Silverdale Business Land Assessment

17 May 2018 –draft final

m.e consulting

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1 Introduction

Market Economics (M.E) was commissioned by Auckland Council to provide an assessment of the business land requirements in the Silverdale Wainui Dairy Flat Future Urban Zone.

1.1 Background

Silverdale is a long-established community located at the entrance to the Whangaparaoa Peninsula, some 30 km north of the Auckland CBD. The area is now one of high growth, and recently a large retail centre has developed adjacent to an existing small local centre, to provide for the needs of the growing population in the area. To date that growth has been predominantly east of State Highway 1, but very significant future growth will also occur to the west of the Highway, requiring a large amount of new infrastructure, including retail and services space, and new local employment opportunities.

This assessment has been commissioned by Auckland Council to contribute to planning for that growth. Just over 3,200ha of land in Silverdale Wainui Dairy Flat was zoned Future Urban Zone (FUZ), and just over 300ha with live urban zonings, in the operative in part Auckland Unitary Plan (AUP) to accommodate future growth in northern Auckland. That FUZ zoning indicates an intention that the land will in the future change from the current rural use to some alternative (urban and business) use, and is therefore a transitional zone. Conversion to use for urban activities can only occur following due process, which involves preparation of a structure plan and subsequently a plan change to rezone the land for urban purposes. That process requires consideration of the type and extent of the proposed urban activities, including in the context of the surrounding urban environment.

Auckland Council (Council), Auckland Transport, and the NZ Transport Agency have undertaken a high-level assessment of preferred land uses for the Silverdale Wainui Dairy Flat (SWDF) FUZ (the "Supporting Growth" study), including residential, business land and centres, along with transport infrastructure.

1.2 Objective

The purpose of this report is to make independent recommendations as to the appropriate area required in Silverdale Wainui Dairy Flat for and the location of current and future business land (defined for the purposes of this assessment as land with a Light Industry or Heavy Industry zoning), with reference to Council's work. The recommendations are to take into account the Future Urban Zone in the area, the neighbouring rural areas, the existing Hibiscus Coast and North Shore, along with the characteristics and capacity of the area to accommodate growth.

2 Methodology

This section describes the methodology applied to project future demand for business land in SWDF.

2.1 Background

Demand for business (Light and Heavy Industry) land followed an approach applied for the AUP hearings in 2016. For that work M.E was commissioned by Council to undertake an assessment of region-wide business land demand. Subsequently M.E was asked by the Hearings Panel to undertake a detailed assessment (the 'IHP work') to address several key matters of interest.

The approach applied for that assessment was to:

- Define six sub-regional catchments, four urban catchments (North, South, Central and West) and two rural catchments (North and South).
- Quantify current employment, and project future employment in each catchment, and in each of 48 economic sectors.
- Establish a relationship between employment in each of the 48 sectors and the zone in which it locates.
- Apply an estimate of the workspace ratio (WSR) required to accommodate each employee. This is a measure of floorspace per employee.
- Convert floorspace estimates to land area estimates, using floor area ratios (FAR[1]).

The assessment was undertaken for all business zones (Light and Heavy Industry, Mixed Use, General Business etc.) separately, using detailed land use survey data relating to employment density and built form. For this project the same approach was applied, although with some specific consideration of employment distributions in southern Rodney, as described below, and limited to the LIZ and HIZ.

The IHP work has now been updated as part of the Council's National Policy Statement on Urban Development Capacity (the "NPS"). The results changed relatively little from the IHP work, given that the large mass of commercial supply that has not changed since the IHP work. Background to the NPS work is provided in section 3.4.

2.2 Current employment distribution

The first stage in the assessment of business land demand is quantifying current employment by location within south Rodney, which was done as follows:

[1] A measure of development intensity which is a ratio of a building's total floor area to the land area the building occupies. If the building is single level, a FAR of 0.4 indicates the building footprint takes up 40% of the site. A two-level building which occupies 40% of the site would have a FAR of 0.8.

- Define catchments relevant to assessing demand for Silverdale's business land, using as a base the Urban North catchment used in the IHP/NPS work, and then including smaller subcatchments for Method 2 of this project, as described in section 4.2.1.
- Source Statistics NZ Business Directory data (2016) for total employment in each meshblock by ANZSIC industry sector.
- Source GIS zoning files from Council, and quantify meshblocks' zoned area by zone type.
- Allocate each employment sector (ANZSIC) to the type of zone it is most likely to occupy. For example, in a meshblock where there is an area zoned residential, some rural land and land zoned Light Industry, assume that manufacturing employment is located in the Light Industry zone. In practice many meshblocks have only one or two zones, and so the allocation of employment to zone is straight forward, and all instances of very large employment meshblocks were checked manually to accurately allocate large employers to the correct zone, using aerial photography. The output of this is total employment in the catchment by meshblock and by zone. Of most relevance to this assessment, this output yields total 2016 employment on Light Industry land in the study area, which is the basis of the land demand projections.

This process was applied to calculate the distribution of employment in the Light Industry zone (LIZ), and Heavy Industry zone (HIZ)

2.3 Vacant Business land assessment

An assessment of vacant land is in some cases subjective. Sometimes referred to as 'vacant potential', land can be partly occupied but significantly underutilised for its zoned purpose. For example, several buses parked on a large LIZ parcel next to a small shed indicates some degree of use, however with potential for redevelopment. This type of land has been assessed as vacant for this study.

Subjectivity arises because not all low intensity uses indicate redevelopment potential. Many industrial uses such as yards, depots and storage areas are required to support the function of industrial zones, but are low intensity, and do not necessarily require buildings. These type of activities have been assessed as not vacant for this study, because even though they might be low intensity, and therefore able to be replaced by a more intensive use of land, they would then likely have to relocate to other business land elsewhere. For this study every site in North Shore City and southern Rodney was reviewed individually, using aerial photography from two sources and using Google Streetview and online searches to cross check activity types and development changes. In some cases this resulted in changes to the vacant capacity that was applied in the NPS.

2.4 Employment projections

The key output from the current employment distribution (2016 employment on business land in the study area) is then used as the starting point for projections of future employment on SWDF's business zoned land. Three different scenarios were employed to project demand for future industrial land (labelled as several employees per household):

- Method 1 (Urban North): the IHP work divided the Auckland Region into six parts[2], and projected industrial land demand for each. The study area is within the Urban North area, and so the employment and land projections for the Urban North are used to assess potential demand for land in each business zone (LIZ and HIZ) in SWDF.
- Method 2 (Catchment): this method drives future demand for business land in the study area by household growth in the area, so that the future employee per household ratio is the same as current, and employment grows at the same rate as household growth.

Land demand projections present the range assessed under those scenarios.

2.5 Land demand projections

For each of the employment projections methods described above, the next step is to calculate the floorspace and land area required to accommodate that employment. That process is the same as the modelling undertaken for the AUP hearings, as follows:

- Apply an estimate of the workspace ratio (WSR) required to accommodate each employee. This is a measure of floorspace per employee.
- Convert floorspace estimates to land area estimates, using floor area ratios (FAR).

For this assessment a key assumption is what density to assume for future employment. The AUP assessment was undertaken for sub regional catchments (as described in section 2.6). As described above, the IHP work was undertaken for six sub regional catchments, and the Urban North's WSR and FAR were applied for this assessment's demand projections for land zoned LIZ and HIZ.

