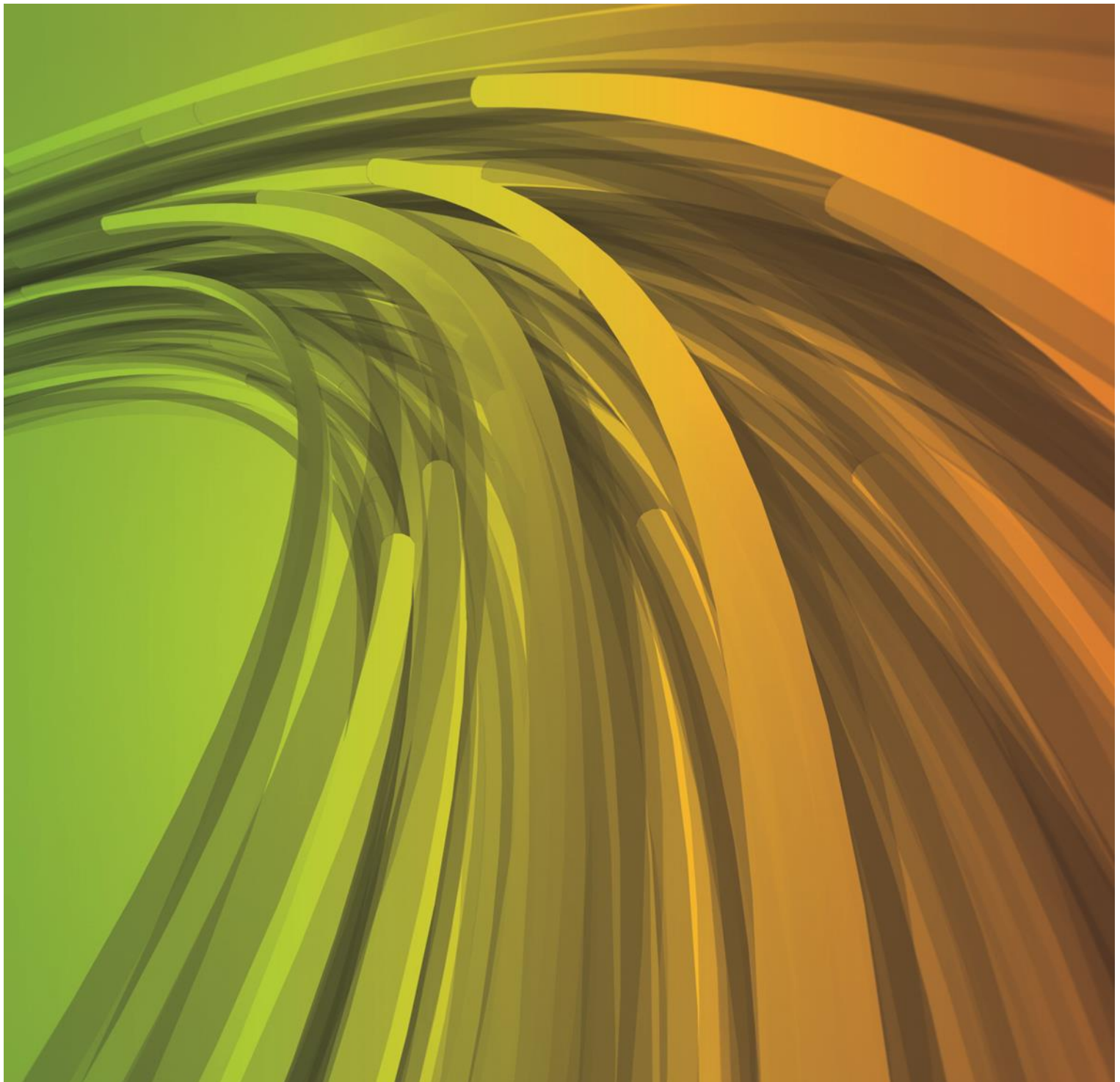


# Tuakau Structure Plan

Integrated Transportation Assessment



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## Integrated Transportation Assessment

Client: Waikato District Council

Co No.: N/A

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|          |               |         | Name/Position                           | Signature  |
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## Executive Summary

The population of Tuakau has been growing relatively quickly in recent years and was recorded as being 4,200 in the 2013 census. The Tuakau Structure Plan is planning for a 30 year horizon by which time a population of around 6,500 appears to be a reasonable expectation.

There are some existing issues with respect to connectivity within the town and it is important that future development does not aggravate these but rather takes place in a manner that helps to improve connectivity, ensures new development is served efficiently, and provides opportunities for active transport modes where possible.

Tuakau has a strong connection with Pukekohe which places importance on internal linkages with Buckland Road and improving the standard of Buckland Road for all vehicles including bicycles, with the option of a cyclist/pedestrian path following the North Island main Trunk railway line also warranting investigation.

Similarly, the development of the Whangarata Business Park and the growth of Pokeno will increase the need to upgrade Whangarata Road to cater for increasing amounts of heavy commercial vehicle and commuter traffic.

Within Tuakau the following recommendations are made with respect to the transport network:-

- 1) The extent of development along Dominion Road should be limited as it is difficult and is unlikely to be economical to upgrade and extend Dominion Road to Ridge Road, or to link it to Barnaby Road to provide some network connectivity. Without such connectivity it would become an inefficiently serviced cul-de-sac placing increasing pressure on the Dominion Road/Harrisville Road intersection.
- 2) Large lot/rural residential subdivision could be suitably accommodated in the triangle between Barnaby Road and Harrisville Road with a road linking the two.
- 3) A connection from Gibson Road to Buckland Road should be planned with links off this to Lili Road and Jellicoe Road and a pedestrian/cycle link to Elizabeth Street.
- 4) A crossroads intersection with Gibson Road on George Street would be a suitable location for an east-west link to connect with the Whangarata Business Park. There are options to join either/or Tuakau Saleyards Road and Carr Street to this east-west link to improve localised north-south connectivity.
- 5) Staging of development on the western side would appear to be better focussed north of Buckland Road initially because of proximity to the schools and town centre and the benefits of establishing links between the town centre and Buckland Road. Development on the south side of Buckland Road should be staged to progress eastwards from Geraghtys Road but infilling between Geraghtys Road and George Street should be substantially completed before developing west of Geraghtys Road.
- 6) Development south of Alexandra Redoubt Road is not favoured in transport planning terms. Whilst this area could easily be serviced in roading terms from existing roads and paper roads, it would be a poor land use/transport planning outcome as the area is distant from the town centre and most facilities.

## 1.0 Glossary of Terms

The following abbreviations and terms are used in this report

|               |                                     |
|---------------|-------------------------------------|
| ADT           | Average Daily Traffic               |
| District Plan | The Operative Waikato District Plan |
| HCV           | Heavy Commercial Vehicle            |
| NIMTR         | North Island Main Trunk Railway     |
| NZTA          | The NZ Transport Agency             |
| SH            | State Highway                       |
| vpd           | Vehicles per day                    |
| WDC           | Waikato District Council            |
|               |                                     |
|               |                                     |
|               |                                     |

## 2.0 Introduction

Waikato District Council is preparing a Structure Plan for Tuakau. The Structure Plan is intended to be incorporated into the District Plan with the purpose of guiding development for the next 30 years or so, and will include land uses, infrastructure requirements, community facilities, environmental objectives and urban design.

This report examines the requirements, opportunities and options for all modes of transportation to address current challenges and to support the future development of Tuakau.

The study area focusses on the township and its relationship with the immediately surrounding countryside. In terms of transportation the links Tuakau has with Pukekohe, Pokeno and SH1 are particularly relevant. Cycling and walking facilities and traffic management are important in and immediately around the town's existing and anticipated urban area.

## 3.0 Land Use Planning Context

Tuakau has a population of approximately 4,200 according to the 2013 census. The Franklin Growth Strategy which was adopted in 2007 reported a population of 3200 in 2004, rising to 4,300 by 2021 and 5,900 by 2051. It would therefore appear that growth since 2004 has been faster than was envisaged. A growth model prepared by Property Economics for this structure planning exercise<sup>1</sup> forecasts a 53% growth in population by 2041. The 30 year timespan of this Structure Plan would thus envisage a population of around 6,500 with approximately 2,600 households.

Within the town there is a significant amount of residentially zoned land which has yet to be developed. Waikato District Council staff have estimated that this could accommodate over 1,100 households, sufficient to provide for in excess of the projected 6,500 population. However, the land available may not provide the community's desired range of section types, and in order not to preclude some longer term development options, the Structure Plan needs to consider infrastructure beyond the current residentially zoned areas.

Following initial stages of public consultation, Waikato District Council has proposed potential extended areas of rural residential/large lot growth to the north-east of the town (Dominion Road and Barnaby Road environs) and south of the town off River Road, as well as extended residential areas around the balance of the existing built up residential area.

On the eastern side of Tuakau, there is a substantial area of land which has already been zoned for industrial or industrial service activities. This has been titled the Whangarata Business Park. It is anticipated to provide sufficient land for industrial and associated service industries for at least the lifetime of the Structure Plan. A structure plan was developed for the Whangarata Business Park and has been incorporated in the District Plan.

Pukekohe is a major generator of trips to and from Tuakau, providing employment, retail and servicing activities. The population of Pukekohe in the 2013 census was reported as being about 19,000.

Agricultural land use with a considerable market gardening element surrounds Tuakau. Further afield to the west, both north and south of the Waikato River, there are significant areas of forestry plantings which are likely to be harvested in the next decade; some of which may find its way to or through Tuakau.

## 4.0 Existing Traffic Environment

### 4.1 Traffic Volumes

Figure 1 illustrates the traffic counts on the principal routes in and out of Tuakau. The importance of the relationship with Pukekohe is evident with Bucklands Road carrying 8,000 vpd, being almost double the next busiest road which is River Road to the south of Tuakau.

River Road provides the linkage to the Tuakau Bridge and areas south of the Waikato River, including all the communities out to Port Waikato.

To the east, Whangarata Road in combination with Pokeno Road provides the linkage to SH1 (north and south) via the Pokeno interchange and thence SH2 via the SH1/SH2 interchange. This road linkage was a key factor in

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<sup>1</sup> Tuakau, Waikato – Structure Plan Centre Assessment, Property Economics, April 2014

the zoning of the Whangarata Business Park. Ridge Road which runs north-east from the end of Whangarata Road provides an alternative connection to SH1 to the north but is a more tortuous and lower standard route than Pokeno Road.

Harrisville Road is another route for traffic between Tuakau and SH1 to the north, also carrying reasonable traffic volumes and is an efficient option for northern Tuakau.

