



Stantec

**CITY OF WINDSOR ANNEXED AREA
MASTER PLAN STUDY**

**UPDATED LAND NEEDS
REQUIREMENTS**

DRAFT

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6.0 Land Needs Requirements

6.1 INTRODUCTION

The Land Needs Requirements component of the Annexed Area Master Planning Study is necessary to address provincial policies pertaining to the provision of land for future growth. It will determine the extent of the annexed land that is required to accommodate the twenty-year housing and employment projections and identify if there is a need for an urban growth boundary within the annexed area. Specific objectives of the Land Needs Requirements Study are as follows:

- Determine the amount of land required for general land use categories as a basis for recommending Official Plan designations;
- Identify if there is a need for any unique or specialized land requirements that must be considered given Windsor's location and economic context;
- Utilize appropriate methods for determining land needs requirements and, where possible, compare the results using alternative methods to provide cross validation of assumptions and projections;
- Consider applicable provincial and municipal policies and directions related to efficient use of land and services;
- Ensure that adequate land is provided to allow for a range of housing and employment opportunities during the planning period.

6.2 METHODOLOGY

Population, housing and employment projections provide the foundation for determining land needs requirements. Sections 2, 3 and 4 of the Annexed Lands Master Planning Study have calculated future population growth and associated housing demand and employment scenarios. Tasks undertaken in this section of the report include the following:

- Identify applicable density assumptions and/or targets for residential and employment uses;
- Determine the extent and availability of vacant lands for general land use categories;
- Obtain and incorporate recent building / approval data to update census information, where possible;

- Consider the potential impact of recent trends / events on projected land needs requirements.

An extensive amount of information was provided by the City of Windsor Planning Services Unit regarding building activity, zoning categories, existing land use proportions, vacant land information, etc. based on GIS mapping, census data, development applications / approvals and previous analysis and studies. Additional information, particularly with respect to employment land needs, was obtained from the Windsor-Essex County Development Commission.

More detailed description and methodology for individual components of the Land Needs Requirements analysis is provided in the following sub-sections of this report.

6.3 RESIDENTIAL LAND REQUIREMENTS

The projected housing demand required to accommodate the future population was described in Section 3 of this Study. Based on the 'medium growth' population projection, combined with headship rates and household propensity data provided by Statistics Canada, total housing demand is projected to be 109,200 dwelling units by the end of the planning period in 2026, as summarized below in Table 6.1. Future housing demand is expected to continue to be dominated by single family detached dwellings, based on current household demand propensities which are not expected to experience substantial change

Table 6.1
HOUSING DEMAND PROJECTION SUMMARY

Year	Single detached -	Semi-detached	Row house	Detached duplex / Apt.	Apartment < 5 storeys	Apartment (5 storeys)	Projected Total
2001	52,590	3,335	4,485	3,255	11,820	8,290	83,775
2006	56,481	3,546	4,766	3,399	12,428	8,624	89,244
2011	60,061	3,724	4,994	3,521	13,038	8,920	94,258
2016	63,336	3,877	5,259	3,666	13,813	9,267	99,219
2021	66,612	4,030	5,469	3,812	14,743	9,621	104,287
2026	69,784	4,167	5,638	3,935	15,759	9,913	109,200
2026 (%)	64%	4%	5%	4%	14%	9%	

Source – Statistics Canada 2003, City of Windsor



However, given provincial policies promoting increased levels of infill and intensification to achieve more compact urban form, scenarios should also be

explored that consider a reduced proportion of single family / low density residential development to identify a potential range for residential land needs requirements. The foregoing table indicates that approximately 68% of future accommodation will be low density in the form of single or semi-detached dwellings, with only 9% being rowhouses and duplexes (typically considered as more of a medium density form of housing). However, with smaller households and an aging population, there may be an increased need or interest in medium density forms of development such as rowhousing, stacked townhouses and duplexes that could better accommodate the needs of seniors or facilitate the housing of multiple generations under one roof. Alternative residential land needs scenarios will be presented later in the report.

To convert the total housing demand projections into residential land area requirements, the following factors must be taken into consideration:

- Availability of existing housing stock;
- Vacancy rates;
- Infill and intensification opportunities;
- 'Holding capacity' of existing residentially designated lands;
- Density and housing mix assumptions / expectations.