2.6 Growth projections

Household projections used in the assessment were derived from information supplied from Council's ART (Auckland Regional Transport) Model. The ART model produces a preferred set of projections, which were adopted for this study, and the ART output used was "Scenario I Modified, Version 11". In the FUZ, the ART model understates the likely quantum of growth, and so the Future Urban Land Supply Strategy (2017) (FULSS) was used to inform the ultimate number of households in the FUZ, and when they might form. There is a high degree of uncertainty about that formation profile, given the relatively long time until the area becomes development ready, however the important point is the ultimate capacity of the area, as that is what will be the key driver of ultimate centre size.

Council's ART Model growth projections have a 2046 horizon, and so to the 2048 estimates presented in this report are extrapolated from the times series of ART projections. Some ART zones are projected to have reached capacity by 2046, in which case nil additional growth is applied for them to 2048.

[2] Four urban areas (Central, North, West and South) and two rural area (North and South)

3 Silverdale Business land

This section summarises the current distribution and amount of business land in the study area, and provides a summary of the FULSS.

3.1 Business land zoning

This study has assessed existing live zoned areas in and around Silverdale to provide an indication of current business land supply. Data from Auckland Council was sourced to quantify total vacant and vacant potential land within each area, and that data was then checked using aerial photography to take into account recent developments. Relevant to this study are four main areas of Business land at:

- North Shore (469ha LIZ, across all areas).
- the existing industrial area around Forge and Foundry Roads in Silverdale (57ha LIZ, and 29ha HIZ).
- a small area of 11.3ha LIZ at Dairy Flat.
- a larger 30.3ha area of LIZ at the Highgate Business Park near Millwater, where most sites have been sold and many are currently being built on, although all are recorded as vacant for this assessment (Figure 3.1).

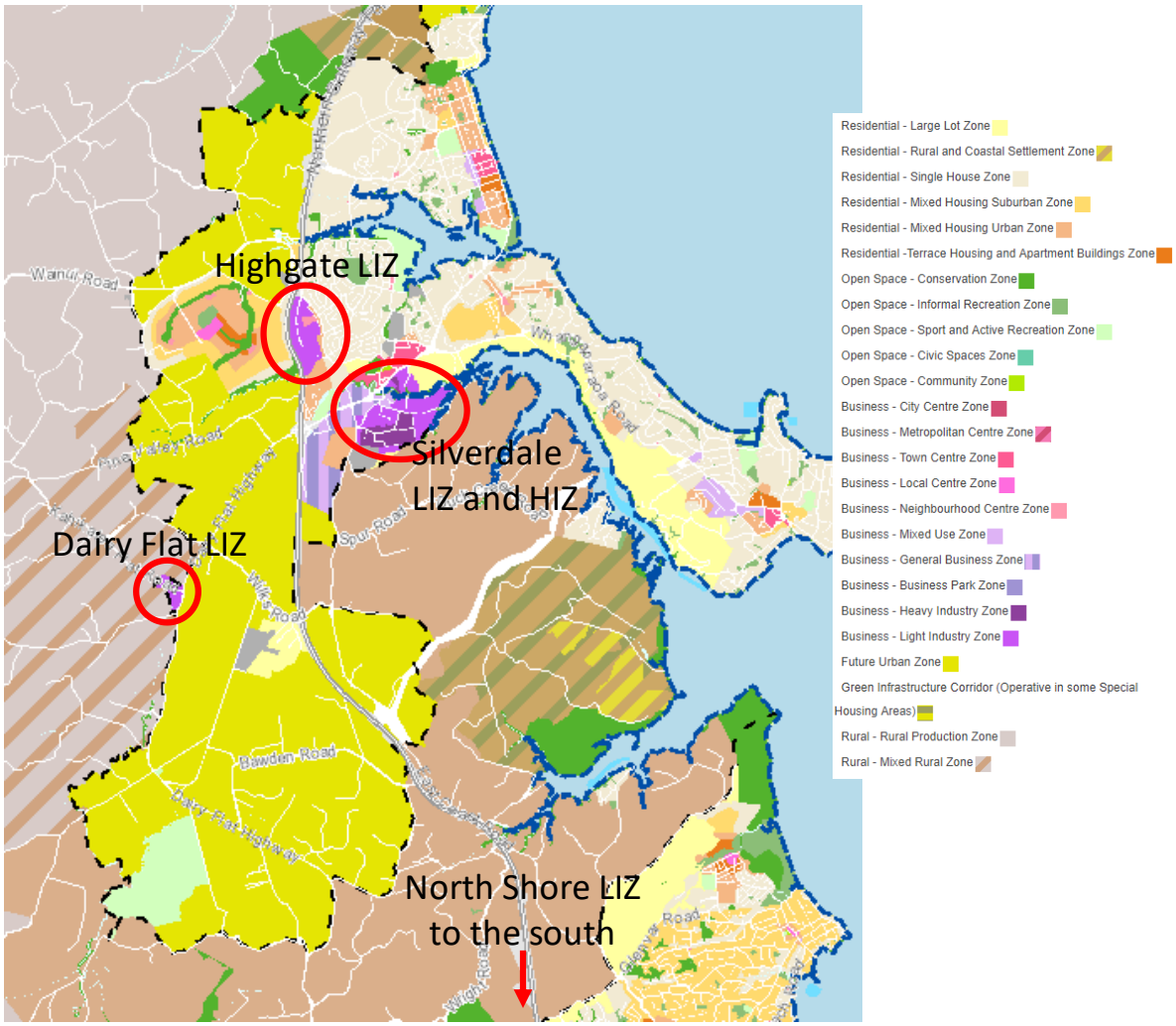
Figure 3.1: North Shore and Southern Rodney Business Land stocks (ha, 2017)

	Total Zoned Area		Vacant		Vacant %	
	Light Industry Zone	Heavy Industry Zone	Light Industry Zone	Heavy Industry Zone	Light Industry Zone	Heavy Industry Zone
North Shore City	469.1	-	8.8	-	2%	0%
Silverdale	57.3	28.6	18.1	2.5	32%	9%
Dairy Flat	11.3	-	6.6	-	58%	0%
Highgate	30.3	-	30.3	-	100%	0%
Total	568.0	28.6	63.8	2.5	11%	9%

In total across the four areas there is 568ha zoned for LIZ, and 29ha for HIZ, of which 64ha LIZ (11%) and 2.5ha HIZ (9%) are vacant land. In total 79% of the Business land across North Shore and Southern Rodney is within North Shore, but only 13% of the vacant land (9ha) is there. This indicates that there is already some pressure on Business land on the North Shore, and given the more mature nature of the urban environment there, this implies that SWDF will accommodate most of the future growth in Business land north of the Harbour Bridge.

The spatial distribution of that Business land is shown in Figure 3.2.