Dominion Road is a long cul-de-sac with a moderate traffic volume at its western end. The traffic volume drops rapidly further east outside the current urban area where it serves lifestyle blocks and agricultural land use.

Bollard Road is an internal collector road within the town providing the main link between the town centre and the eastern industrial areas including the Tuakau Saleyards.

George Street is the spine of the road network running through the town centre and carries 5,000-6,000 vpd.

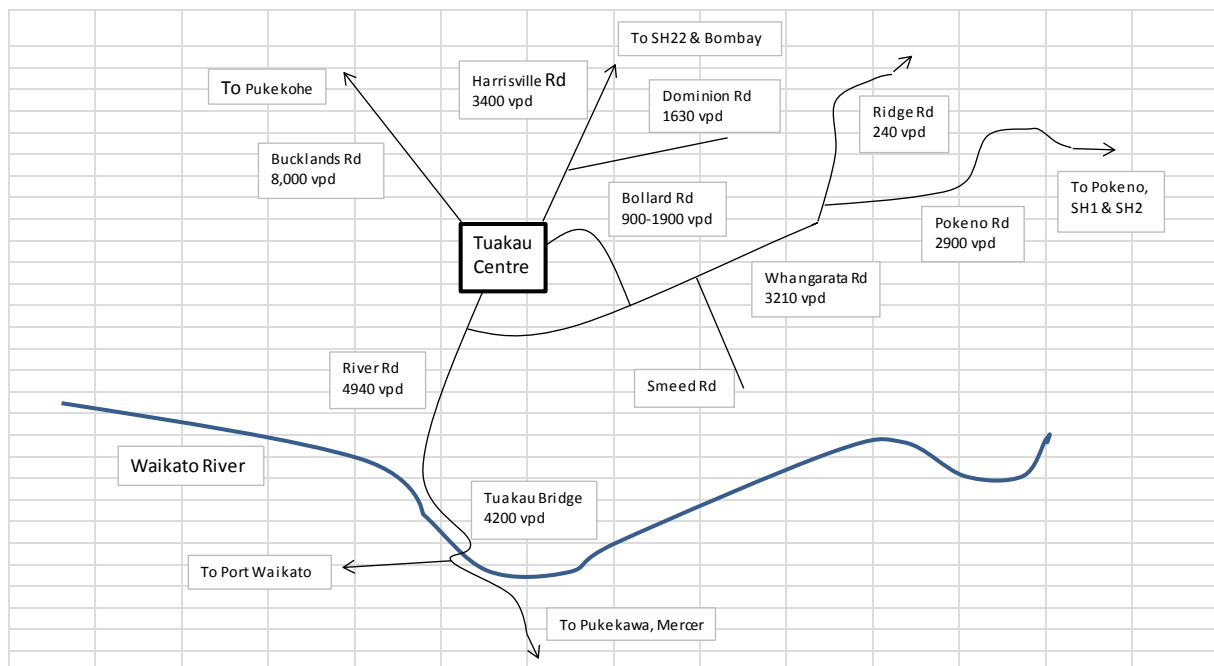


Figure 1 Existing Traffic Counts

## 4.2 Travel Modes

The analysis of the 2013 census for main mode of travel to work and destination has yet to be published. The 2006 census recorded the following data:-

Table 1 Travel to work mode as at 2006 census

| Origin | Destination       | Mode    |                  |                 |
|--------|-------------------|---------|------------------|-----------------|
|        |                   | Vehicle | Public Transport | Walking/cycling |
| Tuakau | Franklin District | 92.5%   | 0.0%             | 7.5%            |
|        | Auckland          | 96.9%   | 3.1%             | 0%              |

Table 2 Journey to work destination as at 2006 census

| Origin | Destination (former local authority areas) |             |           |               |         |          |
|--------|--|-------------|-----------|---------------|---------|----------|
|        | Franklin                                   | North Shore | Waitakere | Auckland City | Manukau | Papakura |
| Tuakau | 64%  | 1%          | 1%        | 13%           | 15%     | 8%       |



### 4.3 Road Safety

Plots of crashes in the Tuakau township and in the surrounding area are shown on the following pages.

A crash listing is also included as Appendix A.

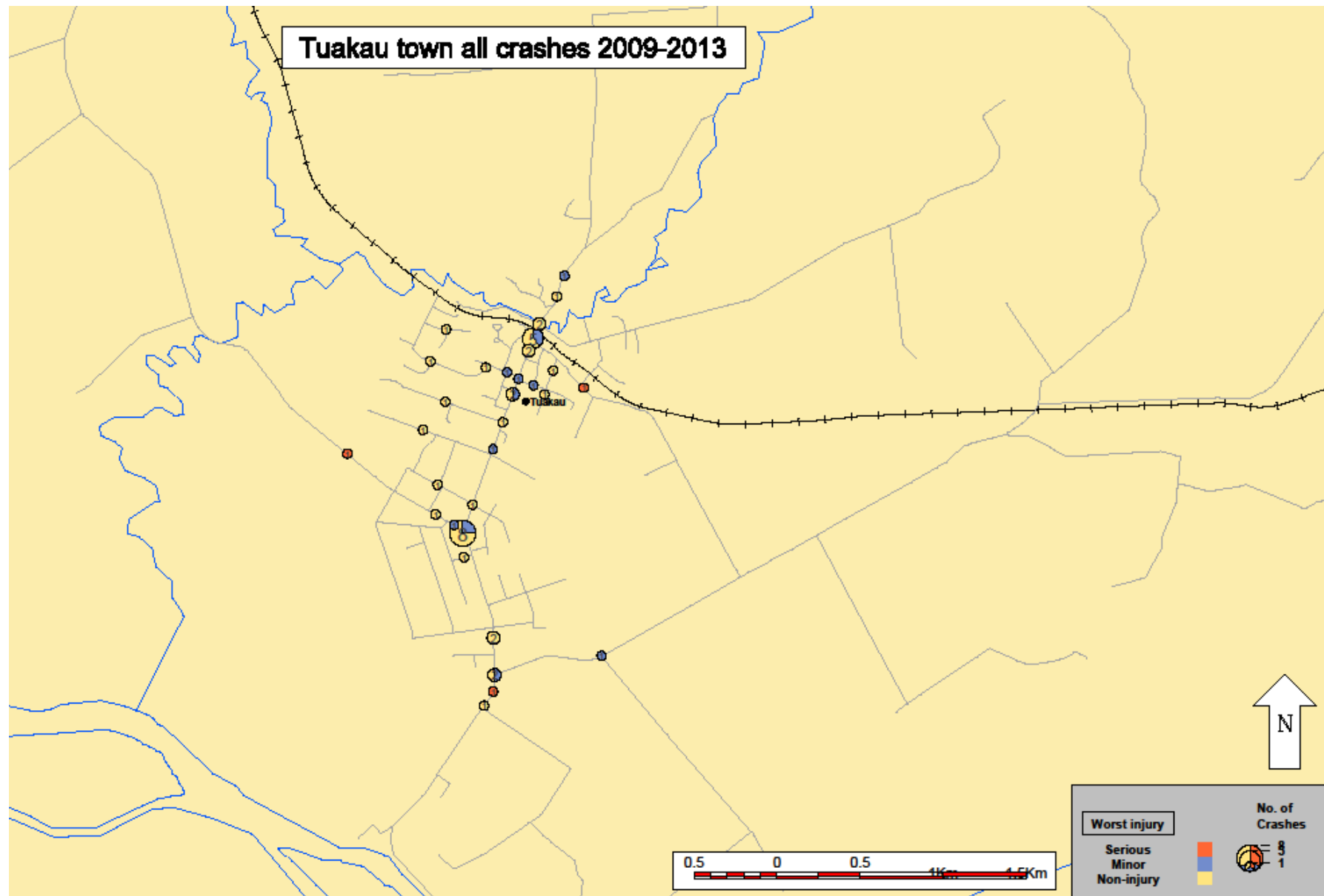
Within the township there is cluster of crashes spread around the northern end of George Street between Liverpool Street and Madill Street which is the main retail/commercial area. This is not unexpected given the amount of activity in the area with turning movements, parking, and distractions for drivers. These crashes all either resulted in minor injury or no injuries, and do not indicate any specific safety issues.

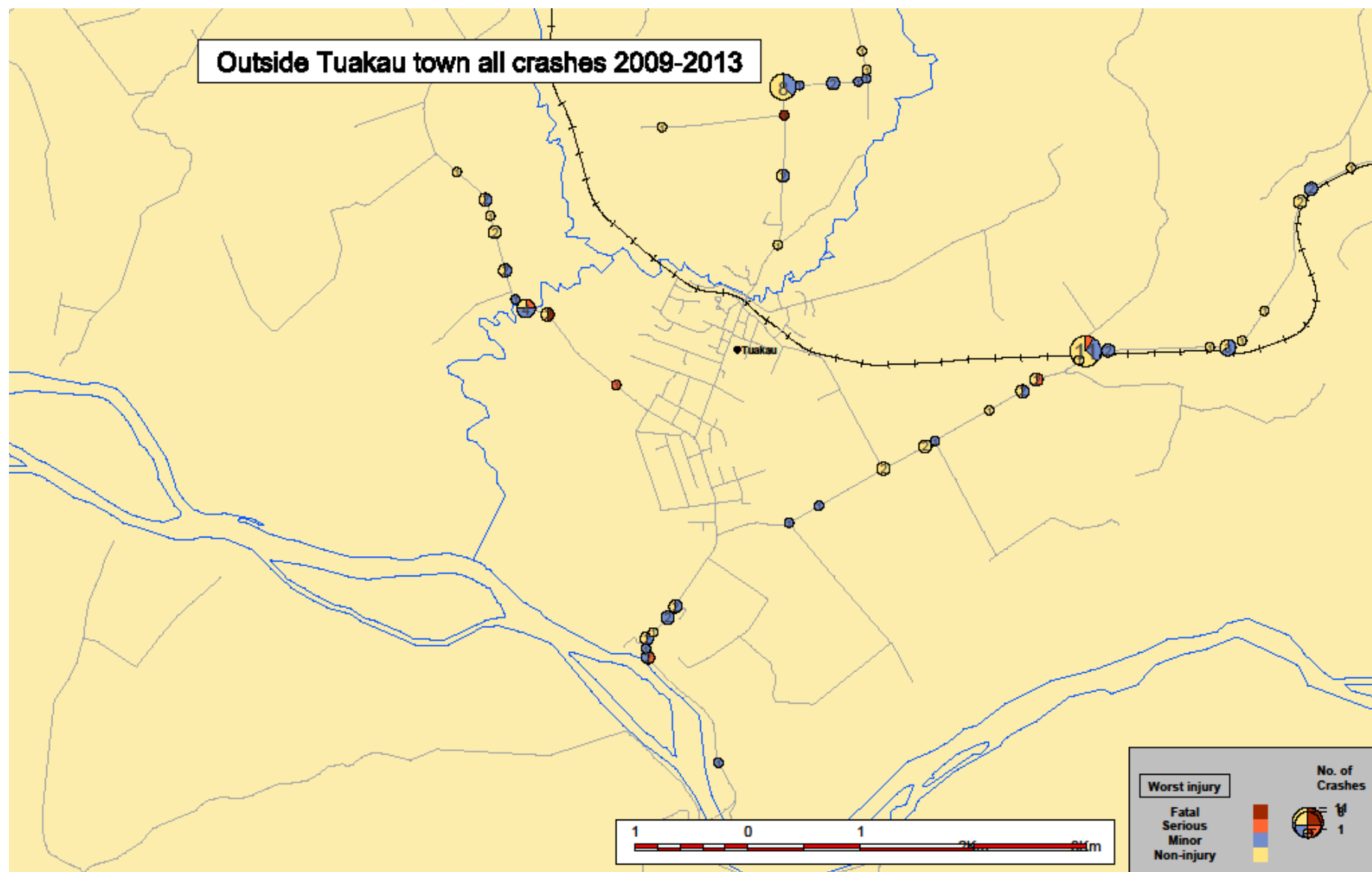
The George Street/Buckland Road intersection has also recorded a cluster of six crashes. This is the busiest intersection in Tuakau. Five of these crashes involved a northbound vehicle turning right into George Street in collision with a southbound through vehicle from Buckland Road. This suggests there may be scope for making the intersection safer.

