

Appendix A Mitigation assessment matrices

NZS 6806 – Assessment matrix

Project		Assessment area						
PP20		A - North of Otaki Ramp						
Assesment criteria	Discipline	Issues / Risks	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6
Consistency with NZ urban design protocol, Project Objectives and project specific ULDF	Urban design	<ul style="list-style-type: none"> Located at edge of urban / rural area within a context of a dunescape. New expressway located in partial cut. Noise walls in urban areas create CPTED / graffiti issues 	-- Inserts additional structure into the topography / context.	--- Large additional structure required and due to its height this would be very dominant in the local rural/residential context.	++ No additional structures required to impact on topography or visual context	-- Inserts additional structure into the topography / context.		
Value for money, including maintenance costs and consideration of benefit cost analysis	Acoustics	All options have a favorable BCR	+++ A BCR of 2.1 is estimated for this option	+++ A BCR of 2.1 is estimated for this option	+++ A BCR of 2.1 is estimated for this option	+++ A BCR of 1.5 is estimated for this option		
Compliance with NZS 6806 noise criteria	Acoustics	Several PPFs are affected by road-traffic noise from the local road north of the ramp, which are unable to be mitigated	+ 3 x Cat B	+ 2 x Cat B	+ 2 x Cat B	+ 2 x Cat B		
Achievement of the NZS 6806 structural mitigation performance standards	Acoustics	Due the density of PPFs a high BCR is achieved despite only a modest decrease in noise level.	- Topography limits the effectiveness of noise barriers, but 3dB in some instances	- Topography limits the effectiveness of noise barriers, but 6-7dB in some instances	- PPFs facing expressway decrease 3-4dB	- Topography limits the effectiveness of noise barriers		
Requirement for building-modification measures	Acoustics	There are no Cat C PPFs therefore no building modification will be required	+++	+++	+++	++		
Difference in cost compared to Transit's Guidelines (criteria for NZTA internal monitoring purposes)	Acoustics	The Transit solution required both PA-10 and 3m high barriers	+++	+++	+++	o This is the Transit solution		
Effect of changes to the existing noise environment	Acoustics	The PPFs in this area already experience a significant level of road-traffic noise in this area. The do-minimum scenario will result in through-traffic shifting to the e'way	o	o	o	o		
Potential effects on known heritage or cultural values	Cultural		-	-	-	-		
Potential effects on areas of significant indigenous vegetation and significant habitats of indigenous fauna	Ecology	Otaki railway wetland. Already substantially impacted by the road. Unlikely to be further significantly affected by proposed noise barriers. The damage is already done by the road.	o	o	o	o		
Potential effects on known heritage or cultural values	Heritage	potential for subsurface archaeological deposits to be located during works	-	-	-	-		
Road users' views to the surrounding landscape and key features/ locations in particular	Visual and landscape	No key views from Area A	- 'wall' would not be in context; bund could be	--- high wall' definitely not in context; 3m bund + 2m wall could be more readily intergrated	o N/A	o N/A		
Maintenance or enhancement of visual amenity for surrounding residents	Visual and landscape	Screen planting proposed for top of batter towards North Otaki housing	- Positive aspect of screening e'way from residents	- Positive aspect of screening residents from e'way; higher 'wall' would screen more...	o N/A	o N/A		
Availability of sufficient land for construction and maintenance and the extent to which NZTA would need to acquire land, or interests in land	Property	- Requiring additional land from landowners	- Additional land required for barrier.	- Additional land required for barrier.	o No additional property requirement	- Additional land required for barrier.		
Constructability/technical feasibility	Structures	5m high walls may be too high to be econmic	o 3m high noise wall	-- 5 m high noise wall	+ PA-10 to expressway	+ PA-10, 3m high barriers		
Compliance with relevant safety standards and guidelines	Structures	probably no issues here. All solutions 'safe'	o 3m high noise wall	o 5 m high noise wall	o PA-10 to expressway	o PA-10, 3m high barriers		