Figure 3.2: Silverdale Wainui Dairy Flat Business land (operative AUP zoning, as at July 2017)



3.2 FULSS

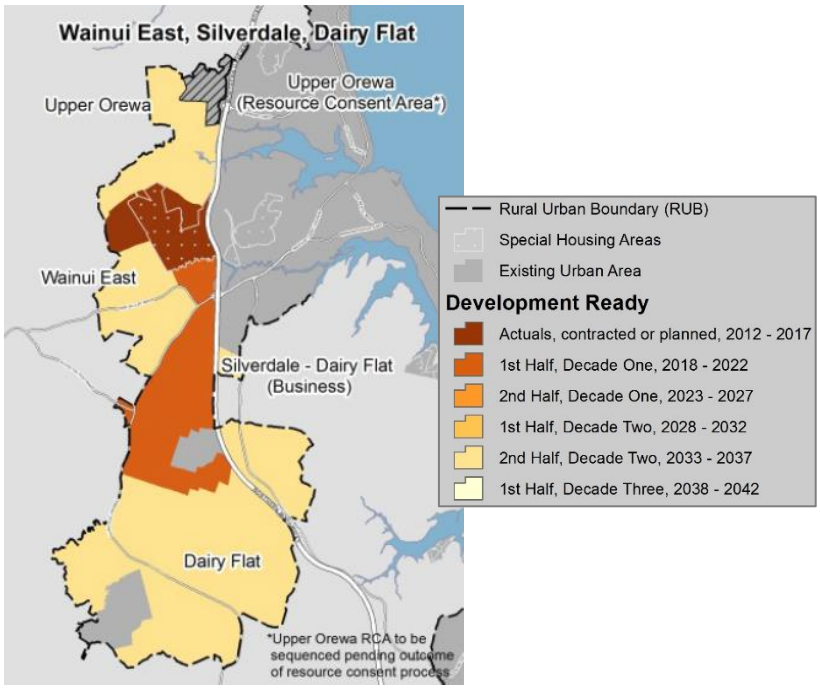
The Future Urban Land Supply Strategy (2017) sets out the order in which FUZ land in Auckland is expected to be made available for development over the next 30 years. Six areas within SWDF are delineated in the FULSS, and are identified as to when they will be development ready:

- Upper Orewa resource consent area - ready for development now
- Wainui East – 2017, live zoned
- Silverdale Wainui Dairy Flat FUZ (Business) (2018-2022)
- Silverdale Wainui Dairy Flat FUZ (remainder) (2033-2037)
- Wainui East FUZ (remainder) (2033-2037)
- Upper Orewa FUZ (2033-2037).

Note that these timings are from the 2017 refresh of the FULSS, in which timings differ slightly from the initial 2015 version. The residential capacity of these areas is also identified, with capacity for 4,500 dwellings in Wainui East (live zoned part), 575 dwellings in Upper Orewa (consented), 20,400 dwellings in Silverdale Wainui Dairy Flat (remainder) and 7,400 in Wainui East (remainder). Upper Orewa's capacity is included in the Wainui East capacity. The total dwelling capacity across all these areas identified in the FULSS is 32,875 dwellings.

Note that this 'development ready' timing does not imply that development will actually start at that time, and certainly not that development will be complete at that time. Instead the dates indicate when development in the area could begin. In practice it will be many years before each of the areas is fully developed, with the development rate being influenced by market attractiveness, the owners/developers' willingness to develop and underlying, regional growth trends.

Figure 3.3: FULSS future urban area sequencing



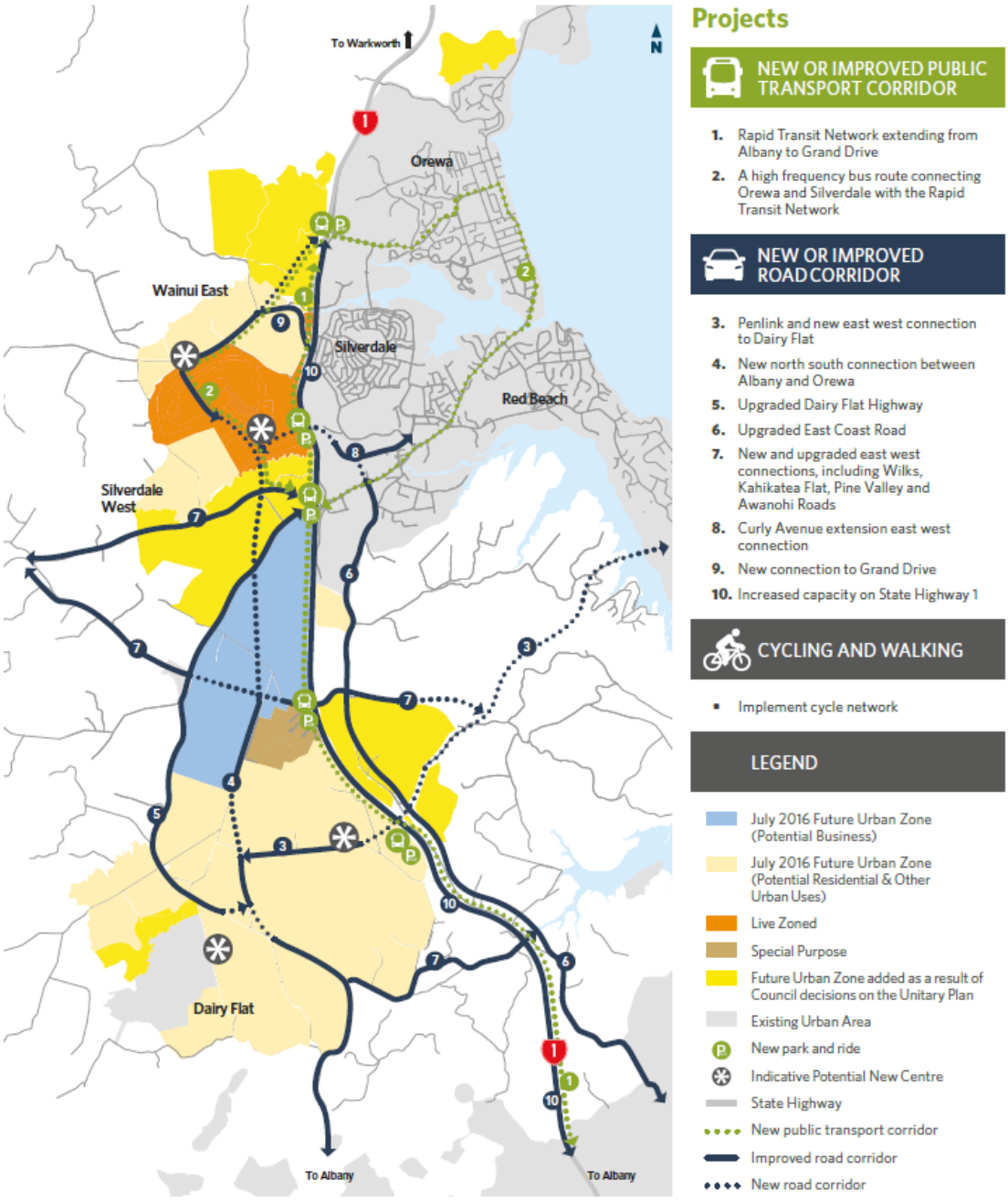
3.3 Supporting Growth project

As discussed above, the FUZ has not yet been split into different zones, other than the few small parts which were live zoned as a result of the AUP hearings, and some indications provided by the Supporting Growth project (Figure 3.4). The Supporting Growth indication is that over 600ha of the FUZ could potentially become future business land (the blue areas in Figure 3.4), although that is only an indication, and any zoning process will occur gradually and for different pieces of land, subject to the findings of reports such as this one, structure plans and finally plan changes. The Supporting Growth business land area provides some initial baseline for this assessment to report back against.

The Supporting Growth work takes into consideration high level constraints about where Business land can establish. These will need to be considered in more detail when advancing plan changes to live zone

the land, given the need for particular characteristics for Business land which usually include large, flat sites that are located close to transport links, but not located too close to sensitive receiving zones (especially residential). Those constraints will limit where Business land can be zoned, and the yield of usable Business land from the initial gross area.