Outside the township, the crash records are dominated by loss of control type crashes. Clusters of crashes are evident at four locations:-

- Whangarata Road-Pokeno Road where there are reverse curves as the road crosses the railway (NIMTR).
- At Harrisville where there is a right angle bend on Harrisville Road.
- On Buckland Road where there are reverse curves and a slight dip as the road crosses a stream.
- On River Road as the road bends approaching the Waikato river, and there is also an intersection with Lapwood Road.

This pattern of crashes is not unusual for a rural area with moderately high traffic volumes. Nevertheless, there may well be scope for some engineering measures, in combination with other measures, to improve safety, particularly on Whangarata Road. Consequently studies should be undertaken to identify measures that will ensure traffic growth does not result in disproportionate increases in crashes on the principal routes in and out of Tuakau.





## 5.0 Planning and Policy Framework

### 5.1 Waikato Integrated Land Transport Strategy (2012)

The Waikato Integrated Land Transport Strategy (WILTS) was prepared by Opus International Consultants in 2012 but has not progressed beyond a draft stage to be formally adopted. This Strategy was prepared in conjunction with the NZ Transport Agency, Waikato Regional Council and the Future Proof Transport Reference Group amongst other key stakeholders and aligns with the Waikato Regional Land Transport Strategy and the Future Proof sub-regional growth strategy.

One of the purposes of WILTS is to “provide direction on the future form and function of Waikato District Council’s road network”. Seven action areas were identified. An interpretation of how these action areas relate to Tuakau is shown in Table 1.

**Table 3 Draft Waikato Integrated Land Transport Strategy Action Areas**

| Action Area                    | Commentary on draft Integrated Land Transport Strategy actions.  |
|--------------------------------|--|
| Planning for growth            | <p>Industrial, commercial and residential growth opportunities may need further roads developing.</p> <p>Reinstatement of Tuakau rail station if viable demand established.</p> <p>Recreational walking and cycling routes between Tuakau, Port Waikato and Pukekohe.</p> <p>Redevelopment and upgrading of the town centre.</p>   |
| Improving road safety          | Continue to implement and review the Waikato District Road Safety Action Plan in line with the national Safer Journeys road safety strategy and the five priorities of Safe speeds, Safe roads and roadsides, Safe vehicles, Safe road use and Coordination.   |
| Managing the transport network | <p>Six actions were identified:</p> <ul style="list-style-type: none"> <li>• Maintain, operate and preserve the existing network (as a first priority covering 90% of spending).</li> <li>• Improvements to provide additional capacity and address safety issues (remaining 10% of spending).</li> <li>• Review and update the form and function of the strategic and local road network in line with growth and tourism.</li> <li>• During road rehabilitation activities consider opportunities to reconstruct the road to appropriate design widths (road hierarchy) and provision for walking, cycling and passenger transport.</li> <li>• Manage route security and protect key strategic transport corridors.</li> <li>• When implementing new transport projects ensure early consideration to avoid, remedy or mitigate adverse environmental effects.</li> </ul> |
| Supporting freight transport   | The local road network should be maintained and improved in line with the road hierarchy to ensure appropriate levels of service and efficient movement of freight. Identification of HPMV (high productivity motor vehicle) routes may be appropriate.  |
| Supporting rail transport      | <p>Examine the potential for passenger train services between Hamilton and Auckland including extending the current Auckland passenger train service.</p> <p>Ensure residential and freight intensive activities are located where there is good access to the rail network and safeguard land for rail connections with major producers/consumers.</p>  |

|                                 |   |
|---------------------------------|---|
| Promoting bus transport         | Provide infrastructure for bus services and review on an ongoing basis the efficiency of existing services and the feasibility of new services.<br><br>Monitor opportunities for park and ride at key locations.              |
| Encouraging walking and cycling | A range of actions were identified for identifying and implementing walking and cycling facilities and otherwise encouraging these modes. This included making explicit provision in structure plans for walking and cycling. |

## 5.2 District Plan

At the time of this report, Tuakau is subject to the Franklin Section of the Waikato District Plan. There are some minor inconsistencies between the Franklin Section and the rest of the District Plan in terms of transportation, but these are of a minor nature and not critical to structure planning for Tuakau.

It is envisaged that the Tuakau Structure Plan will be adopted as part of the Waikato District Plan at some stage. Within the Franklin Section of the District Plan there is already a structure plan for the Whangarata Business Park which was introduced as Plan Change 22.

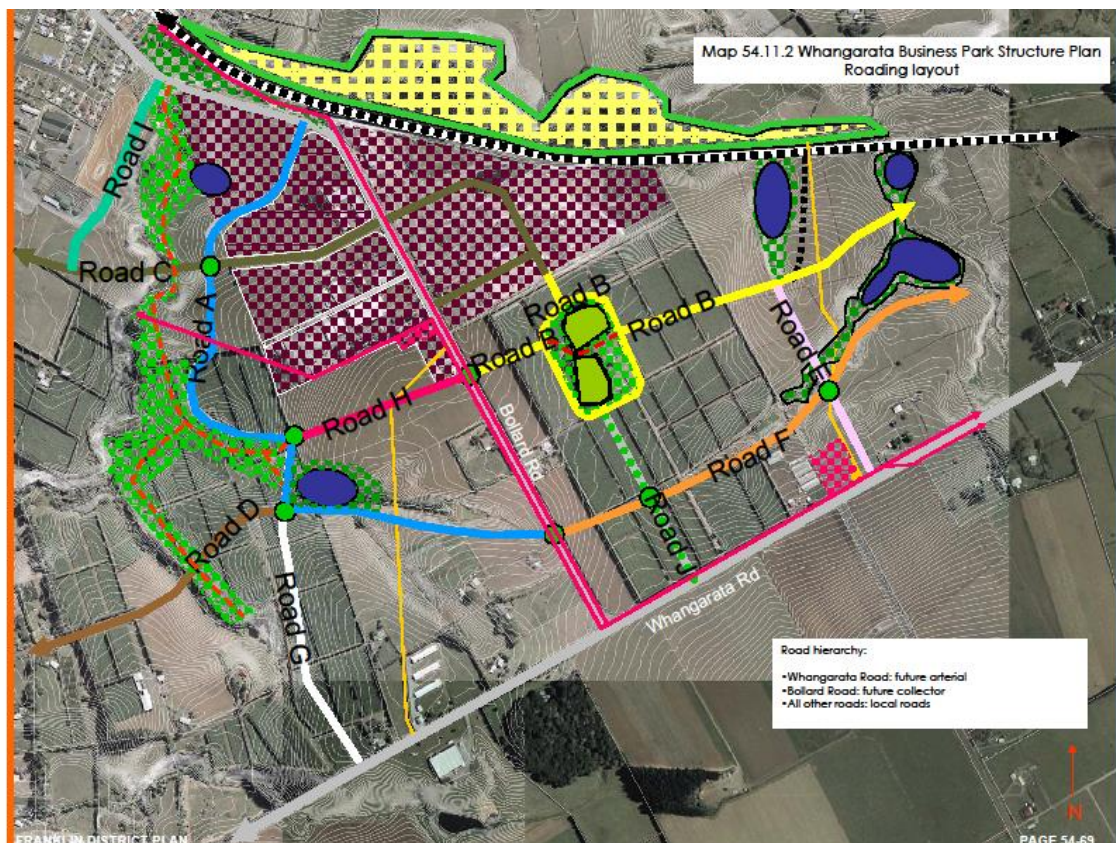


Figure 2 Indicative road network for Whangarata Business Park (Plan Change 22 of Franklin Section of Waikato District Plan)

The proposed Tuakau Structure plan does not aim to re-visit this although it is noted that some of the detailed recommendations for cross-sections of roads do not seem realistic or appropriate. The Whangarata Business Park embraces some 65ha of developable Industrial zoned land and 12ha of Industrial Services zoned land.

Outcomes of this ITA which could be taken into the District Plan should include:-

- Indicative future road networks.
- Guidance on road cross-sections for new roads in subdivisions.
- Identification of intersection upgrades which may be conditions for future development to occur.

### 5.3 Urban Design

Waikato District Council recognises the Ministry for Environment's Urban Design Protocol (UDP) some of the principles of which are embodied in the Waikato Integrated Land Transport Strategy. Two of the key strands of the UDP which apply to transportation are:-

- Choice: promoting diversity and choice for people (e.g. enabling choice of transport modes to suit sustainable lifestyles, ensuring infrastructure and land use are designed and planned so as not to prejudice future transportation choices).
- Connections: creating safe and attractive links; placing a high value on walking, cycling and public transport; anticipating demands for all transport modes; facilitating access to services; efficient movement of goods and freight.

A separate Urban Design report has been prepared in parallel with this Integrated Transportation Assessment.

Whilst the philosophies and principles of the UDP may be accepted, the Structure Plan needs to strike a balance between what may be aspirational from an urban design perspective, what is practically and economically achievable, and what the residents and businesses preferences may be.