6.3.1 Vacancy Rates

Vacancy rates are considered in the determination of residential land requirements because it is not reasonable to assume that all available housing will be occupied at all times. Information obtained from CMHC reveals that vacancy rates for apartments have fluctuated from a low of 1.9% in 2000 to a high of 10.3% in 2005. High vacancy rates in the previous two years have been attributed to a number of factors, including a shift to homeownership, volatile employment rates for the 15-24 year old age group, and lack of substantial job growth. However, CMHC expects vacancy rates to tighten in 2006 and does not foresee a long-term trend for excessively high vacancy rates.

Table 6.2 provides a summary of vacancy rate trends since 1996. These rates include apartments containing three or more units. Vacancy rates for other forms of housing (i.e. – single detached, semi-detached, etc.) are not available, but are assumed to be approximately 5% based on a comparison of occupied versus total dwelling unit data available from Statistics Canada in 2001. For the purposes of determining residential land requirements, a vacancy rate of 3.5% is assumed. While lower than the 10 year average, it takes into consideration that the previous 2 years have been anomalies over this time period. In addition, CMHC analysts indicate that the vacancy rate is expected to “tighten up” again in the future and have previously

indicated that a reasonably healthy vacancy rate for cities such as Windsor is in the 3 to 3.5% range.

Table 6.2
VACANCY RATES (%)

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Average
Apartment / Row House	2.8	4.5	4.3	2.7	1.9	2.8	3.9	4.3	8.8	10.3	4.6

Source: CMHC, Rental Market Reports, 2001 to 2005.

When the future housing demand projections are adjusted to account for an assumed vacancy rate of 3.5%, the revised total housing demand at the end of the planning period is expected to be just over 113,000 units as shown in Table 6.3.

Table 6.3
HOUSING DEMAND AS ADJUSTED FOR VACANCY RATES

	Total Projected Need (2026)	Total Demand as Adjusted for Vacancy Rate
Single Detached	69,784	72,226
Semi-detached	4,167	4,313
Rowhouse	5,638	5,835
Apartment/detached duplex	3,935	4,073
Apartment < 5 storeys	15,759	16,311
Apartment ≥ 5 storeys	9,913	10,260
TOTAL	109,200	113,018

6.3.2 Existing Housing Supply

To further refine the housing demand prior to determining land requirements for residential use, projected demand as adjusted for vacancy rates is compared to the current stock of housing in the City of Windsor. Data regarding existing housing stock, as shown in Table 6.4, was provided by the City of Windsor Planning Department based on information compiled from Statistics Canada data. This indicated that there is a total of approximately 88,533 occupied and unoccupied dwellings in Windsor. However, a breakdown by dwelling type is available only for occupied units. It has therefore been assumed that the proportion of total dwellings units by type is generally consistent with the proportions of occupied dwelling units.

The housing figures provided in Table 6.4 also include additional dwelling units that have been constructed since the 2001 census, based on building permit data. As a result of these adjustments, a net housing demand of approximately 19,423 additional units is projected to be required over the twenty year planning period.

Table 6.4
NET HOUSING DEMAND

	Total Projected Housing Demand (2026)	Existing (2001) Housing Stock *	2002-05 Additions to Stock	Net Housing Demand
Single Detached	72,226	55,193	3,133	13,900
Semi-detached	4,313	3,604	548	161
Rowhouse	5,835	4,738	636	461
Detached Duplex / Apt.	4,073	3,514	182	377
Apartments	26,571	21,484	563	4,523
TOTAL	113,018	88,533	5,062	19,423

Source: Statistics Canada, City of Windsor Infrastructure Services Building Unit (2002 – 2005 Building Permit Statistics)

Note – Numbers may not calculate exactly due to rounding.

6.3.3 Intensification and Infill

In addition to the previous adjustments for existing housing stock and recently constructed units, it is expected that a certain proportion of the total housing demand will be met through infill and intensification. Allowances for infill and intensification are also consistent with smart growth initiatives promoted by the Province and the Municipality. The extent of housing demand that can be met by infill and intensification is difficult to predict as it is affected by various factors including market demand, land costs / availability and development economics.

Of the nineteen Planning Districts in Windsor, fourteen are primarily built-out with little vacant land available for infill development. Detailed information provided by the City of Windsor in July 2006 regarding vacant lands indicates that there are approximately 93 hectares of vacant land available in these areas. Zoning on these lands permits a range of development from single family to apartment buildings. Some intensification opportunities may also exist in older areas of the City where underutilized parcels of land exist or where redevelopment to higher density residential uses may occur in the future.