Figure 3.4: Supporting Growth FUZ potential land uses[3]



[3] https://at.govt.nz/media/1973819/supporting-growth-full-brochure.pdf

3.4 NPS Urban Development Capacity

The NZ Government has produced a National Policy Statement on Urban Development Capacity (the "NPS"). That document set out certain requirements for councils, particularly in high growth areas such as Auckland, to provide evidence that they are providing adequate capacity for growth[4]. To meet its obligations under the NPS, Auckland Council commissioned Market Economics to undertake an assessment of demand and supply of business land across the region, including all centre zone types, industrial zones and other businesses zones such as the Mixed Use and General Business zones.

Market Economics completed that assessment in late 2017, and the work is now being reviewed by the Ministry of Business, Innovation and Employment, the government department with jurisdiction over NPS matters. The work completed by Market Economics assessed that in the Urban North catchment there would be demand for an additional 493,904m^2 of floorspace in industrial zones by 2048[5]. That floorspace translates into an additional 164.6ha of industrial land needed by 2048 (assuming FAR of 0.3, as described in the report).

That projection represents a single possible outcome of future land demand, and is based on a medium growth economic outlook, as required by the NPS as a minimum threshold. The projection forms part of a larger regional analysis that quantifies total regional economic growth, and distributes that growth around the region. That sub-regional allocation is driven by an assessment of suitability for development for each type of land use, using a Machine Learning Model (MLM) algorithm that takes into account vacant land capacity, existing land uses, transport network accessibility, and proximity to other similar activities.

A key characteristic of this modelling is that growth can only be allocated to a location in the NPS assessment if there is adequate zoned vacant capacity available now, and so the model does not attempt to allocate business activity to greenfields (e.g. FUZ) areas. Areas that are intended to be developed for some business activity in the future, in line with regional planning strategies, are effectively excluded from the NPS assessment. That means that the only growth in industrial activity anticipated in Silverdale and elsewhere in the Urban North is on existing zoned land. The creation of more zoned industrial land, such as might be expected in the Silverdale FUZ, would be significant as it would likely result in more regional growth being allocated to Silverdale, and less to other locations (as shown in the NPS modelling).

The Method 2 (Catchment) approach applied in this study represents an alternative land demand future, unconstrained by a lack of existing zoned land, and attempts to describe how much industrial land might be required given the perpetuation of recent historic employment and labour force trends in the Urban North.

[4] Sufficient supply to match demand in the short (0-3 years), medium (3-10 years) and long (10-30 years) term.

[5] http://www.knowledgeauckland.org.nz/publication/?mid=1781, p235 (Figure 3-8)

4 Business land demand

This section provides an assessment of the demand for business land in SWDF, and is intended to provide a high-end estimate of future land requirements which then gives greater confidence that the future land supply will meet demand. Demand assessed in this section covers the Light Industry zone (LIZ) and Heavy Industry zone (HIZ). Not included are the General Business zone, Mixed-Use zone and centres, which fall outside the scope of this work and may be addressed as the subject of a future study.

Those other zone types are more permissive to a wider range of business activity, including retail and offices. While those zones could accommodate many of the same activities as the LIZ (given the activity status of industrial activities in them) providing broad new areas of those zones would result in challenges in the way of centres planning, and maintaining the centres hierarchy and focussing particular types of activity in centres. Such zones will be provided for in other parts of the Future Urban zone and be subject to structure planning for those areas. For those reasons it will appropriate to have a much smaller area of those zones[6], and for those to be the subject of a separate study.

To recap, two scenarios are presented here:

- Method 1 (Urban North): employment and land projections are driven by projected growth in the Urban North part of Auckland (North Shore and Hibiscus Coast) from work completed for the IHP.
- Method 2 (Catchment): employment and land projections are driven by household growth in the area, and in a manner that is consistent with recent historical employment and labour force trends, unconstrained by any predetermined land availability limits. The merits of this approach are that a new industrial growth area can be created to fit with regional and sub-regional planning objectives and policies, unlike Method 1 which reflects the constraint that is created by current land zoning.

4.1 Method 1 (Urban North)

4.1.1 Business land demand

The IHP work (discussed in section 3) indicates that there will be demand for an additional 146ha of business land by 2038, and 213ha by 2048, in the Urban North area[7]. That 2048 total will be dominated by demand for LIZ land (207ha), with demand for only 6ha of HIZ. Those demands are driven by regional economic growth outlooks and projected population growth and are influenced by the current distribution of economic activity and zoned business land.

[6] Or else to include precinct overlays with restrictions as to certain types of activities, so as to, for example, limit the total quantum of retail activity that might locate in them.

[7] North Shore and the southern part of Rodney, including Orewa, Whangaparaoa and Silverdale

Figure 4.1: Urban North Business land growth over 2016 (ha)

Zone	2016	2018	2028	2038	2048
Heavy Industry	-	0.4	2.3	4.3	6.2
Light Industry	-	12.9	77.6	142.2	206.9
Total	-	13.3	79.9	146.5	213.1

4.1.2 Vacant land

Some of that projected growth will be able to establish on land that is currently vacant, or significantly under-utilised (referred to as 'vacant potential'), as described in sections 2.3 and 3.1. There is some 66ha of vacant business land in the Urban North area now that would be available for development, including 64ha of LIZ, and nearly 3ha of HIZ (Figure 4.2).

Figure 4.2: Urban North catchment vacant Business land 2018 (ha)

Zone	Vacant
Heavy Industry	2.5
Light Industry	63.8
Total	66.3

4.1.3 Silverdale Wainui Dairy Flat Additional Business land required

Given current vacant land in the Urban North, and projected demand growth, it will be some time before additional zoned land is required in the area. At a projected average annual growth rate of 6.5ha per year in the Urban North out to 2048, and current vacant business land of 66ha, further supply of LIZ land is not expected to be needed until about 2025, and over 140ha of additional LIZ land (i.e. more than what is currently zoned) would be needed by 2048, along with around 4ha of HIZ land (Figure 4.3).

Figure 4.3: Method 1: Urban North catchment demand shortfall at each time (ha, net of roads etc, includes UDS 15% buffer)

Zone	2016	2018	2028	2038	2048
Heavy Industry	-	-	-	1.8	3.7
Light Industry	-	-	13.8	78.4	143.1
Total	-	-	13.8	80.2	146.8

However, these projections are based on the assumption that existing demand patterns continue. If a large quantum of new land were to be zoned in the Urban North, such as in the SWDF, that zoning would potentially result in a redistribution of regional economic growth, making the Urban North a more attractive LIZ location. That is essentially a case of "build it and they will come" (to some extent), and would mean that the existing preferences which the IHP work is based on would change. That potential change is taken account of in the Method 2 assessment below.

The projections in Figure 4.3 are net of roads etc, and can be converted to gross numbers by applying an assumed proportion that would be occupied by roads etc. The actual net to gross yield will be influenced by topographic factors, the layout of the roading network etc., and could only accurately be determined once appropriate land is chosen, and design work is completed. The important output from this assessment is therefore the net figure, however we also present a gross estimate (Figure 4.4) by assuming that business land will occupy 72.5% of the gross area, with the balance used for road reserves etc. That 72.5% is only an approximate gross to net conversion factor, and is calculated as the mid-point of 70% and 75%, both of which numbers are often applied as an indicative gross to net conversion factor.