NZS 6806 – Assessment matrix

Project		Assessment area						
PP20		B - Main Street, Otaki						
Assesment criteria	Discipline	Issues / Risks	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6
Consistency with NZ urban design protocol, Project Objectives and project specific ULDF	Urban design	<ul style="list-style-type: none"> Located in urban area adjacent to existing residential dwellings to the west. Noise walls in urban areas can create CPTED / graffiti issues. 	<p>o</p> <p>Domestic scale fence/barrier equivalent to existing.</p>	<p>+</p> <p>Provides more options regarding fencing / planting to residential boundaries.</p>				
Value for money, including maintenance costs and consideration of benefit cost analysis	Acoustics	Main Street will become a local road and KCDC will be responsible for the maintenance of road surfaces	<p>+++</p> <p>Upgrading the existing fence with an acoustically effective barrier provides significant benefit for little cost. A BCR of 2.5 is estimated</p>	<p>+++</p> <p>A BCR of 1.9 is estimated for this option</p>				
Compliance with NZS 6806 noise criteria	Acoustics	The reduction in traffic between do-nothing and do-minimum moved 4 PPFs from Cat C to Cat B. All other PPFs are Cat A	<p>++</p> <p>The 2-story PPF remains Cat B</p>	<p>+++</p> <p>All Cat A</p>				
Achievement of the NZS 6806 structural mitigation performance standards	Acoustics		<p>++</p> <p>Average 4dB reduction</p>	<p>+</p> <p>Average 3dB reduction</p>				
Requirement for building-modification measures	Acoustics	There are no Cat C PPFs therefore no building modification will be required	<p>+++</p>	<p>+++</p>				
Difference in cost compared to Transit's Guidelines (criteria for NZTA internal monitoring purposes)	Acoustics	The Transit solution is the do-minimum scenario	<p>---</p>	<p>---</p>				
Effect of changes to the existing noise environment	Acoustics	The noise environment will improve due to traffic shifting to the expressway	<p>++</p>	<p>+++</p>				
Potential effects on known heritage or cultural values	Cultural		<p>-</p>	<p>-</p>				
Potential effects on areas of significant indigenous vegetation and significant habitats of indigenous fauna	Ecology	No significant indigenous vegetation or fauna present in affected areas.	<p>o</p>	<p>o</p>				
Potential effects on known heritage or cultural values	Heritage	potential for subsurface archaeological deposits to be located during works	<p>-</p>	<p>-</p>				
Road users' views to the surrounding landscape and key features/ locations in particular	Visual and landscape	Area B visually totally separate from e'way. No key views affected...	<p>o</p> <p>Too distant to notice...</p>	<p>o</p> <p>N/A</p>				
Maintenance or enhancement of visual amenity for surrounding residents	Visual and landscape	Assume mitigation measure would be a timber fence or the like, therefore would have same appearance as a standard suburban boundary fence...	<p>+</p> <p>fence' would be in context with suburbia; would screen residences from local arterial; expressway not visible...</p>	<p>o</p> <p>N/A</p>				
Availability of sufficient land for construction and maintenance and the extent to which NZTA would need to acquire land, or interests in land	Property	-Affecting properties which would be otherwise physically unaffected	<p>-</p> <p>Will potentially require agreement with property owners to replace existing fences on properties which are otherwise unaffected.</p>	<p>o</p> <p>No additional property requirement</p>				
Constructability/technical feasibility	Structures	Access close to boundry might be problematic otherwise no other risk	<p>+</p> <p>2 m high barrier</p>	<p>+</p> <p>Asphaltic concrete</p>				
Compliance with relevant safety standards and guidelines	Structures	Probably no issues here. All solutions 'safe'	<p>o</p> <p>2 m high barrier</p>	<p>o</p> <p>Asphaltic concrete</p>				