To help determine recent trends and assumptions relating to infill and intensification, information provided by the City of Windsor Planning Services Unit and Building

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Department was reviewed to determine the extent of building permit activity in recent years for those Planning Districts that are primarily built out. Data provided in 2003 included units added to existing dwellings as well as new dwelling units. Based on this review, it was estimated that infill and intensification accounted for approximately 14% of the total dwelling units constructed between 1996 and 2001, as shown in Table 6.5.

Table 6.5
INFILL AND INTENSIFICATION ACTIVITY – 1996 TO 2001

Type of Residential Building Activity	Intensification / Infill Units	Total Units Constructed**	Approximate % Allocated to Infill / Intensification
Multi-family Residential*	686	2,273	30%
Single family Residential	143	4,383	3.3%
Additional Dwelling Units in Existing Buildings	150	150	100%
TOTAL	979	6,806	14.4%

* Includes semi-detached, duplex, double duplex, rowhousing and apartments.

** Source – City of Windsor Infrastructure Services Building Unit (1998 – 2002 Building Reports)

Although no detailed breakdown was available for the split between apartments and rowhousing or other multi-family dwellings such as semi-detached or duplex units between 1996 to 2001, City of Windsor Planning staff advised that the majority of ‘multi-family residential’ infill development that occurred during that time frame consisted of apartment / condominium units and estimated that up to 75% of all new apartments were created through infill / intensification. City staff also indicated that rowhousing units created between 1996 and 2001 occurred primarily in high growth (i.e. – greenfield) areas rather than through infill and intensification of built-up areas.

More detailed information provided by the City of Windsor in 2006 regarding active or approved development from 2003-2005 revealed a slightly higher proportion of infill and intensification occurring or proposed in this time frame than from 1996-2001, as shown in Table 6.6. This was attributed in part to the lack of ‘uncommitted’ residential land available for residential development in Windsor. However, it is clear that the majority of infill/intensification development continues to be apartment units. Rowhousing also continued to be developed primarily in greenfield / developing areas.

Table 6.6
INFILL AND INTENSIFICATION ACTIVITY – 2003 TO 2005

Location	Single Detached Units	Semi-Detached Units	Row Units	Apartment Units	Total Units
Greenfield Areas	1,869	718	855	123	3,565
Built-up Areas	153	8	199	348	708
TOTAL	2,022	726	1,054	471	4,273
% Greenfield	92.4%	98.9%	81.1%	26.1%	83.4%
% Built-up	7.6%	1.1%	18.9%	73.9%	16.6%

Note: Figures reflect approved consent, subdivision, condominium and part-lot control applications and approvals from 2003-2005 where new units were created plus proposed units currently under consideration, based on information provided by the City of Windsor Planning Services Division.

6.3.4 Vacant Land Analysis

The City of Windsor provided detailed data in July 2006 for vacant land available within the City. This included location, area, zoning and Official Plan land use designations in association with GIS coordinates. The data included vacant lots within built-up areas, un-built lots / blocks within registered subdivision plans and larger undeveloped parcels of land that are yet to proceed through the subdivision process. Stantec then undertook further analysis of the data to determine the potential residential yield that could be realized from these areas. A detailed description of the assumptions used in estimating development potential is provided in Appendix A. Our analysis also distinguished between areas which are still being developed (i.e. – ‘greenfield’ areas) from those that are generally built-out.

The detailed review of vacant land availability indicated that there are approximately 500 hectares of residentially designated and zoned land available at the present time in the City of Windsor. Of this, less than 100 hectares is within the ‘built up’ area, with approximately 405 hectares in five greenfield / developing areas. Within the built up area, the land parcels are generally very dispersed and consist of small remnant parcels that would primarily be considered as infill opportunities as described in Section 6.3.3. Shaded cells identify ‘greenfield’ planning districts that still contain larger tracts of undeveloped land or draft approved, but as yet undeveloped areas. A summary of the existing residential vacant land inventory and its potential development capacity is provided in Table 6.7, indicating that there is capacity for approximately 11,465 units overall, based on existing zoning and associated density assumptions.

