



## Notes on Appendix A

The appendix contains the following:

- Land use and growth assumptions;
- Key urban design definitions; and
- Transport options assessment:
  - SH 1 widening
  - SH1 widening + heavy vehicle bypass
  - Short eastern bypass
  - Long eastern bypass

## Growth assumptions

### GENERAL GROWTH ASSUMPTIONS

#### Household capacity

Currently Woodend household capacity is 2.7 people per household. By 2041 the Waimakariri District average is expected to be 2.34 people per household. This figure is in accordance with the UDS and has accordingly been used in all growth calculations.

#### Density

The number of household units per hectare. For all Waimakariri greenfield areas a density of 10hh/ha (households per hectare) has been used in accordance with the target densities identified for Waimakariri greenfield areas within the UDS.

#### Gross density

The number of household units per hectare *including* land for:

- all open space and on-site parking associated with residential development;
- Local roads and roading corridors including pedestrian and cycleways but excluding State Highways and major arterial roads; and
- Local open space reserves

#### Net density

The gross density less 30% to exclude open space and roads. It is noted that land use options have been formulated using a net density of 10hh/ha.

#### Flexibility

20% flexibility has been used for projected households and land areas to account for:

- Development inefficiencies;
- Market flexibility and competition;
- Strategic land banking;
- Growth occurring faster than anticipated.

### RESIDENTIAL GROWTH ALLOCATIONS

Residential growth allocations and sequencing reflect the UDS household projections for Woodend adopted by WDC. This includes:

#### Additional households

1,235 additional households in new development areas excluding any infill of existing residential areas and development in zoned but vacant residential land.

#### Projected additional population

A total of 2,890 additional residents by 2041 based on a total projected population of 5,500 and existing population of 2,610 persons.

## Land use assumptions

### COMMERCIAL PROVISION

Approximately 3ha of new commercial land for fine grain retail / office space / mixed use (residential) has been provided to the existing 3ha commercial area in the village centre to the east of SH 1 and along a portion of Eders Road adjacent to the SH.

This additional commercial area seeks to provide for future commercial capacity in the existing centre to meet local retail demands driven by the increased number of permanent residents.

It is noted that this area is indicative only and designed in accordance with the following urban design principles:

- Strengthen existing retail core along SH1 in terms of its continued convenience shopping function;
- Approximately 2m<sup>2</sup> of retail floor space is appropriate for each new resident in Woodend;
- Provide for development along main movement routes with convenient access;
- Provide opportunities for local shops, commercial use and community amenities to continue centre viability;
- Provide long term opportunities for introduction of residential to the village centre.

### INDUSTRIAL PROVISION

Light industrial/servicing activities have been provided to service the needs of the future population of both Woodend and Pegasus as the area matures. This provision is indicative only and not based on resolved land use quantities and demands.

As rural land with lower land values are rezoned, providing for a reasonable allowance of business / industrial / servicing land on land not ideally suited

for residential activities is considered sensible.

The land uses have been located to meet the following urban design principles:

- To ensure sufficient and appropriately zoned and serviced land for less attractive land uses and non-retail uses to support Woodend and Pegasus business growth;
- To support an appropriate mix of compatible land uses;
- To ensure compatible neighbouring activities and methods to reduce reverse sensitivities;
- To be located on main movement routes to maximise accessibility.

## COMMUNITY PROVISION

### Community meeting space

Informed by the need to provide for a medium sized meeting space to accommodate 100-150 persons.

### New Primary School

A new school is proposed in Pegasus which combines the school role of Waikuku Primary and new population of Pegasus. Woodend School cannot expand further due to land constraints and at capacity school roles. As such, two options are seen to exist in terms of Primary School provision in Woodend to accommodate new population:

- (1) the provision of a new Primary School in Woodend; or
- (2) Splitting Woodend School over two campus'.

Within the report, provision of a new Primary School is proposed in accordance with sound planning practice to designate a highly suitable land area at a conceptual stage to serve the future residential population of Woodend. A Primary School requires a threshold of 4000 persons.