## 6.0 Land Use Assumptions

This ITA is based on the following assumptions about land use.

### 6.1 Industrial and Industrial Service business land

The Whangarata Business Park is anticipated to provide sufficient industrial and industrial service land for businesses for the life of this structure plan.

### 6.2 Retail and Commercial land

The growth assessment by Property Economics Ltd for this structure planning exercise has concluded that there is sufficient land available already zoned for the foreseeable demand for retail and commercial activities for the life of the structure plan. Whilst there will be some growth in retail and commercial activity as the population grows, this activity will be accommodated within the existing retail and commercial area around the northern end of George Street, and will enhance the viability of that business district.

Otherwise there may just be minor local shops such as dairies or takeaways to support their immediate neighbourhoods.

### 6.3 Community Facilities

No new significant community facilities are planned.

### 6.4 Residential

The Property Economics growth assessment has forecast a population of 8,600 by 2041 comprising 3,400 households for the Tuakau retail catchment area. On a pro-rata basis this translates to a population of around 6,500 and 2,600 households in the Tuakau township.

Figure 3 is the draft Tuakau Structure Plan – Concept Plan which has identified possible future residential areas beyond what is currently zoned. These areas comprise a combination of densities of residential development to the south, west and north of the existing residential development, with country living zones extending out along Dominion Road, and between Harrisville Road and Barnaby Road. This Concept Plan is indicative only and has been generated for discussion purposes following public consultation.



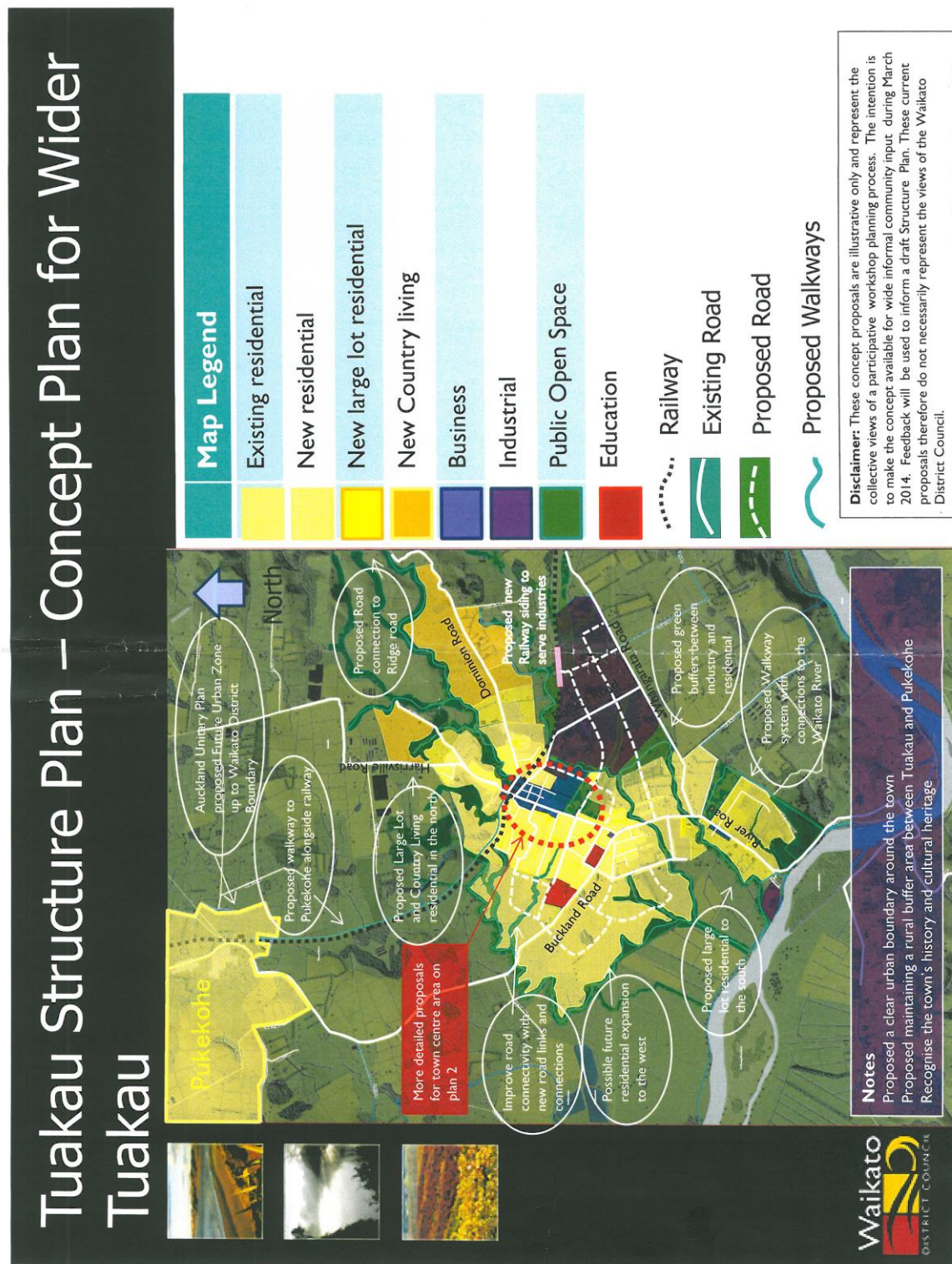


Figure 3 Draft Concept Plan

## 7.0 Challenges

The following challenges and issues are evident, some of which have been identified in the public consultation to date:-

|  |  |
|--|--|
| Traffic Growth                             | In approximate terms, the 53% growth in population which is predicted for the structure planning period will result in a similar growth in traffic generation. If residential growth is spread around the town, and the industrial and commercial growth is confined to the already zoned areas as expected, then traffic volumes on the arterial and collector roads can be expected to more or less mirror the growth in population. |
| Dominion Road no exit                      | Some of the community has expressed a wish to see Dominion Road extended to connect with Ridge Road to provide an alternative route to and from SH1.   |
| West side connectivity                     | On the west side of George Street there is very limited connectivity with Buckland Road. Jellicoe Avenue and Gibson Road are no exit streets and Elizabeth Street only connects indirectly with Buckland Road via Church Street.   |
| Connectivity with Whangarata Business Park | The Whangarata Business park area can be expected to provide employment for increasing numbers of Tuakau residents but is accessible only via Bollard Road and Whangarata Road so is poorly connected to where the population is currently centred. It is particularly poorly served by pedestrian and cycle facilities but is a suitable distance from residential areas for walking and cycling to work.                             |
| Railway                                    | The railway creates a degree of severance being able to be crossed only at the George Street level crossing or by the one lane bridge at Park Avenue. On the positive side it offers potential for freight transport if a siding were to be constructed at the Whangarata Business Park. The prospect of a passenger rail service has also been raised often in the past.  |
| Pedestrian and cyclist facilities          | There are currently no designated cycle facilities or pedestrian facilities other than footpaths alongside roads. Better facilities could encourage more use of both modes for commuting, everyday social and business trips, and recreation.  |
| Public passenger transport is very limited | Public passenger transport in the form of buses is currently very limited. The viability of providing a higher level of service should improve as the population of Tuakau grows and will also be influenced by external factors such as the attractiveness of rail services between Pukekohe and Auckland which buses can link with.  |
| Spatial distribution of development        | The commercial and retail hub of Tuakau is located eccentrically, close to the northern end of the town so is not central to the population. Ribbon style development has extended southwards towards the river including some industry and employment creating a disjointed semi-urban corridor.  |

## 8.0 Network Improvements and Connectivity

### 8.1 West Side Connectivity

Gibson Road is best placed to be extended westwards to loop round to join Buckland Road and has been constructed to facilitate such an extension (refer Figure 4). Secondary connections should also be made off the end of Lili Road and from Jellicoe Avenue midway between the Cherry Grove and Martindale Lane intersections.

It would be undesirable for any of these routes to attract excessive volumes of through traffic between George Street and Buckland Road. Having three east-west connections will help to spread the east-west traffic. Design of the routes geometry and intersections should be such as to control speeds and, make them unattractive as quick through routes particularly for heavy vehicles.

The Gibson Road/George Street intersection will potentially become significantly busier because of an element of through traffic to and from Buckland Road, and probably to a greater degree because of the future residential development to the west and infill development on Gibson Road. Gibson Road currently serves about 120 households and probably carries around 1000 vpd at its intersection with George Street. This could easily rise to



2,000-3,000 vpd in the future. If a link is developed from the intersection eastwards to Bollard Road (refer Section 8.2 below) then a signal controlled intersection is likely to be warranted. This would not only safely control traffic movements but provide a protected crossing of George Street for pedestrians.



Figure 4 Western end of Gibson Road looking westwards

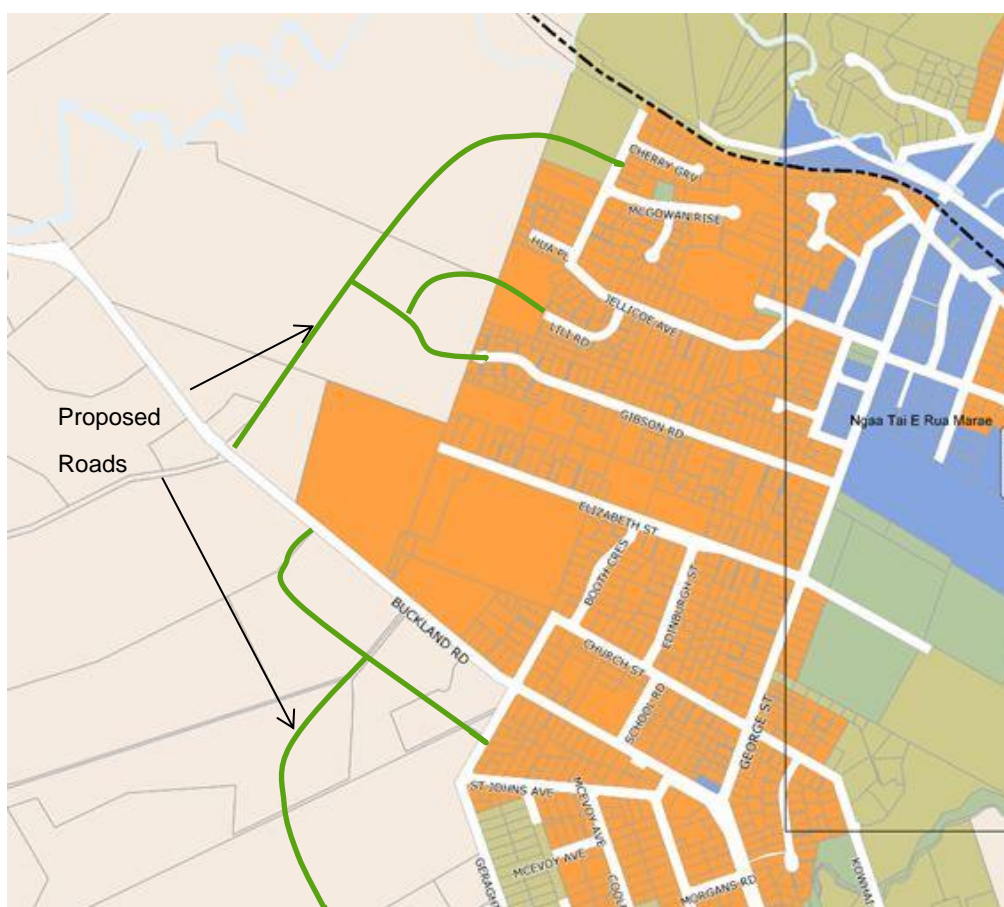


Figure 5 Proposed roads west side

## 8.2 East Side Connectivity

The preferred option for a central connection between the main residential area and the Whangarata Business Park is from opposite Gibson Road on George Street, running along the edge of Dr John Lightbody reserve to a gully crossing with the route then branching into two connections to Bollard Road.