Figure 4.4: Method 1: Urban North catchment demand shortfall at each time (ha, approximate gross)

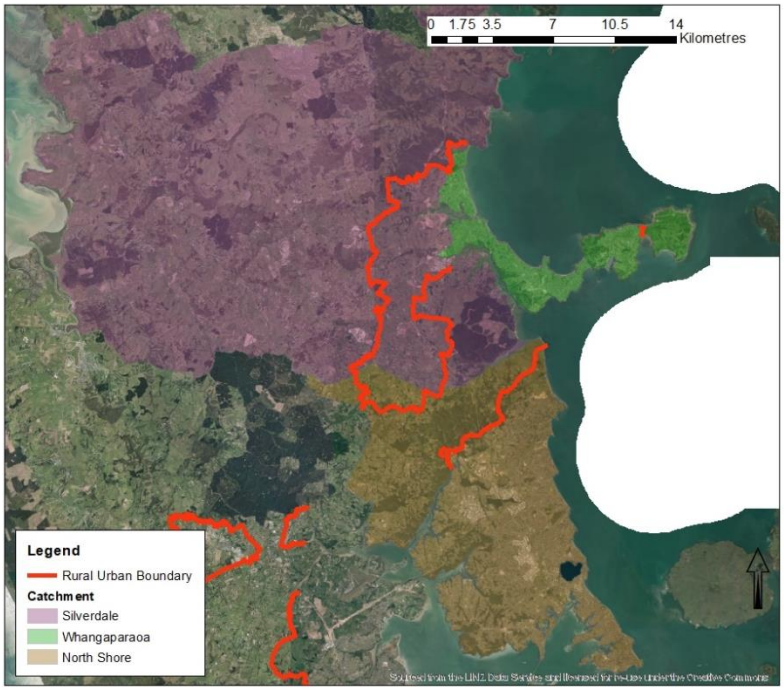
Zone	2016	2018	2028	2038	2048
Heavy Industry	-	-	-	2.4	5.1
Light Industry	-	-	19.0	108.2	197.4
Total	-	-	19.0	110.6	202.5

4.2 Method 2 (Catchment)

4.2.1 Catchment

The catchment used for Method 2 is defined with reference to how Silverdale will function as an industrial area within Auckland. The catchment was defined to include all areas between the Harbour Bridge and half way to Warkworth, and constrained by the presence of large future industrial areas in the north-west (such as Whenuapai). The catchment applied is shown in Figure 4.5.

Figure 4.5: Method 2 catchments



The North Shore subcatchment does not correspond exactly with the boundary of the former North Shore City Council, rather the boundary was defined to be roughly half way between the existing Silverdale industrial area and Albany.

4.2.2 Approach

This method differs to Method 1, as it assumes that future workforce growth will be driven by underlying population growth, whereas Method 1 assumes a particular share of total regional economic growth. The process used for Method 2 uses the following base data:

- Historic and current household counts in each subcatchment.
- Historic and current employment counts in each subcatchment, both in total across all zones and on industrial zoned (LIZ and HIZ) land specifically.
- Household projections (per section 2.6).

That data is used to:

- Assess historic employment trends, including in per household terms, and the share of all employment that has been based in industrial zones.
- Assess past trends to project forward potential future trends of employment per household and industrial share of employment.
- Project forward total future employment (by applying assumed per household employment ratios).
- Project forward future employment likely to be based in industrial zones.
- Allocate future industrial zone employment capacity across the catchment, with reference to capacity constraints.

4.2.3 Input data

Historic employment per household

Silverdale has experienced more rapid growth than Whangaparaoa and North Shore since 2000, albeit off a smaller base, and now comprises 6.3% of catchment households, up from 4.4% in 2000 (Figure 4.6).

Figure 4.6: Catchment household counts (2000-2016)

Year	Silverdale	Whangaparaoa	North Shore	Total
2000	3,750	11,640	70,690	86,080
2004	4,200	13,160	74,990	92,350
2008	4,790	14,580	78,880	98,250
2012	5,560	15,830	82,290	103,680
2016	7,110	17,360	88,480	112,950

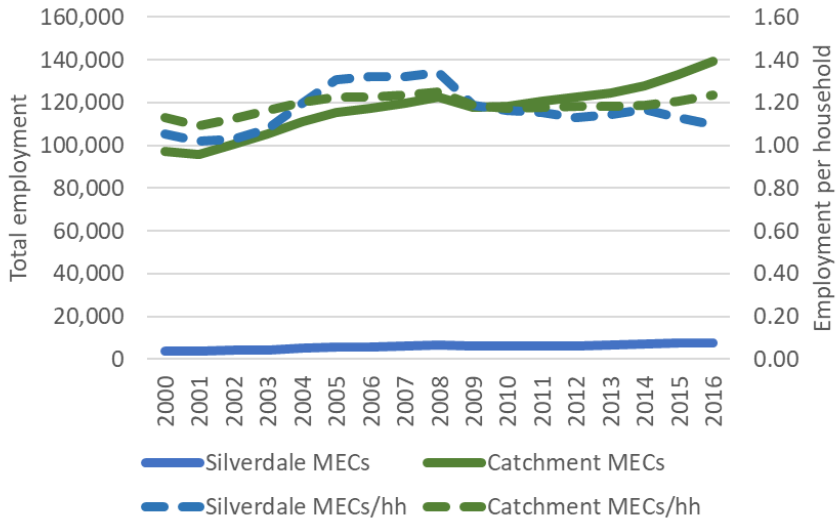
North Shore is by far the dominant subcatchment in terms of both household numbers and employment, both industrial and other. However, capacity constraints will result in Silverdale continuing to grow in relative importance. Currently Silverdale accommodates 9.3% of the catchment's employment located in industrial areas (3,040 workers, or MECs[8]), and 4.5% of other employment (4,760) (Figure 4.7). North Shore accommodates nearly 91% of industrial zone employment, and 85% of total catchment employment.

Figure 4.7: Catchment employment counts (2000-2016)

Year	Industrial Zone MECs				Non-Industrial Zone MECs				Total MECs			
	Silverdale	Whangaparaoa	North Shore	Total	Silverdale	Whangaparaoa	North Shore	Total	Silverdale	Whangaparaoa	North Shore	Total
2000	1,720	-	23,500	25,220	2,230	9,660	60,270	72,150	3,950	9,660	83,760	97,370
2004	2,040	-	29,630	31,670	2,990	10,600	65,610	79,210	5,030	10,600	95,240	110,880
2008	2,910	-	30,120	33,030	3,520	12,420	73,680	89,620	6,430	12,420	103,800	122,650
2012	2,640	-	26,530	29,170	3,630	11,540	78,100	93,270	6,270	11,540	104,640	122,450
2016	3,040	-	29,640	32,680	4,760	13,680	88,200	106,640	7,800	13,680	117,840	139,320

Combining the two datasets (households and employment) yields a description of trends in per household employment. There are now 1.23 MECs per household across the whole catchment (both industrial and non-industrial), and that figure has stayed within a range of 1.17-1.25 since 2004 (Figure 4.8). The Silverdale subcatchment has shown similar trends, although with slightly more variation, as a result of the smaller employment base there.

