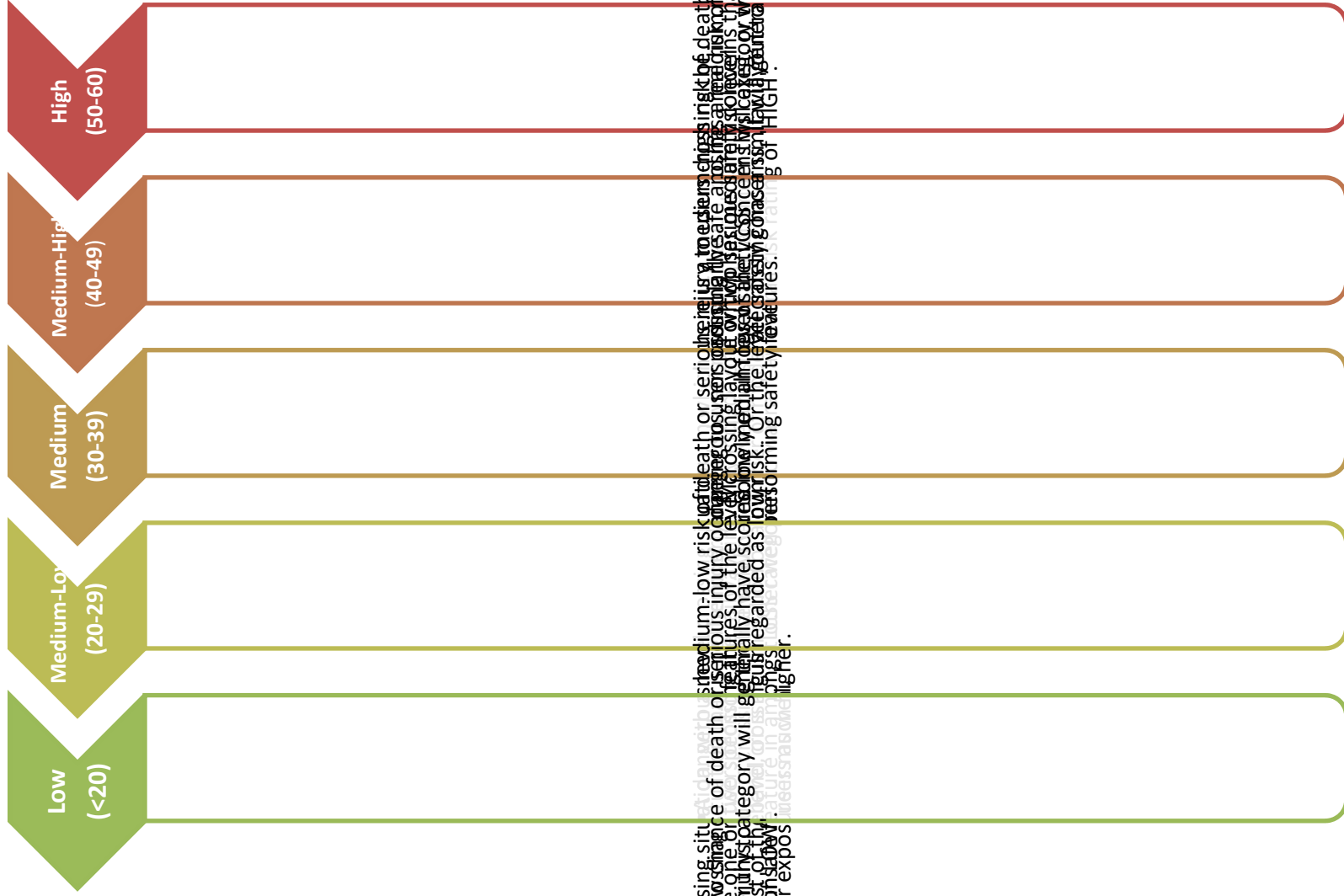


LCSIA – LCSS Score

- A Level Crossing Safety Score (LCSS) is used to determine the risk band of the level crossing.
- The LCSS consists of four elements and is scored out of 60 pts;
 1. ALCAM Score (30 pts)
 2. Crash & Incident History (10 pts)
 3. Site Specific Safety Score (SSSS) (10 pts)
 4. RCA & Locomotive Engineers Opinion (10 pts)



Overview of LCSIA process



LCSIA CRITERIA

- Two criteria to meet:

Criteria 1: the Level Crossing Safety Score (LCSS) of new & modified level crossings should be Low or Medium-Low.