There is potential for north-south links from this east-west route to connect with Tuakau Saleyards Road and Escotts Road, improving the accessibility of future residential development off Escotts Road to the east and south of the Dr John Lightbody Reserve.

Further south, subdivision off Coles Road should be structured to link with a paper road that will connect through to Whangarata Road, providing a localised alternative to using George Street.

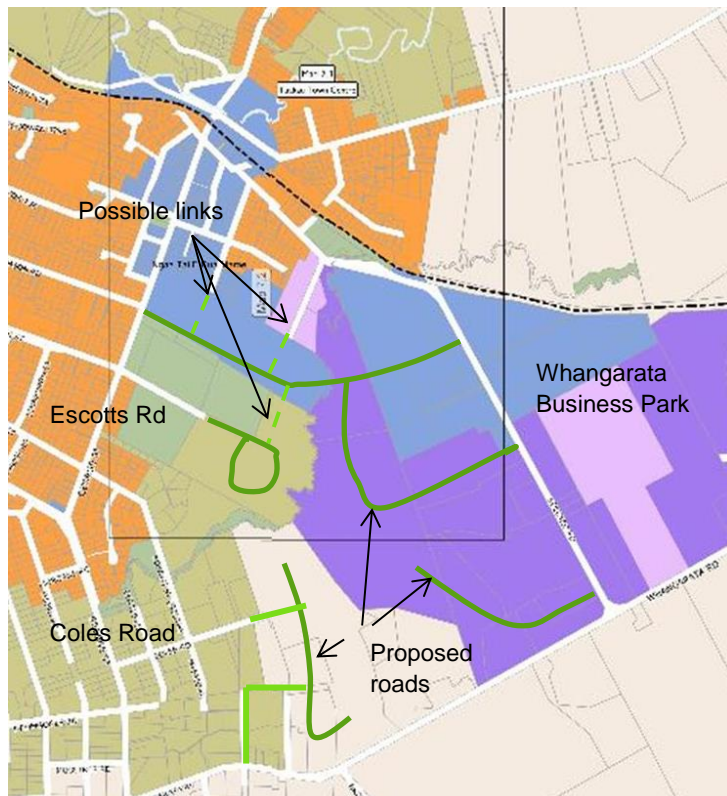


Figure 6 East side connections

In Appendix B is a plan showing these roading proposals against a background of the zoning concepts being considered in this structure planning process.

## 8.3 Network Improvements

As traffic in Tuakau grows, so will the need to upgrade some of the key roads in and beyond the town.

### 8.3.1 Bollard Road

The Whangarata Business Park Structure Plan recommends widening the Bollard Road corridor to 24.5m. The width is based on providing parking on both sides of the carriageway, having a 2m wide footpath both sides and a 2.5m wide shared pedestrian/cycle path on one other side. Presumably it is hoped that developers will vest the required land for road widening during subdivision. This may not be achievable at the northern end of the road where there is already development on both sides. It may also be of more value to enable cyclists to use the road safely rather than to provide on street parking which should be provided for on site for each activity in accordance with the District Plan.

It is suggested that the cross-section which is recommended in the Structure Plan be reviewed and a specific permanent levels design be developed. There is already a need to start urbanising the northern end of Bollard Road with footpaths at least and an appropriate standard of streetlighting.

### 8.3.2 Whangarata Road

The Whangarata Business Park Structure Plan also recommends widening the Whangarata Road corridor to 24.25m and this widening has been provided in one subdivision towards the eastern end of the Business Park frontage to Whangarata Road. The widening was intended to accommodate a service road parallel to Whangarata Road. Such an arrangement has proved inapplicable to the subdivision that has taken place and will likely be similarly inappropriate for the rest of the land fronting Whangarata Road with it being served from internal roads within the Business Park instead.

As with Bollard Road, it is suggested that the cross-section which is recommended in the Structure Plan be reviewed and a specific permanent levels design be developed. As a minimum there should be a 10m wide carriageway in the first instance to provide a more recoverable shoulder which can also accommodate cyclist use. A footpath or shared use path would seem appropriate on the northern side. This target carriageway width should be taken through to Pokeno.

### 8.3.3 Buckland Road

Similarly to Whangarata Road, Buckland Road should be upgraded with wider shoulders and pedestrian and cyclist facilities be extended hand in hand with development on the western side of the town. This upgrading should be undertaken in conjunction with Auckland Council to ensure consistent standards are achieved along the route between Tuakau and Pukekohe.

## 9.0 Residential Growth Options

Following is a commentary on the transportation considerations of residential growth to the north, west and south of the town.

### 9.1 Residential growth to the north

Waikato District Council staff have estimated there is capacity for approximately 11 rural residential and 68 standard residential lots to be developed under the existing zoning accessed from Dominion Road, with 71 standard residential and 23 rural residential lots accessed from the eastern side of Harrisville Road or Barnaby Road, and 50 rural residential lots accessed from the western side of Harrisville Road.

Development accessed from Barnaby Road and Harrisville Road area has positives in that it is relatively close to the town centre, the Bollard Road/Whangarata Business Park area, and Harrisville School, making for short work and retail trips and some school trips. It is also suited to commuters with destinations in the greater Auckland area, which comprised 36% of work destinations for Tuakau people according to the 2006 census.

The Concept Plan has proposed a slight extension to the residential zoning of Barnaby Road and Harrisville Road plus an outer area of Country Living zone located between Barnaby Road and Harrisville Road. This is appropriate and supportable from a transportation perspective. It will extend the residential development to join up with the market gardening industry activities and Harrisville. This would support the improvement of facilities for pedestrians and cyclists along Harrisville Road. An east-west link between Barnaby Road and Harrisville Road would provide useful connectivity. Barnaby Road would require widening and upgrading with urban facilities (e.g footpaths and streetlighting) as development proceeds.

The Concept Plan also indicates an extension of the residential zoning along Dominion Road with a large country living zone beyond that. This is less desirable from a transportation perspective as it creates an increasing number of properties served from a cul-de-sac which is poor for connectivity, efficiency and servicing (including emergency service accessibility).

This shortcoming could be overcome by extending Dominion Road to link with Ridge Road or, to a lesser extent, by extending McCreedy Road to link with Ridge Road. The extension of Dominion Road would be less than one kilometre of new road but the topography is difficult, with small valleys and hills so it would be relatively expensive to construct. Dominion Road beyond the currently urbanised length would also need substantial upgrading. It presently only has a seal width of 6m initially reducing to 5m and also has a poor horizontal and vertical alignment. The southern portion of Ridge Road also has a poor horizontal and vertical alignment which would not be well suited to any substantial increase in traffic volumes. These are not insurmountable deficiencies but funding may be better directed elsewhere.

Connecting Dominion Road to Ridge Road could be expected to attract some traffic which presently uses Harrisville Road to access SH1. That offers some efficiency for the road network but it would not be advisable from a safety viewpoint unless the Dominion Road-Ridge Road route was of a good standard. The environmental effects of increasing traffic on Dominion Road, potentially including some heavy commercial vehicles, would also need to be considered.

Estimating the cost of upgrading and extending Dominion Road and upgrading Ridge Road is beyond the scope of this ITA. There would be a range of options and standards to decide upon, but the cost would likely run to several million dollars. Unless Waikato District Council is prepared to fund such work it would be unwise to contemplate anything more than a minor extension to the current residential zoning.

## **9.2 Residential growth to the west**

For this report the western area is considered as areas between Buckland Road and the NIMTR, and south of Buckland Road as far as Dromgools Road.

Positives for developing this area are the potential for incorporating better links between Buckland Road and the town centre (George Street), better connectivity between the current culs-de-sac, the proximity to Tuakau College, and convenient access to Pukekohe which is a major destination for employment, retail, and commercial trips.

The Concept Plan indicates potential residential areas which would more than double the current area of residential development so are unlikely to all be needed or supportable within the 30 year timeframe of this Structure Plan.

The initial focus would sensibly be on extending and linking Lili Road, Gibson Road and Elizabeth Street, and connecting to Buckland Road via one new intersection. On the south side of Buckland Road, St John's Avenue could be extended from its intersection with Geraghtys Road with a link connecting to Buckland Road in the vicinity of Tuakau College. This would extend bilateral residential development along Buckland Road up to the college, bringing the college into the urban area.

Buckland Road traffic volumes will grow to the level where direct vehicular access would be undesirable for both efficiency and safety reasons. It may be preferable from an urban design perspective to maintain some form of active frontage to Buckland Road including pedestrian access to properties, but vehicular access would preferably be taken from a side street or a service lane to the rear of the properties.

The roads for the limited extent of development suggested on the south side of Buckland Road would sensibly be designed to be able to be extended for further development to the west in the future but that may not need to be considered in detail at this stage. There is a significant area of Rural Residential zoned land east of Geraghtys Road which has yet to be developed and could be changed to a Residential zoning and then accommodate upwards of 200 sections served efficiently via Dromgools Road.

## **9.3 Residential growth to the south**

For this report this area refers to land to the south of Dromgools Road and Whangarata Road, on both sides of River Road.