Figure 4.8: Historic total employment and employment per household (2000-2016)

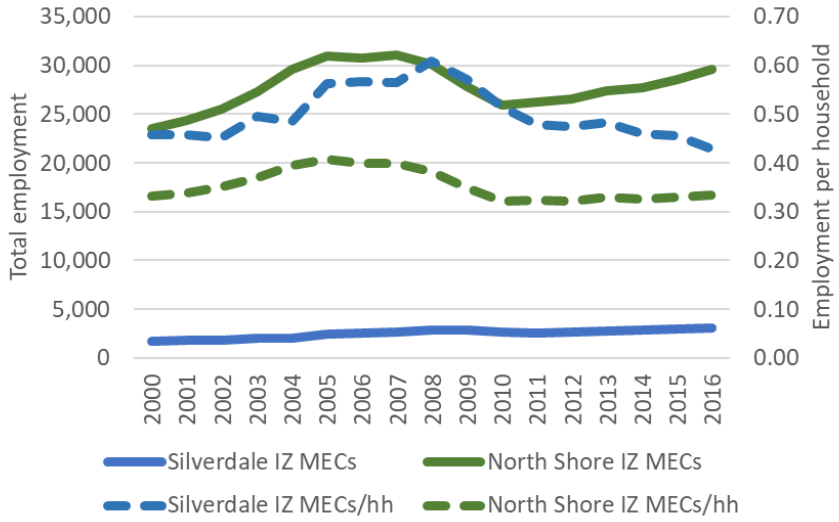


Employment in the catchment's industrial zones has also been relatively stable, although the period of stability is limited to more recent times. Although industrial zone employment per household is currently at about the same level as in 2000, in the intervening period employment per capita was somewhat higher, particularly immediately before the Global Financial Crisis (2004-2008) (Figure 4.9). The large

[8] Modified employment count, a measure of employment incorporating paid employees and working proprietors

North Shore employment base showed less volatility, and has remained at between 0.32 and 0.33 MECs employed on industrial land per household in every year between 2010 and 2016.

Figure 4.9: Historic Industrial zone employment and employment per household (2000-2016)

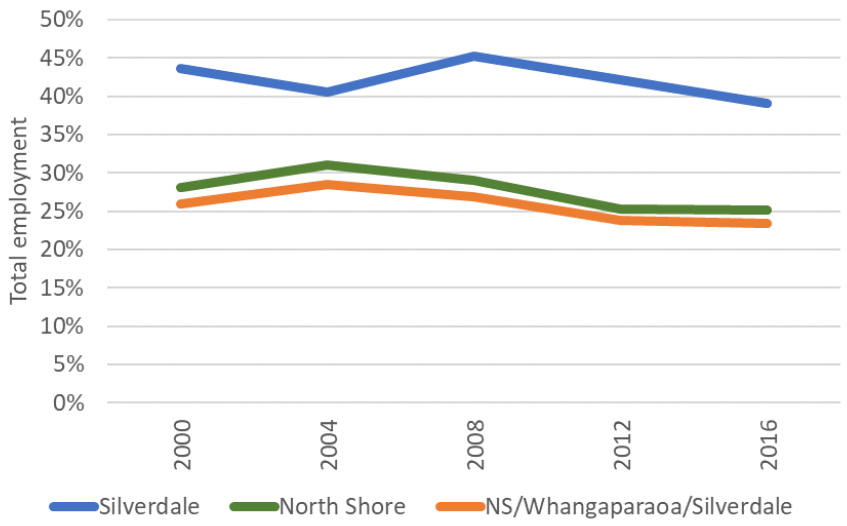


The conclusion from this assessment is that the current total employment per household (1.23) appears to be a reasonable base from which to project forward future employment numbers using household growth as the driver. Of that 1.23 MECs per household, 0.94 MECs were non-industrial MECs, and 0.29 were industrial MECs.

Industrial zone employment trends

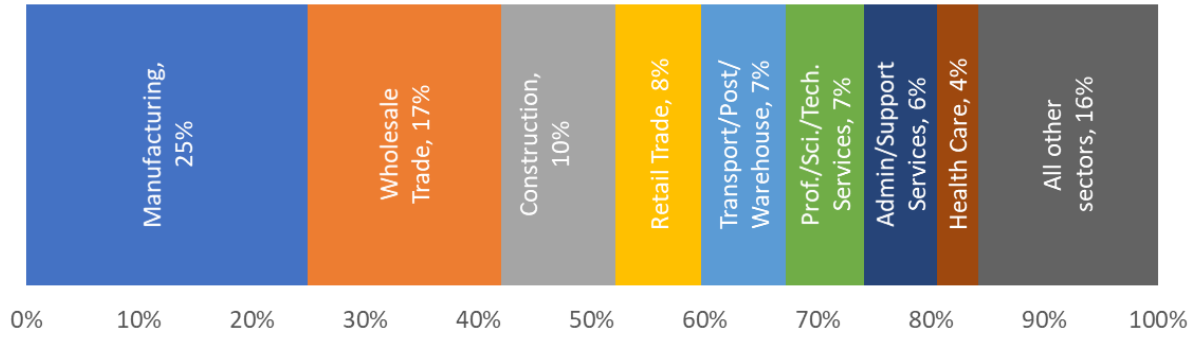
The share of employment that is located in the catchment's industrial zones has also remained relatively stable since 2000, with a slight decline in that share in both Silverdale (from 44% in 2000 to 39% in 2016) and North Shore (28% to 25%), although overall the share across the entire catchment has remained at either 23% or 24% every year since 2010, indicating a measure of stability in recent years (Figure 4.10).

Figure 4.10: Catchment Industrial Zones share of total employment



An important observation about the industrial zones, and the LIZ in particular, is that they accommodate a very wide range of activities, either because those activities are permitted, have been consented or have existing use rights. Activities in industrial zones include those commonly thought of as industrial, such as manufacturing (25% of LIZ employment in 2016) and transport businesses (7% of LIZ employment), but also other activities such as wholesaling, retail trade (particularly trade retailers and large hardware stores such as Bunnings and Mitre 10 Mega) and a wide range of service activities (Figure 4.11). Projecting forward future demand for industrial land needs to consider trends in all of these sectors (many of which have been experiencing strong growth), and not only manufacturing (where employment across all locations is declining).

Figure 4.11: Auckland LIZ employment (2016, share of MECs)



Household projections

There are currently 114,900 households resident in the three sub-catchments, with North Shore being by far the largest (90,800). Silverdale is projected to accommodate 54% of the increase in households out to 2048, on the back of 600% growth (+42,500 households). North Shore households will increase by slightly less (+33,400) in the same time (Figure 4.1).

Figure 4.12: Catchment household projections

Catchment	2016	2018	2028	2038	2048	Growth 2016-48	
						n	%
Silverdale	7,110	8,100	13,900	28,100	49,600	42,490	598%
Whangaparaoa	17,360	16,000	17,600	18,700	19,700	2,340	13%
North Shore	88,480	90,800	102,400	111,500	121,900	33,420	38%
Total	112,950	114,900	133,900	158,300	191,200	78,250	69%

4.2.4 Employment projections

From this input data the assessment then extrapolates past trends to project potential future employment. This is a reasonable approach given stability in employment per household and the share of all employment that is in industrial zones. To take into account the slight decrease in the share of all employment that is in the Silverdale industrial zone, the assessment makes allowance for that share to decrease in the future across the entire catchment, and to decrease from 23.5% now to 22.5% in 2028, and a further 1% in each of the next two decades.

Applying constant employment per household (1.23 MECs per household) forward, the current catchment workforce of 139,000 MECs would increase to 236,000 by 2048, growth of 69%, or the same rate of growth as is projected for catchment households (Figure 4.13).