The location is indicative only and positioned to best meet the following urban design principles:

- To maximise access to new residential catchments;
- To have good access to main roads;
- Provide open space amenity to surrounding residential areas;
- Offer the potential for further land acquisition for community sports fields.

The future provision of a Primary School requires Ministry of Education and WDC delivery. Ministry of Education is undertaking consultation during similar timeframes as the Woodend Futures project.

## Definitions

**AMENITY** - benefits seen and unseen that add to the quality of life of a community

**CONNECTIVITY** - the ability to create access for multiple means of transport

**CONVENIENCE RETAILING** - 'quick trip' retail activity

**FINE GRAIN** - smaller intensity of commercial land use and building scale e.g. boutique style retail tenancies associated with a main street condition

**HOUSEHOLD CAPACITY** - people per household that is relevant to a specific geographic area

**LEGIBILITY** - an urban form which is able to be easily 'read' and negotiated e.g. a simple connected street network, linking landmarks with defined routes, emphasizing local character aspects

**LIVEABILITY** - refers to the qualities of an area both environmental and social as recognized by all who reside, work, and or visit that area

**MIXED USE TYPOLOGIES** - a combination of housing types within a compact geographic area

**MOVEMENT ECONOMY** - the ability to capture passing trade through a commercial area which in turn contributes to the on-going economic viability in the centre

**WALKABILITY** - measurement that aims to show the walking conditions of an area based upon safety, comfort, and accessibility



WOODEND FUTURES URBAN DESIGN TRANSPORT OPTIONS ASSESSMENT		SH 1 WIDENING	+/M/-
BLUE AND GREEN	Avoiding / ability to limit impact on ecologically sensitive areas	The alignment of the SH corridor does not impact on sensitive areas but additional traffic and increase in impermeable surfaces from a widened road will increase the quantity of stormwater generated entering the natural and reticulated system.	M
MOVEMENT	Ability to retain through movement and north-south connections through Woodend	Through movement in a north-south direction along the main state highway spine is increased as larger volumes of traffic and flow can be accommodated with fewer interruptions. Provides for a continued direct route through Woodend.	M
	Ability to reduce impact on local roading network and east-west connections	Reduced cross / through connectivity in an east-west direction between the SH to the village centre and to residential neighbourhoods. Pedestrian and vehicular connections from local roads reduced, particularly right hand turns as the number of heavy and private vehicle movements increase along with speeds and unimpeded vehicle flows.	-
	Ability to relieve heavy vehicle traffic / traffic intensity from Woodend centre	Increasing intensity of road design and ability to move traffic faster and more efficiently will increase both heavy vehicle traffic and traffic intensity through Woodend centre.	-
	Ability to accommodate future public transport bus routes	Option retains the ability to accommodate future public transport routes (both local and sub-regionally) through Woodend as the alignment continues to link and serve likely destinations including Woodend centre and existing and proposed residential catchments to the east and west.	M