NZS 6806 – Assessment matrix

Project		Assessment area						
PP20		C - 230 Main Highway, Otaki						
Assesment criteria	Discipline	Issues / Risks	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6
Consistency with NZ urban design protocol, Project Objectives and project specific ULDF	Urban design	<ul style="list-style-type: none"> Located to rear of urban area shopping precinct in rail/expressway corridor. Generally open topography with large trees and stream to western edge. Pedestrian route to rail station along edge of rail corridor is critical CPTED issue Noise walls in urban areas can create CPTED / graffiti issues. 	<p>---</p> <p>Large scale barrier required at edge of rail is overscaled relative to general topography/ context, it cuts across natural stream path and in an urban area will have CPTED / graffiti issues</p>	<p>--</p> <p>Smaller barrier to western edge of expressway but short section is visually inconsistent and in an urban area will have CPTED / graffiti issues</p>	<p>++</p> <p>No additional structures required</p>			
Value for money, including maintenance costs and consideration of benefit cost analysis	Acoustics	Providing structural mitigation for a single PPF provides poor value for money	<p>---</p> <p>BCR = 0.13</p>	<p>---</p> <p>BCR = 0.13</p>	<p>---</p> <p>BCR = 0.15</p>			
Compliance with NZS 6806 noise criteria	Acoustics	Mitigation has been designed to achieve Cat A for the sole PPF	<p>+++</p>	<p>+++</p>	<p>+++</p>			
Achievement of the NZS 6806 structural mitigation performance standards	Acoustics		<p>o</p>	<p>o</p>	<p>o</p>			
Requirement for building-modification measures	Acoustics	There are no Cat C PPFs therefore no building modification will be required	<p>+++</p>	<p>+++</p>	<p>+++</p>			
Difference in cost compared to Transit's Guidelines (criteria for NZTA internal monitoring purposes)	Acoustics		<p>---</p>	<p>o</p> <p>This is the Transit solution</p>	<p>--</p>			
Effect of changes to the existing noise environment	Acoustics	The PPF is currently effected by traffic on Main Street	<p>o</p>	<p>o</p>	<p>o</p>			
Potential effects on known heritage or cultural values	Cultural		<p>-</p>	<p>-</p>	<p>-</p>			
Potential effects on areas of significant indigenous vegetation and significant habitats of indigenous fauna	Ecology	No significant indigenous vegetation or fauna present in affected areas.	<p>o</p>	<p>o</p>	<p>o</p>			
Potential effects on known heritage or cultural values	Heritage	potential for subsurface archaeological deposits to be located during works	<p>-</p>	<p>-</p>	<p>-</p>			
Road users' views to the surrounding landscape and key features/ locations in particular	Visual and landscape	Fleeting view of Otaki Railway Station could be obscured by e'way edge option; otherwise, no particular key views... Landscape planting proposed for 'land-locked' area between e'way and rail.	<p>-</p> <p>Setback from e'way will balance out height...</p>	<p>-</p> <p>Proximity of a 'wall' to e'way would be a negative; a bund could be integrated...</p>	<p>o</p> <p>N/A</p>			
Maintenance or enhancement of visual amenity for surrounding residents	Visual and landscape	No particular 'residential' views towards e'way	<p>--</p> <p>Height and bulk could be an issue; need to 'tie-in' with shared pathway...</p>	<p>o</p> <p>Separated/isolated from residences/public walkways...</p>	<p>o</p> <p>N/A</p>			
Availability of sufficient land for construction and maintenance and the extent to which NZTA would need to acquire land, or interests in land	Property	- Requiring additional land from landowners	<p>-</p> <p>May be required to purchase land to install and maintain noise barrier</p>	<p>o</p> <p>No additional property requirement as barrier would be between expressway and rail corridor.</p>	<p>o</p> <p>No additional property requirement</p>			
Constructability/technical feasibility	Structures	5m high walls may be too high to be econmic	<p>--</p> <p>5 m high barrier</p>	<p>o</p> <p>3 m high barrier</p>	<p>+</p> <p>Ogpa</p>			
Compliance with relevant safety standards and guidelines	Structures	Probably no issues here. All solutions 'safe'	<p>o</p> <p>5 m high barrier</p>	<p>o</p> <p>3 m high barrier</p>	<p>o</p> <p>Ogpa</p>			