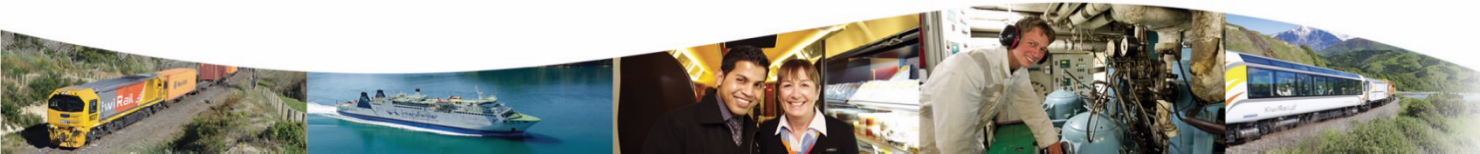
Criteria 2: the Level Crossing Safety Score (LCSS) of modified level crossings should be lower than the existing level crossing.

At higher volume crossings this often means that grade separation is required. This needs to pass the 'reasonably practicable' test. Next best option being a barrier option.



LCSIA process

- Selecting the team members (attended course)
- On-site
 - A site assessment of current conditions & safety concerns
 - Review of the proposed design (where provided)
 - Undertake Site Specific Safety Score (SSSS) Assessment
 - Obtain KiwiRail and RCA concerns and risk scores
- Desktop
 - Calculation of the LCSS for the existing and for the proposed design.
 - List of improvements / modifications.
 - If required undertake a LCSS assessment for the modified design
 - A recommendation on the necessary changes required at the crossing in order to achieve **Criteria 1** or **Criteria 2**



ALCAM Score

- From LXM database

ALCAM Jurisdiction Risk Band	LCSS (points)
High	25-30
Medium High	19-24
Medium	13-18
Medium Low	7-12
Low	1-6



Crash & Incident History

Scenario	IRIS Data	CAS Data	KiwiRAP Data	Total score
Shared path / pedestrian crossing	100% weighting (1 - 10 scale)	N/A	N/A	100% of the IRIS score
Road Score (when KiwiRAP score is available / calculated)	50% weighting (1 - 10 scale)	25% weighting (1 - 5 scale)	25% weighting (1 - 5 scale)	Sum the totals out of 20 and divide by 2 for score out of 10.
Road score (when KiwiRAP data is not available)	67% weighting (1 - 10 scale)	33% weighting (1 - 5 scale)	N/A	Sum the totals out of 15 and divide by 1.5 for a score out of 10



Site Specific Safety Score (SSSS)

- This site-based score aims to analyse elements of the layout that are not well covered or missing from ALCAM.
- EXAMPLE, Pedestrian crossing:

Assessed Item	Existing score	Comments
Crossing type and visibility	4/10	Excellent visibility with flashing lights only facing in one direction.
Flange gap wheel entrapment	5/5	Bad flange gaps that a wheeled pedestrian could become trapped. Low pedestrian volumes to assist trapped user.
Proportion of vulnerable users	2/10	Low number of vulnerable users.
Distraction/Inattention	1/5	Peri-urban with pedestrian crossing with low pedestrian volume.
Cycle Patronage	0/5	No evidence of cyclists using the crossing.
TOTAL SCORE	12/35	MEDIUM-LOW risk pedestrian crossing
MODIFIED SCORE	12/35	No modification recommended



Locomotive Engineer & RCA Engineer Risk Score

- This score reflects the level of risk that locomotive engineers (train drivers) and road controlling authority (RCA) engineers give to each railway crossing compared with other crossings they encounter regularly.
- A separate score is required for the road crossing and the pedestrian crossings. Both engineers' rate the crossing out of five points, with the totals combined for a score out of ten.