	Proximity of bypass to existing / future residential and employment areas	Although not a bypass option, the SH upgrade is located to the west of the majority of proposed new residential catchments thereby favouring existing developed areas of Woodend in terms of proximity to a minor degree. The option is aligned on the commercial village centre area.	M
	Ability to achieve safe and convenient access from SH to/from Woodend	Higher speeds and greater traffic volumes associated with a wider road carriageway are likely to result in difficulties achieving safe access to Woodend land uses e.g. village centre and residential areas adjacent to the SH. Lateral pedestrian accessibility will also be reduced	-
	Support for walking and cycling access within Woodend and between Woodend and Gladstone Park	Pedestrian accessibility across the SH is reduced with larger traffic volumes and speeds discouraging walking and cycling because of vehicle noise, emissions and traffic hazards. Option retains walking and cycling access between Woodend centre, and Gladstone Park is maintained.	M
SOCIAL AND COMMUNITY	Ability to retain strong linkages to Gladstone Park, Woodend Beach and Pegasus	Option does not require the construction of grade separated intersections at Gladstone Road, Linkages between Woodend, Gladstone Park, Pegasus and Woodend Beach are maintained within the existing local street network.	M
	Ability to avoid severance of existing and future communities	Potential to further sever east and western Woodend communities from each other because of less east-west connections. This disaggregation manifests in less social interaction and a poorer sense of community and social capital.	-
	Ability to avoid sensitive built or natural cultural environments	Sensitive natural and cultural environments are indirectly affected as higher traffic volumes and road designations increases impervious surfaces and runoff containing heavy metals and other contaminants entering waterways.	M
COMMERCIAL CENTRES	Allowing Woodend to strengthen its commercial centre and not compete with other local centres	Movement passing directly through Woodend centre continues along the SH alignment. Degradation in access and amenity within the centre may dissipate some patronage and business to other centres e.g. Pegasus town.	M
	Ability to support and not conflict with the main street economy of Woodend	The main street of Woodend is further bisected by SH 1 thereby reducing accessibility. Limiting access to local businesses from the SH (through closure of pre-existing roads) would decrease the viability of Woodend centre. By reducing business exposure and access in an effort to reduce side frictions from local roads to the SH, opportunities for the village centre to benefit from harness the movement economy of pedestrians and motorists (the ability to capture passing trade, both planned and unplanned stops) would reduce.	M
	Ability to create or enhance a Woodend centre	Access restrictions and amenity reductions may negatively impact on the commercial viability of the Woodend village centre. More provision for through traffic capacity is likely to result in a degraded pedestrian environment and reduced pedestrian amenity in terms of poorer air quality from vehicle emissions as well as noise and vibrations. Adverse visual impacts may result from buildings turning their backs to the SH along the length of the village centre creating inactive, austere edges. Overall this is expected to diminish activity in Woodend centre with energy previously generated by business and retail activities and patronage dissipated elsewhere, decreasing the long term viability of Woodend centre.	M
GROWTH	Form of growth boundary i.e. natural or physical	SH expansion does not affect growth boundary of Woodend.	-