NZS 6806 – Assessment matrix

Project		Assessment area						
PP20		D - East Otaki						
Assesment criteria	Discipline	Issues / Risks	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6
Consistency with NZ urban design protocol, Project Objectives and project specific ULDF	Urban design	<ul style="list-style-type: none"> Located in residential/lifestyle block area and rail/expressway corridor. Generally open topography. Noise walls in these areas can create CPTED / graffiti issues. Depends on treatment selected for Areas A & C. 	-- Barrier to eastern edge of expressway in only short sections is visually inconsistent and in an urban area will have CPTED / graffiti issues	++ No additional structures required and consistent with topography. Depends on treatment selected for Area's A & C.	-- Barrier to eastern edge of expressway in only short section is visually inconsistent and in an urban area will have CPTED / graffiti issues			
Value for money, including maintenance costs and consideration of benefit cost analysis	Acoustics		- A BCR of 0.7 is estimated	- A BCR of 0.7 is estimated	- A BCR of 0.6 is estimated			
Compliance with NZS 6806 noise criteria	Acoustics	Without mitigation there are 3x Cat B PPFs	+	+	+			
Achievement of the NZS 6806 structural mitigation performance standards	Acoustics		-- Barriers provide minimal attenuation	-	-			
Requirement for building-modification measures	Acoustics	There are no Cat C PPFs therefore no building modification will be required	o	o	o			
Difference in cost compared to Transit's Guidelines (criteria for NZTA internal monitoring purposes)	Acoustics		+++	++	o This is the Transit solution			
Effect of changes to the existing noise environment	Acoustics	The project will result in traffic from Main Street being diverted to the expressway, which is significantly closer to the PPFs on Rahui and County Roads	--	--	--			
Potential effects on known heritage or cultural values	Cultural		+++	-	-			
Potential effects on areas of significant indigenous vegetation and significant habitats of indigenous fauna	Ecology	No significant indigenous vegetation or fauna present in affected areas.	o	o	o			
Potential effects on known heritage or cultural values	Heritage	potential for subsurface archaeological deposits to be located during works	+++ noise barrier would not only reduce noise but visually sheild view of road from building	-	-			
Road users' views to the surrounding landscape and key features/ locations in particular	Visual and landscape	No key views from e'way; any buildings of interest are screened by existing vegetation	-- Proximity of a 'wall' to e'way would be a negative; a bund could be integrated...	o N/A	- Proximity of a 'wall' to e'way would be a negative; a bund could be integrated... Less effect than Option 1 as less wall/bund...			
Maintenance or enhancement of visual amenity for surrounding residents	Visual and landscape	Landscape/screen planting proposed for area between e'way and County Road	++ Positive aspect of screening e'way from residents	o N/A	+ Positive aspect of screening e'way from residents, but a bit less so than Option 1			
Availability of sufficient land for construction and maintenance and the extent to which NZTA would need to acquire land, or interests in land	Property	- Requiring additional land from landowners	- Additional land required for barrier	o No additional property requirement	o No additional property requirement as barrier would be placed on former railway alignment			
Constructability/technical feasibility	Structures	No major risks	o 3 m high barrier	+ Ogpa	+ Quiet surfaces etc			
Compliance with relevant safety standards and guidelines	Structures	Probably no issues here. All solutions 'safe'	o 3 m high barrier	o Ogpa	o Quiet surfaces etc			