Development along this length of River Road comprises intermittent businesses including some market gardening and transport operations and the access to a commercial composting operation. These are interspersed with houses with a small cluster around the southern end of River Road. A 70km/h speed restriction applies to River Road from south of Morgans Road to the southern end of the business zone, approximately 300 metres south of Alexandra Redoubt Road. South of this the road has a rural 100km/h speed restriction reflecting the sparseness of development. Where River Road turns at its southern end to run parallel to the Waikato River it appears to lie outside the legal road boundary.

The land between Whangarata Road and the Tuakau Domain could readily be developed as Residential or Rural Residential land, preferably with some form of loop from Whangarata Road and/or Brown Road (the cadastral plans suggest there are unformed roads that would facilitate this).

More intensive development than the current Rural Residential zoning permits between Whangarata Road and Coles Road, and north of Coles Road could also be easily accommodated by the existing roading network. Development on Coles Road could also be extended slightly further east than the current Rural Residential zoning. Such development along Coles Road would be consistent with an extension to Coles Road eastwards to link up with Bollard Road, providing more connectivity for Coles Road and improved accessibility to the



Whangarata Business Park. The extension to Coles Road and its link to Bollard Road would need to be designed to be unattractive to heavy commercial vehicles which should be directed to use Whangarata Road and Bollard Road as their access to the Whangarata Business Park.

The Concept Plan raises the option of large lot residential development off River Road south of the Tuakau Domain. If this were to be allowed the amount of direct access to River Road would preferably be limited by developing some roads linking River Road, Tyson Road and Alexandra Redoubt Road. Traffic issues would therefore not preclude large lot residential development although Waikato District Council may wish to limit how much of this type of development is enabled.

## 10.0 Transport Modes

This section of the report examines planning for the different transport modes.

### 10.1 Road transport

Road transport can be expected to remain the dominant mode for both private and commercial trips, and for freight movement for the Structure Plan period.

In terms of traffic capacity, the only foreseeable improvements needed would be at the Buckland Road/George Street intersection. This intersection in time may require a change from priority control to control by either a small roundabout or traffic signals. As noted in Section 4.3 of this report such a change might also be driven by safety concerns.

If Gibson Road and/or Elizabeth Street are extended to connect with Buckland Road this will provide some relief for the Buckland Road/ George Street intersection but it would not be desirable to encourage use of those roads by excessive amounts of through traffic. Their use should primarily be by traffic generated in the residential area west of George Street.

The George Street/Liverpool Street intersection is probably the next busiest intersection in the town and is key in providing the connection between Harrisville Road and the industrial area of Bollard Road and the Whangarata Business Park. Depending on the traffic generation of the Whangarata Business Park in the future, there could be capacity issues at this intersection and it may become a significant impediment for pedestrians. Some measures to promote the use of Liverpool Street (east) and make George Street less attractive to through traffic could also be worthwhile. The limited space available, the ability to favour certain traffic movements, and accommodating pedestrians makes traffic signal control the likely option.

There has previously been concern about trucks using George Street through the retail precinct and a detour has been signed via St Stephens Avenue. No quantification of the numbers of trucks involved is available but from our observations the localised detour via St Stephens Avenue would appear to be an appropriate response.

Looking further ahead, Tuakau Saleyards Road could be extended southwards to intersect with an extended Escotts Road. This extension to Escotts Road would ideally extend across to Bollard Road providing a link between the Tuakau residential area and the Whangarata Business Park. The Tuakau Saleyards Road – Escotts Road route would provide an alternative to St Stephens Avenue for detouring trucks around the George Street retail precinct.

Elsewhere, there will be no need for adding additional lanes to any roads for capacity, but an upgrading to the standard of Whangarata Road stands out as being needed. Wider shoulders are required to give drivers who lose control of their vehicles more chance of recovering control. The wider shoulders would also greatly improve the suitability and safety for cycling. In addition at least one passing lane in each direction should be planned to avoid heavy commercial vehicles delaying other traffic.

### 10.2 Cycling

There are currently no designated on-road or off-road facilities for cyclists in Tuakau, although its size and mostly flat topography are well suited to cycling for trips within the town. Pukekohe is also within reasonable distance for regular cyclists such as commuters.

The marking of cycle lanes on existing roads is an operational matter rather than a Structure Plan issue. The Structure Plan should however identify potential networks or new facilities.

The size of Tuakau means there are limited demands and opportunities for creating networks, but there is one opportunity where an off road facility is worthy of consideration to be constructed in parallel with new road links. This is the east-west link proposed between George Street from adjacent to the Gibson Road intersection and Bollard Road which will potentially be an attractive commuter route for cyclists and pedestrians and could warrant a shared use path. Running south from this a shared use path could then access the eastern end of the reserve and continue through residential development to run alongside and then across a gully to join Kowhai Street and thence Coles Road. These proposals are shown on the plan in Appendix B.

An option raised through consultation is the possibility of a pedestrian/cycle path alongside the NIMTR between Tuakau and Pukekohe. This has merit and warrants investigation into its viability. KiwiRail would require it to be demonstrated that such a path can be safely accommodated within the rail corridor without compromising the operation and maintenance of the tracks. Fencing of the path from the tracks would be required and it may be necessary to have localised deviations into private property beyond the rail corridor. A deed of grant would need to be held by Waikato District Council and by Auckland Council for the portions of the route that fall within each of their jurisdictions.

### 10.3 Walking

The same comments apply to walking as for cycling with the potential new routes identified above.

Encouragement of walking by making it more pleasant will otherwise be largely be an operational issue, reliant on maintaining and improving existing facilities including crossing facilities of the busier roads.

### 10.4 Rail

Electrification of the NIMTR between Auckland and Pukekohe is planned and will enable an improved commuter service to be offered between Pukekohe and the rest of Auckland. At this time, extension of the electrification to Tuakau to provide a comparable service seems unlikely to be economical, but it is noted that the Waikato Regional Council has undertaken to update a previous review of the viability of a passenger service between Hamilton and Auckland which could include a stop at Tuakau.

In brief, it appears that a passenger service should not be written off as a long term possibility and should not be allowed to be precluded by development, but does not seem likely to eventuate in the short to medium term.

A rail siding for freight at the Whangarata Business Park looks to be achievable and may be viable if a business establishes in the Business Park which generates a product that needs to be taken to port.

## 11.0 Conclusions

Key recommendations emanating from this assessment are listed below.

- 1) The extent of development along Dominion Road should be limited as it is difficult and is unlikely to be economical to upgrade and extend Dominion Road to Ridge Road, or to link it to Barnaby Road to provide some network connectivity. Without such connectivity it would become an inefficiently serviced cul-de-sac placing increasing pressure on the Dominion Road/Harrisville Road intersection.
- 2) Large lot/rural residential subdivision could be suitably accommodated in the triangle between Barnaby Road and Harrisville Road with a road linking the two.
- 3) A connection from Gibson Road to Buckland Road should be planned with links off this to Lili Road and Jellicoe Road and a pedestrian/cycle link to Elizabeth Street.
- 4) A crossroads intersection with Gibson Road on George Street would be a suitable location for an east-west link to connect with the Whangarata Business Park. There are options to join either/or Tuakau Saleyards Road and Carr Street to this east-west link to improve localised north-south connectivity.
- 5) Staging of development on the western side would appear to be better focussed north of Buckland Road initially because of proximity to the schools and town centre and the benefits of establishing links between the town centre and Buckland Road. Development on the south side of Buckland Road should be staged to progress eastwards from Geraghtys Road but infilling between Geraghtys Road and George Street should be substantially completed before developing west of Geraghtys Road.

- 6) Development south of Alexandra Redoubt Road could easily be serviced in roading terms from existing roads and paper roads, but would be a poor land use/transport planning outcome as the area is distant from the town centre and most facilities.