Figure 4.13: Catchment employment projections (MECs, all sectors)

Catchment	2016	2018	2028	2038	2048	Growth 2016-48	
						n	%
Total	139,300	141,700	165,200	195,300	235,900	96,600	69%

That is significantly more growth than indicated by Method 1, and would result in greater growth in demand for business land. Even accounting for an assumed slight decrease in the share of that employment that is based in industrial zones, there would then be expected to be, across all three subcatchments in total, 37,200 MECs in industrial zones in 2028, 42,000 in 2038, and 48,400 in 2048 (numbers calculated in rows P, Q and R of Figure 4.14). That equates to growth of 15,700 MECs since 2016 (48%).

Our assessment of Council vacant land capacity indicates that there is a constraint to accommodating that growth in North Shore. Our detailed 2018 assessment of that data, on a parcel by parcel basis, indicates that there is only some 8.8ha of vacant land, even accounting for vacant potential land (land that is underutilised and could be more efficiently used in the future). That land might accommodate only around 320 MECs, assuming an average employment density of 36 MECs/ha. That constraint indicates that the majority of the industrial zone employment in the catchment would have to be accommodated elsewhere in the catchment, and Silverdale, as the greenfields growth area, is the natural location.

Figure 4.14: Method 2 Industrial Zone employment projections

		Silverdale	Whangaparaoa	North Shore	Total
Households					
2016	a	7,110	17,360	88,480	112,950
2028	b	13,850	17,640	102,430	133,910
2038	c	28,130	18,660	111,550	158,340
2048	d	49,640	19,730	121,910	191,280
MECs/household					
2016	e=f/a	1.10	0.79	1.33	1.23
MECs					
2016	f	7,800	13,680	117,840	139,320
2028	g=e*b	15,190	13,900	136,420	165,180
2038	h=e*c	30,860	14,700	148,570	195,310
2048	i=e*d	54,450	15,550	162,370	235,940
Share of employment in industrial zone					
2016	j				23.5%
2028	k				22.5%
2038	l				21.5%
2048	m				20.5%
Vacant employment capacity in industrial zone					
2018	n	n/a	-	320	
Employment in industrial zone					
2016	o	3,040	-	29,640	32,680
2028	p=g*k	7,210	-	29,960	37,170
2038	q=h*l	12,030	-	29,960	41,990
2048	r=i*m	18,410	-	29,960	48,370

That would mean that 15,390 (18,410-3,040 from Figure 4.14) of the 15,690 MECs growth in industrial zone employment could occur in the Silverdale subcatchment, with industrial employment in that subcatchment then reaching 18,400 MECs by 2048 (Figure 4.14). The Silverdale subcatchment is an area broader than the Silverdale Structure Plan area, however any increase in industrial employment in the subcatchment would likely need to be accommodated inside the Structure Plan area, given most of the subcatchment is outside the RUB.

Figure 4.15 provides a broad indication of how the additional employment projected for the future SWDF LIZ/HIZ land might be comprised, by sector, assuming that the future distribution of LIZ and HIZ mirrors the current distribution within all of Auckland (30.5% HIZ, 69.5% LIZ) and sectoral distribution of each industrial zone mirror the current distribution across all of Auckland. This employment distribution is very generalised, and is intended for input into Auckland Transport's Integrated Transport Assessment for the area.

Figure 4.15: Additional industrial land employment by sector

Catchment	2016	2028	2038	2048
Manufacturing	-	1,349	2,901	4,956
Wholesale Trade	-	689	1,482	2,531
Construction	-	483	1,040	1,776
Retail Trade	-	221	476	812
Transport/Post/Warehouse	-	339	730	1,247
Prof./Sci./Tech. Services	-	251	540	923
Admin/Support Services	-	209	450	769
Health Care	-	102	220	376
All other sectors	-	545	1,171	2,001
Total	-	4,190	9,010	15,390

4.2.5 Vacant land

Some of that projected growth will be able to establish on land that is currently vacant. There is currently some 66ha of vacant business land available for development in the three subcatchments together, including 64ha of LIZ and 3ha of HIZ (Figure 4.16).

Figure 4.16: Silverdale, Whangaparaoa and North Shore vacant Business land 2018 (ha)

Zone	Vacant
Heavy Industry	2.5
Light Industry	63.8
Total	66.3

4.2.6 Silverdale Wainui Dairy Flat Additional Business land required

That net growth in industrial employment in Silverdale (15,390 MECs, from the first row in Figure 4.17[9]) would then require land to operate from. Applying the same workspace and floor area ratios as for Method 1, that employment would require 115ha by 2028, 248ha by 2038, and 423ha by 2048 (Figure 4.17). Taking into account vacant land, that growth would require an additional 56ha of industrial zoned land by 2028, 209ha by 2028, and 410ha by 2048, including an allowance of 15% to adequately provide for future needs per UDS requirements. This growth is influenced by ongoing residential growth in North Shore and Whangaparaoa driving industrial growth, which is only able to be accommodated in Silverdale, so Silverdale will play a sub-regional role in accommodating growth.

Because demand under this method is linked to catchment household counts, the rate of increase of demand for business land would increase once the large areas of FUZ become development ready

[9] That number is calculated as the growth from 3,040 MECs to 18,410 MECs in rows O and R of **Error! Reference source not found.**, although differs slightly due to rounding

between 2033 and 2038. From that time, demand for additional business land (i.e. over and above current zoned supply) would increase very quickly. Those demands are net of roads etc, and can be converted to gross numbers by applying an assumed proportion that would be occupied by roads etc. A 72.5% net to gross conversion is applied here (as explained in section 4.1.3), although the rate achieved will depend on the characteristics of the land zoned.

Figure 4.17: Catchment Business land growth over 2016 (ha)

	2016	2028	2038	2048
Industrial zone employment	-	4,190	9,010	15,390
Workspace ratio (sqm/MEC)		89		
Industrial floorspace (sqm)		372,900	801,900	1,369,700
Floor area ratio (FAR)		0.32		
Land area required (ha)		115	248	423
Additional land required (net, ha)		56	209	410
Additional land required (gross, ha)		77	288	566

This additional land required might be provided as either LIZ or HIZ, as both zones accommodate a similar range of industrial activities. A main difference between the two zone types is that the range of non-industrial activities (such as retail, childcare, offices) provided for in the HIZ is more limited than it is in the LIZ. LIZ would likely be the largest component of that, although there is flexibility to accommodate that growth using either zone type. If the future distribution of LIZ and HIZ mirrors the current distribution within all of Auckland (30.5% HIZ, 69.5% LIZ), then by 2048 there would be a demand shortfall of 125ha of HIZ, and 285ha of LIZ, for a total of 410ha, Figure 4.18 (and as shown in Figure 4.17).

Figure 4.18: Method 2: Urban North catchment demand shortfall at each time (ha, net of roads etc, includes UDS 15% buffer)

Zone	2016	2018	2028	2038	2048
Heavy Industry			17.1	63.6	124.8
Light Industry			39.0	145.4	285.4
Total			56.0	209.0	410.2

Some of that demand may also be accommodated in other zones, such as the General Business Zone, although the wider range of activities provided for in those zones (the GBZ in particular) would likely result in many industrial activities finding it difficult securing space in those zones. Also, because a wide range of retail and other activities are provided for as either permitted or discretionary activities, a more widespread distribution of those zones could give rise to retail distribution effects on centres, absent any precinct overlay controls on retail floorspace limits.

The projections in Figure 4.18 are net of roads etc, and can be converted to gross numbers by applying an assumed proportion that would be occupied by roads etc. The actual net to gross yield will be influenced by topographic factors, the layout of the roading network etc., and could only accurately be determined once appropriate land is chosen, and design work is completed. The important output from this

assessment is therefore the net figure, however we also present a gross estimate (Figure 4.19) by assuming that business land will occupy 72.5% of the gross area, with the balance used for road reserves etc. That 72.5% is only an approximate gross to net conversion factor, and is calculated as the mid-point of 70% and 75%, both of which numbers are often applied as an indicative gross to net conversion factor.