WOODEND FUTURES URBAN DESIGN TRANSPORT OPTIONS ASSESSMENT		SH 1 WIDENING + HEAVY VEHICLE BYPASS	+/M/-
BLUE AND GREEN	Avoiding / ability to limit impact on ecologically sensitive areas	Refer to SH widening. The heavy vehicle bypass is located adjacent to the Taranaki stream margins identified as an ecologically sensitive area to the north of Woodend.	-
	Ability to retain through movement and north-south connections through Woodend	Refer to SH widening.	M
MOVEMENT	Ability to reduce impact on local roading network and east-west connections	Refer to SH widening. Adverse traffic related impacts will be redirected to Rangiora - Woodend Rd and local roads extending to the east from this route.	M
	Ability to relieve heavy vehicle traffic / traffic intensity from Woodend centre	Refer to SH widening. Heavy vehicle traffic and to a limited degree, traffic intensity will be able to be relieved from the Woodend centre via the bypass. While this will go some way to improving amenity and accessibility in the centre (e.g. less vehicle noise, emissions and traffic dangers associated with larger vehicles e.g. trucks and buses) and offer an improved road environment to heavy vehicle drivers in terms of fewer interruptions e.g. need to brake through the centre and secondly road user conflicts e.g. less movement modes using in the same space it is expected that these impacts will simply be redirected to the bypass alignment and its environs. A heavy vehicle bypass and its associated benefits may also encourage a greater number of heavy vehicle movements.	M
	Ability to accommodate future public transport bus routes	Refer to SH widening.	M
	Proximity of bypass to existing / future residential and employment areas	The bypass alignment will affect the existing residential and rural areas to the west of SH 1, particularly along both sides of Rangiora-Woodend Rd and new development areas to the north of Chinnerys Rd, particularly the Ravenswood area. Existing land use and road conditions limit the ability for adverse physical and visual impacts associated with heavy vehicle traffic (accessibility / amenity) to be mitigated to adjacent land uses particularly to residential zoned properties fronting Rangiora - Woodend Rd.	M
	Ability to achieve safe and convenient access from SH to/from Woodend	Refer to SH widening. Redirecting heavy vehicle traffic could both improve and reduce the ability to achieve safe and convenient access from the SH. On the upside, the bypass will help to decrease road user conflicts by removing one user from the SH but conversely by providing for additional road capacity and movement efficiencies on the SH the ability to access areas of Woodend from the SH may decrease.	M
	Support for walking and cycling access within Woodend and between Woodend and Gladstone Park	Refer to SH widening.	M
SOCIAL AND COMMUNITY	Ability to retain strong linkages to Gladstone Park, Woodend Beach and Pegasus	Refer to SH widening.	M
	Ability to avoid severance of existing and future communities	Refer to SH widening. Depending on the alignment, the bypass has the potential to sever new residential communities to the north of Chinnerys Rd through the Ravenswood area from existing residential areas.	M
	Ability to avoid sensitive built or natural cultural environments	Refer to SH widening. The bypass alignment also is likely to be located in proximity to Taranaki stream as a sensitive natural environment in addition to being on the eastern edge of Maori Reserve 873 properties fronting onto Rangiora- Woodend Rd.	M
COMMERCIAL CENTRES	Allowing Woodend to strengthen its commercial centre and not compete with other local centres	Refer to SH widening.	M
	Ability to support and not conflict with the main street economy of Woodend	Refer to SH widening. In addition, the main street economy may be further reduced by redirecting heavy vehicles and therefore their ability to stop and purchase away from the centre.	M
	Ability to create or enhance a Woodend centre	Refer to SH widening. By reducing heavy vehicle movements, overall pedestrian experience, amenity and safety is improved in the centre compared to simply widening the SH..	M
GROWTH	Form of growth boundary i.e. natural or physical	The bypass forms a physical non-natural growth boundary to the west of Woodend.	M