## Appendix A

# Crash Records



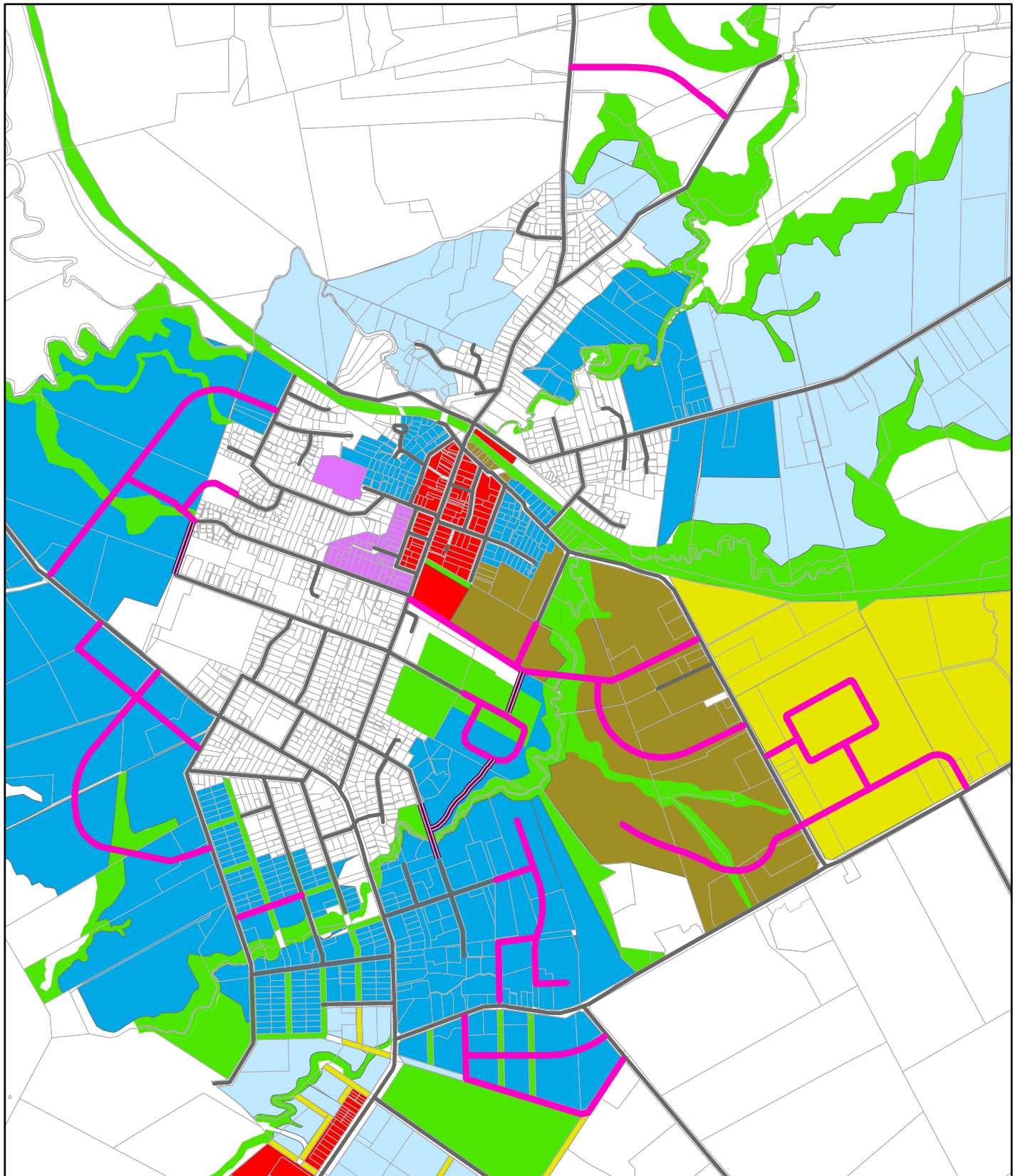
| First Street     | D  Second street<br> I  or landmark<br>Distance  R | Crash<br>  Number | Date<br>  DD/MM/YYYY | Day Time<br>DDD HHMM | Description of Events  | Crash Factors<br>  (ENV = Environmental factors)   | Road<br> | Natural<br>Light | Weather    | Junction        | Cntrl         | Tot Inj<br>F S M<br>A E I<br>T R N |
|------------------|--|-------------------|----------------------|----------------------|--|--|----------|------------------|------------|-----------------|---------------|------------------------------------|
| HARRISVILLE ROAD | 210S BARNABY ROAD S                                | 201204226         | 08/09/2012           | Sat 1216             | CAR1 SBD on HARRISVILLE ROAD hit rear of left turning CAR2   | CAR1 failed to notice car slowing, attention diverted by other traffic<br>ENV: entering or leaving private house / farm  | Dry      | Overcast         | Fine       | Driveway        | Nil           | 2                                  |
| HARRISVILLE ROAD | 200N DOMINION ROAD                                 | 2934368           | 02/03/2009           | Mon 2330             | SUV1 SBD on HARRISVILLE ROAD lost control turning right, SUV1 hit Fence, Post Or Pole on right hand bend | SUV1 attention diverted by passengers  | Dry      | Dark             | Fine       | Unknown         | Nil           |                                    |
| HARRISVILLE ROAD | I DOMINION ROAD                                    | 201336190         | 17/05/2013           | Fri 2030             | CAR1 WBD on DOMINION ROAD hit CAR2 merging from the left   | CAR2 failed to give way at give way sign, didnt see/look when required to give way to traffic from another direction   | Wet      | Dark             | Light Rain | X Type Junction | Give Way Sign |                                    |
| HARRISVILLE ROAD | I RYDERS ROAD                                      | 201338649         | 13/09/2013           | Fri 0815             | VAN1 SBD on HARRISVILLE ROAD hit CAR2 merging from the right   | CAR2 failed to give way at give way sign, didnt see/look when visibility limited by roadside features, new driver showed inexperience ENV: visibility limited by building  | Dry      | Bright           | Fine       | X Type Junction | Give Way Sign |                                    |
| MARTINDALE LANE  | I MCGOWAN RISE                                     | 201339091         | 22/10/2013           | Tue 0700             | CAR2 turning right hit by oncoming VAN1 WBD on MARTINDALE LANE   | CAR2 failed to give way when turning to non-turning traffic, attention diverted by driver dazzled by sun/lights  | Dry      | Bright           | Fine       | T Type Junction | Nil           |                                    |
| LIVERPOOL ST     | 15N GEORGE ST                                      | 201236013         | 02/05/2012           | Wed 1800             | CAR1 NBD on LIVERPOOL ST hit rear of left turning CAR2   | CAR1 following too closely, attention diverted by driver dazzled by sun/lights ENV: entering or leaving car parking building / area  | Dry      | Bright           | Fine       | Driveway        | Give Way Sign |                                    |
| GEORGE ST        | I LIVERPOOL ST                                     | 201003689         | 15/07/2010           | Thu 1743             | CYCLIST1 (Age 31) SBD on GEORGE ST hit CAR2 turning right onto GEORGE ST from the left                   | CAR2 failed to give way at give way sign, didnt see/look when required to give way to traffic from another direction   | Dry      | Twilight         | Fine       | X Type Junction | Give Way Sign | 1                                  |
| GEORGE ST        | I LIVERPOOL ST                                     | 201102811         | 19/03/2011           | Sat 2014             | CAR1 WBD on LIVERPOOL ST hit CAR2 crossing at right angle from right                                     | CAR1 alcohol test above limit or test refused, failed to give way at give way sign, misjudged intentions of another party  | Dry      | Bright           | Fine       | X Type Junction | Give Way Sign | 1                                  |
| LIVERPOOL ST     | I GEORGE ST  | 201142463         | 15/09/2011           | Thu 1915             | VAN1 NBD on GEORGE ST cutting corner hit CAR2 head on  | VAN1 cutting corner at intersection  | Wet      | Dark             | Light Rain | X Type Junction | Give Way Sign |                                    |
| GEORGE ST        | 20S LIVERPOOL ST                                   | 201044711         | 25/08/2010           | Wed 1300             | CAR1 NBD on GEORGE ST hit Parked Vehicle while manoeuvring   | CAR1 misjudged speed of own vehicle  | Dry      | Bright           | Fine       | Unknown         | Nil           |                                    |
| GEORGE ST        | 50S LIVERPOOL ST                                   | 2943991           | 01/09/2009           | Tue 0826             | CAR1 WBD on GEORGE ST hit CAR2 manoeuvring   | CAR1 didnt see/look behind when reversing/manoeuvring  | Dry      | Bright           | Fine       | Unknown         | Nil           |                                    |
| GEORGE ST        | 80S LIVERPOOL ST                                   | 201041309         | 30/09/2010           | Thu 1146             | CAR1 WBD on GEORGE ST hit SUV2 manoeuvring   | CAR1 didnt see/look behind when reversing/manoeuvring SUV2 didnt see/look behind when reversing/manoeuvring ENV: entering or leaving other commercial  | Wet      | Overcast         | Light Rain | Driveway        | Nil           |                                    |
| JELlicoe AVENUE  | I LILI ROAD  | 201235125         | 11/05/2012           | Fri 2158             | CAR1 WBD on JELlicoe AVENUE hit CAR2 turning right onto JELlicoe AVENUE from the left                    | CAR2 didnt see/look when required to give way to traffic from another direction  | Wet      | Dark             | Light Rain | T Type Junction | Nil           |                                    |
| JELlicoe AVENUE  | 20S VILLAGE PLACE                                  | 201035181         | 16/06/2010           | Wed 1750             | VAN1 SBD on JELlicoe AVENUE hit CAR2 doing driveway manoeuvre  | CAR2 failed to give way at driveway, didnt see/look behind when reversing/manoeuvring, didnt see/look when required to give way to traffic from another direction<br>ENV: entering or leaving private house / farm | Dry      | Twilight         | Fine       | Driveway        | Nil           |                                    |
| CARR ST          | 70S LIVERPOOL ST                                   | 201133815         | 29/01/2011           | Sat 0025             | VAN1 SBD on CARR ST lost control turning right, VAN1 hit Post Or Pole on right hand bend                 | VAN1 alcohol test above limit or test refused, inexperience ENV: entering or leaving car parking building / area   | Wet      | Dark             | Heavy Rain | Driveway        | Nil           |                                    |