Figure 4.19: Method 2: Urban North catchment demand shortfall at each time (ha, approximate gross)

Zone	2016	2018	2028	2038	2048
Heavy Industry			23.5	87.7	172.2
Light Industry			53.8	200.5	393.6
Total			77.3	288.3	565.8

4.3 Business land requirements summary

The ranges indicated by Methods 1 and 2 above are summarised in Figure 4.20. These projections show considerable variation, driven by the underlying assumptions about the drivers of growth, and the supply of land which will impact the share of regional growth that will be attracted to this northern part of Auckland. The strong effect of rapid household growth is evident in the upper end of the ranges given, and it is likely, given the imminent exhaustion of LIZ supply in the North Shore, that the focus for future LIZ growth in the Urban North will become the SWDF area, because it is the next nearest LIZ location to urban Auckland. A similar pattern is expected to be repeated in other parts of Auckland, as the FUZ in Whenuapai attracts industrial activity in the north-west, and Drury attracts same in the south. The broad range for HIZ is because Method 2 (the higher HIZ figure) assumes the current total Auckland LIZ/HIZ split will apply to future SWDF industrial land. Method 1 is driven by regional economic growth outlooks and are strongly influenced by the current distribution of economic activity and zoned business land. In essence then, Method 2 assesses the LIZ/HIZ split in a way that is unconstrained by current zoned business land, and assumes the Council have the flexibility to zone FUZ land in any split without being constrained by the mix of current zoned land in the area, which should not constrain how the LIZ/HIZ split is applied.

Figure 4.20: SWDF business land requirements (ha), net of roads etc, and including 15% NPS buffer

Zone	2028	2038	2048
Heavy Industry	0 - 17	2 - 64	4 - 125
Light Industry	14 - 39	78 - 145	143 - 285
Total	14 -56	80 - 209	147 - 410

4.4 Net additional land including non-industrial activities

Total business land required in SWDF will be comprised of land to provide for light and heavy industry, including some allowance for non-industrial activities to support the retail and other business needs of

the local workforce. Those supporting activities might be expected to occupy some 13ha of the LIZ in SWDF, made up predominantly of automotive-based[10] businesses (11ha), with some small allowance for takeaway food outlets and some limited types of retail, such as are permitted activities in the zone (e.g. trade retailers) (Figure 4.21). Together with the 147-410ha of land required for core business land activities, up to 424ha of industrial zoned land would be required in SWDF by 2048. That is likely to be dominated by LIZ, although there is the potential for a significant proportion of HIZ as well.

Figure 4.21: SWDF total net additional Business land required to 2048 (net ha, excludes roads etc.)

Zone	Retail and services	Business land	Range indicated	Upper end
Heavy Industry	0	4 - 125	4 - 125	125
Light Industry	13	143 - 285	156 - 299	299
Total	13	147 - 410	160 - 424	424

[10] Classified as a quasi-retail activity in the underlying model, and so not included in the LIZ total otherwise

5 Conclusion

Silverdale Wainui Dairy Flat will become one of Auckland's key growth nodes in the next three decades, and that growth will require significant new provision of retail and services space and business land to accommodate employment and meet the future needs of the community.

There are currently 7,100 households resident in the Silverdale subcatchment, and this is projected to increase to nearly 50,000 households by 2048. That equates to average annual growth of between 1,330 households out to 2048. Of that catchment growth, between 74% is expected to be in the FUZ area, and most of that (45% of total growth) will be in the southern part of FUZ. That large southern part of the FUZ will require a significant new retail and business land presence to accommodate the needs of the residential population. There will also be additional growth in neighbouring subcatchments at Whangaparaoa and North Shore, which will also support additional economic growth.

Demand for Business Land (LIZ and HIZ)

There will be demand for a significant amount of new business land given both projected population growth and SWDF's proximity to North Shore, where vacant land is very limited. By 2048 this demand will amount to between 160 and 427ha of LIZ and HIZ (net of roads). That range shows considerable variation, due to the underlying assumptions about the supply of business land in the FUZ, businesses' location preferences, regional economic growth and household employment generation.

The SWDF is likely to become the focus for future LIZ growth in the Urban North due to the imminent exhaustion of LIZ supply in the North Shore, because it is the next nearest LIZ location to urban Auckland. The lower end industrial land projection (Method 1) represents a minimum point to meet the requirements of the NPS. This result does not represent a preferred or best outcome. It merely indicates the demand in a medium growth future and does not allow for any future changes in supply which are enabled by the FUZ, and instead assumes no zoning changes.

However, if new zoned land is created through a conversion of FUZ into other zones, the distribution of economic growth in Auckland would be expected to change in response. Method 2 is a scenario in which the potential quantum of demand that might result from the quantum of development projected in the FUZ is taken into account, and provides higher estimates of industrial land demand. Because it is inevitable that there will be a conversion of FUZ land into land for other uses, future demand will likely be nearer the upper end of the range presented than the lower end, although demand may not quite reach the upper end of the range. Also, because there might tend to be a move towards higher density development over time, as Aucklanders become more accustomed to higher density living, the ultimate household yield from the area may be higher than is currently expected. If that eventuates, the current dwelling yield, and the employment and industrial land demand that it drives, could well be understated in Method 2 of this assessment. Although the upper end estimates are based on extrapolated recent trends of household employment generation and industrial sector growth patterns, these might not be sustained, given the proximity to North Shore, and especially Albany, which will accommodate a large workforce, especially in commercial activities.

That upper end, however, better reflects the potential for changed locational preferences for business land (especially LIZ) within Auckland, as driven by a substantial new area of LIZ land in SWDF, with all the benefits that could offer to new businesses (cheaper land than in North Shore and Auckland isthmus, agglomeration economies, co-location with other similar businesses, shared infrastructure etc.), and so should be preferred to the lower end estimates.

In any case it would be prudent to plan to accommodate near the high end of that range given the difficulties with finding more industrial land once other activities are in place. For example, were some part of the FUZ to be zoned for a higher value land use (such as residential or local centre), it is highly unlikely that the land would ever revert to a lower value land use (such as industrial, or rural). The fact that many zones would create higher value land than industrial would indicates there is likely to be some opposition to the creation of industrial zones in many areas, especially of sufficient size to accommodate long term (30 years, per the NPS) growth. In the event of the higher growth in industrial land demand (such as outlined in Method 2) it may be difficult to rezone sufficient land from a post-FUZ, but non-industrial zone.

Land required for all purposes

Some centres-type activities will naturally locate on business (e.g. LIZ) land, to supply the needs of the local workforce there, and because some of those activities will be either permitted in the business zones or more suited there. In total up to 427ha of additional business land might be required in the SWDF area, and that could be accommodated as any combination of LIZ and HIZ, although historically there has been much more LIZ-type (and its predecessors) of land than HIZ, with a likely strong dominance of the former.

That quantum of land is relatively similar to the indication from the Supporting Growth study, which was 600ha gross. Projecting demand for business land in a high growth area such as this, close to a large established urban area, and when a large change from current economic structures is indicated (i.e. a likely move of industry to the north) is challenging, however the ranges presented provide a solid indication that a very significant amount for new centres and other business land will be required in Silverdale Wainui Dairy Flat in the future.