WOODEND FUTURES URBAN DESIGN TRANSPORT OPTIONS ASSESSMENT		SHORT EASTERN BYPASS	+/M/-
BLUE AND GREEN	Avoiding / ability to limit impact on ecologically sensitive areas	The bypass alignment creates issues with overland flow paths and is located to the immediate west of high risk flooding areas.	-
MOVEMENT	Ability to retain through movement and north-south connections through Woodend	North-south movement is continued through Woodend along a shorter and more direct route with fewer speed interruptions and greater movement efficiencies.	+
	Ability to reduce impact on local roading network and east-west connections	All traffic moving to the east of Woodend would be required to cross the major roadway. East-west connections could be maintained through grade separated intersections where they cross the bypass alignment but conversely, these east-west connections may not be directly accessible from the bypass by way of on/off ramp. This adversely impacts on the maintenance of east-west connections to the centre. The bypass allows for non-Woodend destination traffic i.e. those travelling to Pegasus or Ravenswood to be diverted from the SH. This is expected to provide more trouble-free access from the SH to local road networks (particularly right hand turns) and vice versa as traffic volumes and congestion at intersections are reduced.	M
	Ability to relieve heavy vehicle traffic / traffic intensity from Woodend centre	Traffic intensity and heavy vehicle traffic is reduced through Woodend centre by the eastern bypass. This shift east is expected to improve amenity and accessibility in the centre (e.g. less vehicular traffic and noise, emissions and traffic dangers) and offer improved movement efficiencies to bypass users through the maintenance of mobility with fewer interruptions and conflicts between movement modes e.g. vehicular use only.	+
	Ability to accommodate future public transport bus routes	Depending on the design of the bypass and access points, public transport is most likely to be limited to sub-regional routes from and to Christchurch from Pegasus town only. Unless access is provided at Eders/Gladstone Road to the bypass there is little ability to integrate with future local Woodend PT routes.	-
	Proximity of bypass to existing / future residential and employment areas	The bypass is located in close proximity to future residential areas to the east and creates a hard edge that stops growth from migrating eastward.	-
	Ability to achieve safe and convenient access from SH to/from Woodend	The bypass allows for non-Woodend destination traffic to be diverted from the current SH. This is expected to provide more trouble-free access for all movement modes from the SH to/from Woodend as traffic volumes, speeds as well as congestion at intersections are reduced. Pedestrian safety and access can be further improved as the SH takes on less 'through' route importance. This could involve the re-design of the existing SH condition to lower vehicle speeds and increase driver awareness e.g. installation of more pedestrian crossings/refuge medians, narrowing of carriageways and other traffic calming devices.	M
	Support for walking and cycling access within Woodend and between Woodend and Gladstone Park	Walking and cycle access can be maintained where the bypass seeks to cross local roads between Woodend and Gladstone Park through the provision of grade separated intersections (either by over or underpassing) to allow for the safe separation but continuation of traffic flows of both transport axes. This however could inhibit walking / cycle access and connectivity as access is made more difficult and ramp systems that require extra travel and effort. Noise in particular reduces the desirability of walking/cycling between the two destinations.	M
SOCIAL AND COMMUNITY	Ability to retain strong linkages to Gladstone Park, Woodend Beach and Pegasus	Unless the bypass allows for a mid point connection to Woodend, the ease of linkage and connection to Gladstone Park, Woodend Beach and south Pegasus will be reduced. To access Gladstone Park / Woodend Beach / south Pegasus users will be required to use the SH/local roads from the north/south bypass entry/exit points. The bypass effectively weakens these linkages.	M
	Ability to avoid severance of existing and future communities	The bypass is expected to create both a physical and non-physical social and economic separation between the growing towns of Woodend (both existing and future residential populations) and Pegasus. Pegasus and north Woodend (Ravenswood) traffic would be separated from Woodend traffic by the bypass.	-
	Ability to avoid sensitive built or natural cultural environments	Current indicative bypass alignment is located adjacent to a higher risk flooding area, and along overland flow path.	-
COMMERCIAL CENTRES	Allowing Woodend to strengthen its commercial centre and not compete with other local centres	Reduces the viability of the existing commercial centre as non-Woodend traffic would be diverted away from the village centre. This would encourage the growth of Pegasus town centre as some of the energy previously captured and retained in Woodend centre is dispersed elsewhere.	-
	Ability to support and not conflict with the main street economy of Woodend	The retail and commercial activities have reduced potential to benefit economically as less traffic is brought through the village centre. Businesses are therefore less able to capture trade from passing traffic. On the upside, the bypass creates a more favourable pedestrian condition through improved safety and amenity which in turn stimulates pedestrian and local vehicular activity in Woodend centre.	-
	Ability to create or enhance a Woodend centre	As above.	-
GROWTH	Form of growth boundary i.e. natural or physical	The bypass forms a physical non-natural growth boundary to the east of Woodend between Woodend and Pegasus that would potentially severe future growth to the east of the bypass.	-