NZS 6806 – Assessment matrix

Project		Assessment area						
PP20		E - Otaki Gorge to Te Horo (West)						
Assesment criteria	Discipline	Issues / Risks	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6
Consistency with NZ urban design protocol, Project Objectives and project specific ULDF	Urban design	<ul style="list-style-type: none"> Located in rural area with rail/expressway corridor running through on straight adjacent alignment. Generally open and flat topography. Large vertical structures can look out of place in this rural context. 	-- Large additional structure required and due to its length this could be dominant in the wider topography / context.	--- Large additional structures required and due to its height this would be very dominant in the local rural/residential context. Intermitent barriers also seems out of context.	+ No additional structures required and consistant with topography/context.	+ No additional structures required and consistent with topography/context. No comment on cost BCR of OGPA on both local arterial and expressway.		
Value for money, including maintenance costs and consideration of benefit cost analysis	Acoustics	All options have low BCRs, however Options 3 and 4 improve when considering benefits to Area F	--	--	--	--		
Compliance with NZS 6806 noise criteria	Acoustics	PPFs to the West are subject to altered road criteria	+ All Cat A	+	++	+++		
Achievement of the NZS 6806 structural mitigation performance standards	Acoustics		-	-	-	+		
Requirement for building-modification measures	Acoustics	There are no Cat C PPFs therefore no building modification will be required	o	o	o	o		
Difference in cost compared to Transit's Guidelines (criteria for NZTA internal monitoring purposes)	Acoustics	The Transit solution is do-minimum	---	---	---	---		
Effect of changes to the existing noise environment	Acoustics	The PPFs in this area already experience a significant level of road-traffic noise in this area. The do-minimum scenario will result in through-traffic shifting to the expressway	+	+	++	+++		
Potential effects on known heritage or cultural values	Cultural		-	-	-	-		
Potential effects on areas of significant indigenous vegetation and significant habitats of indigenous fauna	Ecology	Te Waka Bush – regionally significant stand of bush at junction between Te Waka Road and SH1.	o	-- Potential for loss of mature trees and significant plant species from edge of bush depending upon precise location of noise barrier.	o	o		
Potential effects on known heritage or cultural values	Heritage	potential for subsurface archaeological deposits to be located during works	-	-	-	-		
Road users' views to the surrounding landscape and key features/ locations in particular	Visual and landscape	Broad, open rural western views thru gaps in highway edge vegetation are part of the character of Te Horo Straight; noise mitigation measures could conflict with this...	--- There's miles of it!!! No space for 3m high bund; possibly could be bund + fence; too enclosing of e'way... Highly monotonous	--- 5m 'wall' would be totally out of context... Wall or bund + wall would blitz existing highway frontage plantings... Setback from e'way may lessen effect a bit...	o N/A	o N/A		

Project	Assessment area
PP20	E - Otaki Gorge to Te Horo (West)

Assesment criteria	Discipline	Issues / Risks	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6
Maintenance or enhancement of visual amenity for surrounding residents	Visual and landscape	Most properties/residences west of SH1 already have planted screening between road and house. Constructing/installing noise mitigation on east edge of SH1 will impact on this...	-- For the most part, residential views to e'way are already screened by existing vegetation. Setback of 'central', linear mitigation measure would limit effect on residences...	--- Wall or bund + wall would blitz existing highway frontage plantings... Any 'positives' in terms of screening would be negated by effect on existing highway edge vegetation...	o N/A	o N/A		
Availability of sufficient land for construction and maintenance and the extent to which NZTA would need to acquire land, or interests in land	Property	- Requiring additional land from landowners	o No additional property requirement as barrier would sit between expressway and rail corridor.	- May be required to purchase land to install and maintain noise barrier	o No additional property requirement	o No additional property requirement		
Constructability/technical feasibility	Structures	5m high walls may be too high to be econmic	o 3 m high barrier	-- 5 m high barrier	+ Ogpa	o Ogpa plus		
Compliance with relevant safety standards and guidelines	Structures	Probably no issues here. All solutions 'safe'	o 3 m high barrier	o 5 m high barrier	o Ogpa	o Ogpa plus		