	Existing	Proposed	Modified
Risk score for level crossing	7/10	4/10	4/10
Risk score for southern shared path crossing	7/10	7/10	6/10
Risk score for northern pedestrian crossing	7/10	5/10	5/10



Level Crossing Safety Score

- The four elements are combined to produce the LCSS

Scored Items	Existing Score	Proposed Score	Modified Score	Future Score	Comments
ALCAM score	24/30	24/30	18/30	24/30	Automatic gates lowered risk in modified, however future user numbers pushes the risk back up.
Crash and incident history score	1/10	1/10	1/10	1/10	One IRIS record for pedestrians.
Site specific safety score	2/10	2/10	2/10	2/10	No major concerns at the site.
Locomotive engineer / RCA engineer risk score	6/10	4/10	4/10	4/10	Rated higher by RCA Engineer than locomotive engineer.
LCSS SCORE	33/60	31/60	25/60	31/60	
RISK BAND	Medium	Medium	Medium Low	Medium	





WX40 acute to left



WX41 right angles



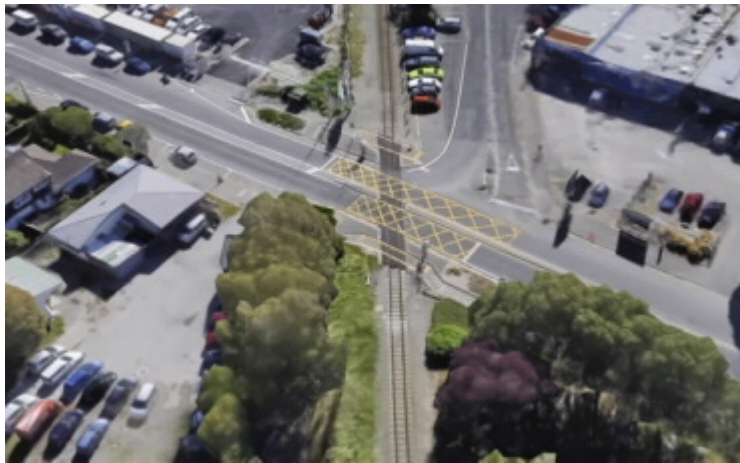
WX42 acute to right

TWO LCSIA EXAMPLES



Harewood – Current Safety Issues

1. Width of Flange Gaps
2. Pedestrians & Cyclists walking along tracks
3. No Flashing lights facing all directions
4. No Rail-X Markings



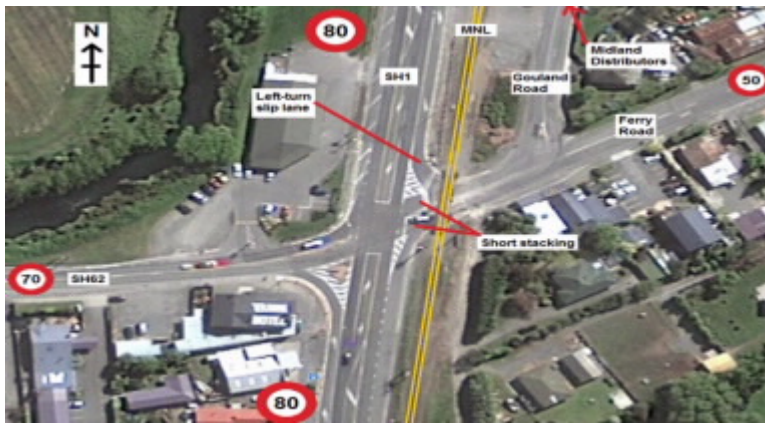
Harewood – Proposed Design Issues

1. No Automatic Gates or
2. No Maze
3. Unclear if flashing lights on all approaches
4. Where will Hoops be provided
5. Signage upgrades missing
6. No Rail-X marking provided
7. Fencing of corridor