WOODEND FUTURES URBAN DESIGN TRANSPORT OPTIONS ASSESSMENT		LONG EASTERN BYPASS	+/M/-
BLUE AND GREEN	Avoiding / ability to limit impact on ecologically sensitive areas	Bypass avoids ecologically sensitive areas to the north but is located within high risk flooding areas to the east	-
MOVEMENT	Ability to retain through movement and north-south connections through Woodend	North - south movement is maintained along a more direct route with fewer speed interruptions and greater movement efficiencies used by all non-Woodend destination traffic. North-south connection through Woodend is maintained by the SH but many through movements are removed and redirected to the bypass.	+
	Ability to reduce impact on local roading network and east-west connections	All major through traffic for non-Woodend destinations i.e. Pegasus or Ravenswood to be re-routed to the east of Woodend to the bypass therefore reducing the impact of heavy traffic and traffic volumes upon the local road network as traffic volumes and congestion at intersections is reduced. East-west connections are mostly likely maintained through grade separated intersections where they cross the bypass alignment but conversely these east-west connections (particularly Gladstone Rd) may not be directly accessible from the bypass thereby adversely impacting on the ability to maintain connections to the centre.	M
	Ability to relieve heavy vehicle traffic / traffic intensity from Woodend centre	Traffic intensity and heavy vehicle traffic is reduced through Woodend centre by the bypass as heavy vehicles and non-Woodend traffic e.g. to / from Pegasus would be routed around Woodend. This shift east is expected to improve amenity and accessibility in the centre (e.g. less vehicular traffic, noise, emissions and traffic dangers) and offer improved movement efficiencies to bypass users through the maintenance of mobility with fewer interruptions and conflicts between movement modes.	+
	Ability to accommodate future public transport bus routes	Depending on the design of the bypass and access points, public transport is most likely to be limited to sub-regional routes from and to Christchurch from Pegasus town only. Unless access is provided at Eders/Gladstone Road to the local road network to the bypass there is little ability to integrate with future local Woodend PT routes.	-
	Proximity of bypass to existing / future residential and employment areas	All future residential and commercial areas in Woodend would not be serviced by the bypass. In order to reach these areas, patrons would have to use the local roading network and to access the bypass to the north and south of Woodend. The bypass is located further west of Woodend future residential areas and located through a portion of the Pegasus/Mapleham development.	-
	Ability to achieve safe and convenient access from SH to/from Woodend	The only access points to/from the bypass would be to the north and south of Woodend unless an interchange was provided for Gladstone Road. By allowing for non-Woodend destination traffic to be diverted from the SH, it is expected this will enable more trouble-free access for all movement modes from the SH to/from Woodend as traffic volumes, speeds as well as congestion at intersections are reduced. Pedestrian safety and access can be further improved as the SH takes on less 'through' route importance. This could involve the re-design of the existing SH condition to lower vehicle speeds and increase driver awareness e.g. installation of more pedestrian crossings/refuge medians, narrowing of carriageways and other traffic calming devices.	M
	Support for walking and cycling access within Woodend and between Woodend and Gladstone Park	Walking and cycle access can be maintained where the bypass seeks to cross local roads between Woodend and Gladstone Park through the provision of grade separated intersection (either by over or underpassing) of Gladstone Road to allow for the safe separation but continuation of traffic flows of both transport axes. A pedestrian overpass could be utilised north or south of Gladstone Road if a grade separated vehicle interchange was not put in place. Both solutions however could inhibit walking / cycle access and connectivity as access is made more difficult and ramp systems that require extra travel and effort. Noise in particular reduces the desirability of walking/cycling between the two destinations.	M
SOCIAL AND COMMUNITY	Ability to retain strong linkages to Gladstone Park, Woodend Beach and Pegasus	Unless the bypass allows for a mid point connection to Woodend, the ease of linkage and connection to Gladstone Park, Woodend Beach and south Pegasus will be reduced. To access Gladstone Park / Woodend Beach / south Pegasus to the east of Woodend users will be required to use the SH/local roads from the north/south bypass entry/exit points. The bypass effectively weakens these linkages.	M
	Ability to avoid severance of existing and future communities	The location of the bypass separates Woodend from any future development to the east of the bypass (Pegasus), but does allow for development to the west of Woodend and east of the actual bypass. The bypass severs the future community at Mapleham / Pegasus town.	-
	Ability to avoid sensitive built or natural cultural environments	The bypass alignment is located within the Western Ridge Conservation Management Area, an area of high cultural and historic value and encroaches upon the natural habitats that separate Woodend from Pegasus and higher risk flooding areas.	-
COMMERCIAL CENTRES	Allowing Woodend to strengthen its commercial centre and not compete with other local centres	Reduces the viability of the existing commercial centre as non-Woodend traffic would be diverted away from the village centre. This would encourage the growth of Pegasus town centre and other northern village centres as some of the energy previously captured and retained in Woodend centre is dispersed elsewhere. The bypass alignment may also restrict use of the small centre / facilities proposed within the Mapleham development.	-
	Ability to support and not conflict with the main street economy of Woodend	The main street would be considered as an alternate route to the bypass and would consequently leak possible business to other areas outside Woodend thereby reducing the ability of the centre to capture the movement economy and for main street viability to be maintained.	-
	Ability to create or enhance a Woodend centre	The retail and commercial activities have reduced potential to benefit economically as less traffic is brought through the village centre. Businesses are therefore less able to capture trade from passing traffic. On the upside, the bypass creates a more favourable pedestrian condition in the main street through improved safety and amenity which in turn stimulates pedestrian and local vehicular activity in Woodend centre.	-
GROWTH	Form of growth boundary i.e. natural or physical	The bypass provides a permanent separation buffer between Woodend and Pegasus which creates a permanent physical growth boundary to the east of Woodend.	-