NZS 6806 – Assessment matrix

Project		Assessment area						
PP20		F - Otaki Gorge to Te Horo (East)						
Assesment criteria	Discipline	Issues / Risks	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6
Consistency with NZ urban design protocol, Project Objectives and project specific ULDF	Urban design	<ul style="list-style-type: none"> Located in rural area with rail/expressway corridor running through on straight adjacent alignment. Generally open and flat topography. Large vertical structures can look out of place in this rural context. 	-- Large additional structure required and due to its length and intermitent application this could be dominant in the wider topography / context.	--- Large additional structures required and due to its height this would be very dominant in the local rural/residential context. Intermitent barriers also seems out of context.	+ No additional structures required and consistant with topography/context.	-- Large additional structures required and due to its height this would be very dominant in the local rural/residential context. Intermitent barriers also seems out of context.		
Value for money, including maintenance costs and consideration of benefit cost analysis	Acoustics	All options have a low BCR.	---	---	---	--	---	
Compliance with NZS 6806 noise criteria	Acoustics		+ 10xCat B	+ 9xCat B	+ 9xCat B	- 13xCat B + 2xCat C	+ 13x Cat B	
Achievement of the NZS 6806 structural mitigation performance standards	Acoustics		-	-	o		-	
Requirement for building-modification measures	Acoustics	There are 2xCat C properties in the do-minimum scenario. It is the NZTA's preference for structural mitigation to be implemented within the road reserve	o	o	o	--- 2xPPFs will require building modification	o	
Difference in cost compared to Transit's Guidelines (criteria for NZTA internal monitoring purposes)	Acoustics		-	---	---	+++	o This is the Transit solution	
Effect of changes to the existing noise environment	Acoustics	The PPFs in this area already experience a level of road-traffic noise in this area. The expressway alignment will bring traffic closer to the PPFs	-	-	-	-	-	
Potential effects on known heritage or cultural values	Cultural		-	-	-	-		
Potential effects on areas of significant indigenous vegetation and significant habitats of indigenous fauna	Ecology	Hautere Bush F potentially further impacted by noise walls on some options.	-- Potentially further loss of mature native trees from Hautere Bush F.	-- Potentially further loss of mature native trees from Hautere Bush F.	o	o		
Potential effects on known heritage or cultural values	Heritage	potential for subsurface archaeological deposits to be located during works	-	-	-	-		
Road users' views to the surrounding landscape and key features/ locations in particular	Visual and landscape	Views to clusters of vegetation to the east provide a degree of positive amenity and are one of the few 'key features' of the local landscape...	--- Unlikely to be room for a 3m bund; so assume 'wall'; long sections would be enclosing and monotonous; shading issues re no early morning sun??? Views to bush remnants will be obscured, which would be a loss to the driving experience...	--- definitely no room for a bund east of swale; 5m 'wall' definitely out of context; construction would impact on bush remnants Views to bush remnants will definitely be obscured, which would be a loss to the driving experience...	o N/A	o N/A	-- Lots of bits of bunds + bunds and walls are probably better than long/continous sections of bund/wall... Walls would be out of context, but could be integrated via landscape planting if there is space to do so... Views to bush remnants likely to be obscured, which would be a loss to the driving experience...	

Project	Assessment area
PP20	F - Otaki Gorge to Te Horo (East)

Assessment criteria	Discipline	Issues / Risks	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6
Maintenance or enhancement of visual amenity for surrounding residents	Visual and landscape	Positives of screening vs. negatives of shading???	-- Debatable whether screening e'way is better than 'enclosing' effect on residences/properties that a bund or bund and wall may have. Potential shading/blocking sun vs westerly windbreak is also debatable... Most residences to the east of e'way have planting on their western flank but much of this may be lost to e'way construction...	-- Same type of effects as f Option 1 but more so due to greater height and/or greater footprint...	o N/A	o N/A	- Similare to F option 1, but less linear extent so less effect...	
Availability of sufficient land for construction and maintenance and the extent to which NZTA would need to acquire land, or interests in land	Property	- Requiring additional land from landowners	o No additional property requirement as barrier would sit between expressway and rail corridor.	- May be required to purchase land to install and maintain noise barrier	o No additional property requirement	- May be required to purchase land to install and maintain noise mitigation	- May be required to purchase land to install and maintain noise barrier	
Constructability/technical feasibility	Structures	5m high walls may be too high to be econmic. Building modications can be expensive and problimatic.	o 3 m high barrier	-- 5 m high barrier	+ Ogpa	-- Building mods	-- combination 1 –4	
Compliance with relevant safety standards and guidelines	Structures	Modifying buildings can be dangerous	o 3 m high barrier	-- 5 m high barrier	o Ogpa	-- Building mods	-- combination 1 –4	