| First Street       | D  Second street<br> I  or landmark<br>Distance  R | Crash<br>  Number | Date<br>  DD/MM/YYYY | Day Time<br>DDD HHMM | Description of Events   | Crash Factors<br>  (ENV = Environmental factors)   | Road<br> | Natural<br>Light | Weather    | Junction        | Cntrl         | Tot Inj<br>F S M<br>A E I<br>T R N |
|--------------------|--|-------------------|----------------------|----------------------|---|--|----------|------------------|------------|-----------------|---------------|------------------------------------|
| HENDERSON AVENUE   | I JELlicoe AVENUE                                  | 201006474         | 04/11/2010           | Thu 2000             | CAR1 NBD on HENDERSON AVENUE hit CAR2 crossing at right angle from right, CAR2 hit Fence, Tree    | CAR1 failed to give way to traffic approaching/crossing from the right   | Dry      | Dark             | Fine       | T Type Junction | Nil           | 1                                  |
| GEORGE ST          | I MADILL ROAD                                      | 2905264           | 11/08/2009           | Tue 0630             | TRUCK1 WBD on MADILL ROAD turning right hit MOTOR CYCLE2 turning right into MADILL ROAD           | TRUCK1 failed to give way at give way sign, didnt see/look when required to give way to traffic from another direction   | Dry      | Dark             | Fine       | X Type Junction | Give Way Sign | 1                                  |
| ST STEPHENS AVENUE | I MADILL ROAD                                      | 201302512         | 19/04/2013           | Fri 2040             | CAR1 EBD on MADILL ROAD lost control turning left, CAR1 hit Kerb                                  | CAR1 alcohol test below limit, too fast entering corner, lost control when turning   | Wet      | Dark             | Fine       | T Type Junction | Give Way Sign | 1                                  |
| BOLLARD ROAD       | 30S PARK AVENUE                                    | 2902632           | 27/03/2009           | Fri 1707             | CAR1 NBD on BOLLARD ROAD hit PEDESTRIAN2 (Age 17) crossing road from left side                    | PEDESTRIAN2 crossing heedless of traffic PEDESTRIAN3 crossing heedless of traffic  | Dry      | Bright           | Fine       | Unknown         | Nil           | 2                                  |
| GEORGE ST          | 10S HALL ST  | 201103519         | 27/06/2011           | Mon 1846             | passenger fell while boarding SUV1  | SUV1 boarding moving vehicle, riding in insecure position  | Wet      | Dark             | Fine       | T Type Junction | Nil           | 1                                  |
| CARR ST            | 30S MADILL ROAD                                    | 2937678           | 05/08/2009           | Wed 1145             | TRUCK1 NBD on CARR ST hit obstruction, TRUCK1 hit Other   | TRUCK1 overdimension vehicle or load   | Dry      | Bright           | Fine       | Unknown         | Nil           |                                    |
| GEORGE ST          | 100W JELlicoe AVENUE                               | 201238111         | 20/06/2012           | Wed 1320             | SUV1 EBD on GEORGE ST hit CAR2 parking/unparking  | CAR2 emotionally upset/road rage   | Dry      | Bright           | Fine       | Unknown         | Nil           |                                    |
| GIBSON ROAD        | 40W ARAWHATA WAY                                   | 201140676         | 21/08/2011           | Sun 2000             | CAR1 EBD on GIBSON ROAD hit parked veh, CAR1 hit Parked Vehicle                                   | CAR1 too far left/right  | Dry      | Dark             | Fine       | Unknown         | Nil           |                                    |
| GEORGE ST          | I GIBSON ROAD                                      | 201238724         | 13/09/2012           | Thu 1745             | CAR1 EBD on GIBSON ROAD missed inters or end of road, CAR1 hit Fence, Kerb                        | CAR1 alcohol suspected, too fast entering corner   | Dry      | Overcast         | Fine       | T Type Junction | Give Way Sign |                                    |
| ELIZABETH ST       | 80W BOOTH CRESCENT                                 | 2931664           | 07/03/2009           | Sat 1400             | CAR1 EBD on ELIZABETH ST hit obstruction, CAR1 hit Stray Animal                                   | ENV: household pet rushed out or playing   | Dry      | Bright           | Fine       | Unknown         | N/A           |                                    |
| GEORGE ST          | 30N ESCOTTS ROAD                                   | 2906446           | 12/09/2009           | Sat 2000             | CAR1 SBD on GEORGE ST hit rear end of CAR2 stop/slow for PEDESTRIAN                               | CAR1 failed to notice car slowing  | Dry      | Twilight         | Fine       | Unknown         | Nil           | 1                                  |
| EDINBURGH ST       | I CHURCH ST  | 201041954         | 10/10/2010           | Sun 1347             | CAR1 NBD on EDINBURGH ST lost control; went off road to left, CAR1 hit Fence                      | CAR1 lost control, showing off wheelspins etc  | Dry      | Bright           | Fine       | T Type Junction | Nil           |                                    |
| GEORGE ST          | I CHURCH ST  | 201039829         | 16/08/2010           | Mon 0435             | CAR1 SBD on GEORGE ST lost control turning right, CAR1 hit Fence, Post Or Pole on right hand bend | CAR1 too fast entering corner  | Dry      | Dark             | Fine       | X Type Junction | Stop Sign     |                                    |
| BUCKLAND ROAD      | 200N GEORGE ST                                     | 201035924         | 26/05/2010           | Wed 1340             | CAR1 NBD on BUCKLAND ROAD lost control; went off road to right, CAR1 hit Traffic Sign             | CAR1 suddenly swerved to avoid vehicle CAR2 suddenly swerved to avoid vehicle  | Wet      | Overcast         | Light Rain | Unknown         | Nil           |                                    |
| BUCKLAND ROAD      | 50E THORN ROAD                                     | 201204102         | 07/08/2012           | Tue 0855             | SUV1 WBD on BUCKLAND ROAD hit CAR2 U-turning from same direction of travel                        | CAR2 didnt see/look behind when changing lanes, position or direction  | Dry      | Bright           | Fine       | Unknown         | Nil           | 1                                  |
| BUCKLAND ROAD      | 20N GEORGE ST                                      | 201242364         | 13/12/2012           | Thu 0700             | CAR1 NBD on BUCKLAND ROAD overtaking CAR2   | CAR1 overtaking on left  | Dry      | Bright           | Fine       | Unknown         | Nil           |                                    |
| BUCKLAND ROAD      | I GEORGE ST  | 2902922           | 05/05/2009           | Tue 0830             | CAR2 turning right hit by oncoming SUV1 EBD on BUCKLAND ROAD                                      | CAR2 failed to give way when turning to non-turning traffic, didnt see/look when required to give way to traffic from another direction                                      | Dry      | Bright           | Fine       | T Type Junction | Give Way Sign | 1                                  |
| GEORGE ST          | I BUCKLAND ROAD                                    | 201033225         | 20/03/2010           | Sat 1815             | CAR2 turning right hit by oncoming CAR1 SBD on BUCKLAND ROAD                                      | CAR2 failed to give way when turning to non-turning traffic, attention diverted by other traffic, didnt see/look when required to give way to traffic from another direction | Dry      | Bright           | Fine       | T Type Junction | Give Way Sign |                                    |
| GEORGE ST          | I BUCKLAND ROAD                                    | 201034739         | 29/05/2010           | Sat 0900             | CAR2 turning right hit by oncoming CAR1 EBD on BUCKLAND ROAD                                      | CAR2 failed to give way when turning to non-turning traffic, didnt see/look when required to give way to traffic from another direction                                      | Wet      | Overcast         | Light Rain | T Type Junction | Give Way Sign |                                    |

| First Street    | D  Second street<br>I  or landmark<br>Distance  R | Crash<br>Number | Date<br>DD/MM/YYYY | Day Time<br>DDD HHMM | Description of Events  | Crash Factors<br>( ENV = Environmental factors)   | Road Natural<br>Light | Weather  | Junction   | Cntrl           | Tot Inj<br>F S M<br>A E I<br>T R N |   |
|-----------------|---|-----------------|--------------------|----------------------|--|---|-----------------------|----------|------------|-----------------|------------------------------------|---|
| GEORGE ST       | I BUCKLAND ROAD                                   | 201035652       | 20/06/2010         | Sun 1000             | CAR2 turning right hit by oncoming CAR1 SBD on BUCKLAND ROAD                                     | CAR2 failed to give way when turning to non-turning traffic, attention diverted by passengers   | Wet                   | Overcast | Light Rain | T Type Junction | Give Way Sign                      |   |
| BUCKLAND ROAD   | I GEORGE ST                                       | 201003632       | 14/07/2010         | Wed 1305             | CYCLIST1 (Age 15) WBD on BUCKLAND ROAD hit VAN2 crossing at right angle from right               | CYCLIST1 failed to give way to traffic approaching/crossing from the right, attention diverted by driver dazzled by sun/lights                                | Dry                   | Bright   | Fine       | T Type Junction | Give Way Sign                      | 1 |
| BUCKLAND ROAD   | I GEORGE ST                                       | 201136195       | 28/06/2011         | Tue 1709             | CAR2 turning right hit by oncoming CAR1 SBD on BUCKLAND ROAD                                     | CAR2 failed to give way when turning to non-turning traffic, misjudged intentions of another party  | Wet                   | Overcast | Fine       | T Type Junction | Give Way Sign                      |   |
| GEORGE ST       | 20E BUCKLAND ROAD                                 | 201038808       | 31/07/2010         | Sat 1100             | CAR1 EBD on GEORGE ST hit CAR2 merging from the left   | CAR2 failed to give way at driveway, didnt see/look when required to give way to traffic from another direction ENV: entering or leaving private house / farm | Dry                   | Bright   | Fine       | Driveway        | Nil                                |   |
| MORGANS ROAD    | 50W GEORGE ST                                     | 201330708       | 30/01/2013         | Wed 1746             | parked CAR1 EBD on MORGANS ROAD ran away, CAR1 hit Traffic Sign                                  | CAR1 parking brake not fully applied  | Dry                   | Bright   | Fine       | Unknown         | Nil                                |   |
| WHANGARATA ROAD | I BOLLARD ROAD                                    | 2944403         | 28/11/2009         | Sat 1530             | CAR1 WBD on WHANGARATA ROAD lost control turning right, CAR1 hit Post Or Pole on right hand bend | CAR1 lost control due to road conditions ENV: road slippery (loose material on seal)  | Wet                   | Overcast | Light Rain | T Type Junction | Give Way Sign                      |   |
| BOLLARD ROAD    | I WHANGARATA ROAD                                 | 201032999       | 04/02/2010         | Thu 1200             | TRUCK1 WBD on BOLLARD ROAD lost control turning right, TRUCK1 hit Fence on right hand bend       | TRUCK1 inexperience, load too heavy   | Dry                   | Bright   | Fine       | T Type Junction | Give Way Sign                      |   |
| GEORGE ST       | 10S DROMGOOLS ROAD                                | 201033222       | 25/03/2010         | Thu 0840             | CAR1 NBD on GEORGE ST hit rear end of CAR2 stop/slow for queue                                   | CAR1 following too closely  | Dry                   | Bright   | Fine       | X Type Junction | Stop Sign                          |   |
| WHANGARATA ROAD | 660W BOLLARD ROAD                                 | 201005071       | 17/09/2010         | Fri 1852             | CAR1 WBD on WHANGARATA ROAD hit obstruction, CAR1 hit Other                                      | ENV: road obstructed (fallen tree or branch)  | Wet                   | Dark     | Heavy Rain | Unknown         | Nil                                | 2 |
| GEORGE ST       | 100N MCGUIRES ROAD                                | 201239980       | 07/12/2012         | Fri 1523             | TRUCK1 SBD on GEORGE ST hit VAN2 U-turning from same direction of travel                         | VAN2 didnt see/look behind when changing lanes, position or direction   | Wet                   | Overcast | Light Rain | Unknown         | Nil                                |   |
| WHANGARATA ROAD | I BROWN ROAD                                      | 201105437       | 20/12/2011         | Tue 1430             | TRUCK1 EBD on WHANGARATA ROAD hit CAR2 headon on straight  | TRUCK1 lost control under heavy braking   | Wet                   | Overcast | Light Rain | T Type Junction | Nil                                | 2 |
| GEORGE ST       | I WHANGARATA ROAD                                 | 2936319         | 24/01/2009         | Sat 2000             | CAR1 SBD on GEORGE ST hit VAN2 turning right onto GEORGE ST from the left                        | VAN2 failed to give way at give way sign, failed to give way when turning to non-turning traffic  | Dry                   | Bright   | Fine       | T Type Junction | Give Way Sign                      |   |
| WHANGARATA ROAD | I GEORGE ST                                       | 201104081       | 14/07/2011         | Thu 1559             | CAR1 SBD on GEORGE ST lost control on curve and hit SUV2 head on, CAR1 hit Vehicle               | CAR1 alcohol test below limit, too fast entering corner, lost control when turning SUV2 alcohol test below limit  | Wet                   | Overcast | Light Rain | T Type Junction | Give Way Sign                      | 3 |
| WHANGARATA ROAD | I RIVER ROAD                                      | 201358983       | 16/12/2013         | Mon 1600             | CAR1 WBD on WHANGARATA ROAD hit rear end of CAR2 stop/slow for cross traffic                     | CAR1 following too closely, attention diverted by cell phone  | Dry                   | Bright   | Fine       | T Type Junction | Give Way Sign                      |   |

## Appendix B

# Roading Proposals Plan



## Legend

### Tuakau - Land Use

- Commercial
- Heavy Industrial
- Large Lot
- Light Industrial
- Low Density Res
- Med Density Res
- Open space

- Proposed Cycle Lane
- Proposed Road
- Existing Road
- Master\_Parcel