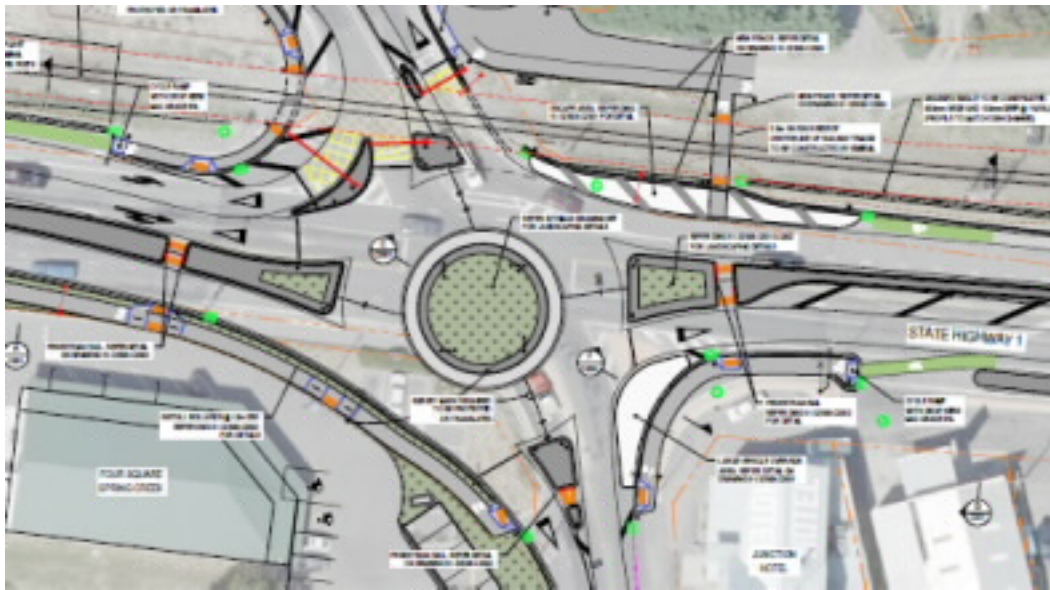
Ferry Road – Current Issues

1. Short Stacking on Ferry Road
2. No footpath on northern side
3. No barrier arms (HAB)
4. Faded yellow marking
5. Pedestrian environment poor (with railway line and then crossing SH2)



Ferry Road – Proposed Design

1. Still have short stacking issue
2. Need pedestrians flashing lights in all directions
3. Need Rail-X marking on Ferry Rd approach (sun)
4. Need Rail-X marking on LTSL
5. Northern pedestrians crossing has poor alignment
6. Hazard of FLB & HAB on small LTSL splitter island



Key Issues

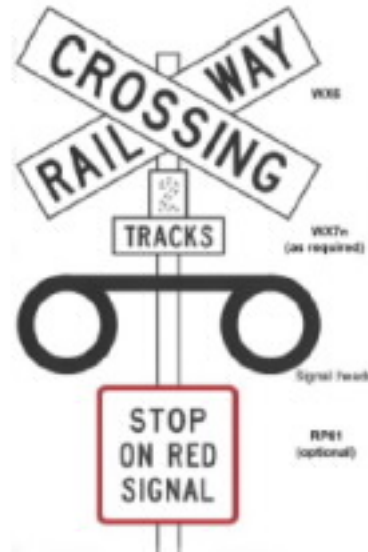
- ALCAM Assessments:
 - Lack of pedestrian and cycle count data
 - Lack of data on types of pedestrians and cyclists
 - Errors in sight lines, train details and other data
- Other
 - Movements/desire-lines of pedestrians/cyclists
 - Site constraints making it difficult to achieve designs
 - Second train coming – shunts & railway stations
 - ‘Grounding out’ and ‘flange gaps’
 - Impact of distraction – flashing lights in both directions
 - Different control types for vehicles and pedestrians



Any Questions?



WX3



WA1

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