NZS 6806 – Assessment matrix

Project		Assessment area						
PP20		G - South of Marycrest						
Assesment criteria	Discipline	Issues / Risks	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6
Consistency with NZ urban design protocol, Project Objectives and project specific ULDF	Urban design	<ul style="list-style-type: none"> Located in rural area with rail/expressway corridor running through on straight adjacent alignment. Generally open topography sloping down east to west towards dunescape. Large vertical structures can look out of place in this rural context. 	-- Large additional structure required and due to its length and intermittent application this could be dominant in the wider topography / context.	--- Large additional structures required and due to its height this would be very dominant in the local rural/residential context. Intermittent barriers also seems out of context.	+ No additional structures required and consistant with topography/context.	-- Large additional structure required and due to its length and intermittent application this could be dominant in the wider topography / context.		
Value for money, including maintenance costs and consideration of benefit cost analysis	Acoustics	All options have a very low BCR	--- BCR = 0.10	--- BCR = 0.18	--- BCR = 0.10	--- BCR = 0.07		
Compliance with NZS 6806 noise criteria	Acoustics	6xCat B for Do–minimum (new road).	+ 5xCat B	+ 4xCat B	+ 4xCat B	+ 6xCat B		
Achievement of the NZS 6806 structural mitigation performance standards	Acoustics		-- Topography limits the effectiveness of noise barriers	- Topography limits the effectiveness of noise barriers	- Contributions from the local road limit the effectiveness of PA-10 to the expressway	-- Topography limits the effectiveness of noise barriers		
Requirement for building-modification measures	Acoustics	There are no Cat C PPFs therefore no building modification will be required	o	o	o	o		
Difference in cost compared to Transit's Guidelines (criteria for NZTA internal monitoring purposes)	Acoustics		---	---	---	o This is the Transit solution		
Effect of changes to the existing noise environment	Acoustics	PPFs are currently exposed to traffic noise however this will increase with the expressway. All PPFs would meet the criterion for Cat A (Altered Road).	o	o	o	o		
Potential effects on known heritage or cultural values	Cultural		-	-	+++	-		
Potential effects on areas of significant indigenous vegetation and significant habitats of indigenous fauna	Ecology	Area of bush on the Stevens Property potentially further impacted by noise walls on some of the options.	-- Potentially further loss of mature native trees from the area of bush on the Stevens Property.	-- Potentially further loss of mature native trees from the area of bush on the Stevens Property.	o	o		
Potential effects on known heritage or cultural values	Heritage	potential for subsurface archaeological deposits to be located during works	-	-	+++ area identified as high risk in	-		
Road users' views to the surrounding landscape and key features/ locations in particular	Visual and landscape	Marycrest 'duneland' provides some landscape and visual diversity so need to avoid obscuring this..	[query need for southern and northern extent of 3m high mitigation as realigned 'local arterial' forms two sections of fill bund and is then in cut to immediate west of e'way]		N/a			
Maintenance or enhancement of visual amenity for surrounding residents	Visual and landscape	Majority of residences west of e'way already enclosed by existing vegetation/plantings			o N/A			

Project	Assessment area	
PP20	G - South of Marycrest	

Assessment criteria	Discipline	Issues / Risks	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6
Availability of sufficient land for construction and maintenance and the extent to which NZTA would need to acquire land, or interests in land	Property	- Requiring additional land from landowners	o No additional property requirement as barrier would sit between expressway and rail corridor.	o No additional property requirement as barrier would sit between expressway and rail corridor.	o No additional property requirement	o No additional property requirement		
Constructability/technical feasibility	Structures	5m high walls may be too high to be economic.	o 3 m high barrier	-- 5 m high barrier	+ Ogpa	o 3m barriers to limited segs		
Compliance with relevant safety standards and guidelines	Structures	Probably no issues here. All solutions 'safe'	o 3 m high barrier	o 5 m high barrier	o Ogpa	o 3m barriers to limited segs		



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