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Table 6.7

ESTIMATED DEVELOPMENT CAPACITY OF EXISTING VACANT RESIDENTIAL LAND

Planning District	Vacant Residential Land (ha)	Estimated Total Development Potential (units)	Low Density	Medium Density	High Density
'Greenfield' / Developing Areas					
East Riverside	51.88	1,255	636	619	0
Malden	131.12	2,295	2,249	47	0
Roseland	67.34	1,197	850	58	288
South Cameron	102.09	1,942	1,575	286	81
South Windsor	52.96	884	884	0	0
TOTAL (GREENFIELD)	405.39	7,572	6,194	1,010	368
'Built-up / Infill Areas'					
Annexed	13.62	164	164	0	0
City Centre	2.39	59	20	39	0
Devonshire	1.93	40	28	12	0
East Windsor	8.96	530	79	24	427
Forest Glade	14.40	899	55	20	824
Fountainbleu	10.93	205	159	47	0
Ojibway	0	0	0	0	0
Remington Park	6.56	135	125	10	0
Riverside	8.20	404	175	23	206
Sandwich	8.78	139	70	69	0
South Central	3.06	65	28	38	0
South Walkerville	1.52	16	14	2	0
University	8.16	322	41	72	209
Walker Farm	0	0	0	0	0
Walkerville	4.81	208	53	61	94
TOTAL (BUILT-UP)	93	3,186	1,008	417	1,761
GRAND TOTAL	498.74	10,758	7,202	1,427	2,130
Proportion of Total			67%	13%	20%

* Shading identifies 'greenfield'/ developing Planning Districts



It is important to note that the potential yield from 'true' vacant lands is a general approximation that assumes the lands will be developed at the mid to upper limits of

the densities that are permitted by the zoning by-law, where they are defined. It is fully acknowledged that these vacant lands could potentially be developed for single-family detached dwellings instead, or that the housing form and mix could change based on market conditions, amendments to the zoning by-laws and other factors related to development and redevelopment. However, the estimate is intended to provide a reasonable approximation of the development capacity of those lands that were identified as vacant.

Based on the residential development potential for the built-up areas of Windsor, as outlined above, it is estimated that the following proportions of housing demand could be achieved through the infill and intensification of those lands given the existing zoning:

- Low density (single family, semi-detached) – 7%
- Medium density (row housing and duplexes) – 50%
- Apartments – 40%.

These figures equate to approximately 16% of the total housing demand, which is similar to levels that have occurred in recent years. Resulting housing need requirements after taking these infill and intensification estimates into account are shown in Table 6.8.

Table 6.8
HOUSING NEED AS ADJUSTED FOR INTENSIFICATION AND INFILL CAPACITY

	Net Housing Demand*	Infill / Intensification Capacity	Remaining Housing Need	% Met by Infill/Intensification
Low Density	14,061	1,008	13,053	7%
Medium Density	838	417	421	50%
High Density	4,523	1761	2,762	39%
TOTAL	19,423	3,186	16,236	

* As adjusted for vacancy rates and building activity since 2001

It is also reasonable to assume that there is the opportunity for additional intensification to occur through redevelopment of underutilized sites in the existing built-up areas. However, it is unlikely that a significant amount of redevelopment would be low density (single and semi-detached) given the location and size of vacant land parcels. Some opportunities may exist on brownfield sites or other underutilized or 'reclaimed' sites such as old school sites, etc. But it is anticipated that the majority of future infill, intensification and redevelopment in built up areas will

be medium and higher density forms. Consequently, for the purposes of determining residential land needs, it will be assumed that at least 20% of the housing needs (as adjusted for vacancy rates and previous construction) could be met through infill and intensification, broken down as follows: low density - 7%, medium density – 50%, high density – 65% as shown below in Table 6.9. The assumption of increased levels of intensification is also intended to address provincial policies promoting smart growth and compact form. It is likely that more specific intensification and redevelopment targets will be defined for the City of Windsor during the Official Plan five-year review process. If that occurs, the land needs requirements for the annexed lands can be further adjusted if necessary to reflect revised intensification and redevelopment targets.

Table 6.9

HOUSING NEED AS ADJUSTED FOR REVISED INTENSIFICATION ASSUMPTIONS

	Net Housing Demand*	Infill / Intensification Assumption	Demand to be Met by Infill /Intensification in Built-up Areas
Low Density	14,061	7%	984
Medium Density	838	50%	419
High Density	4,523	65%	2,940
TOTAL	19,423		4,344

* As adjusted for vacancy rates and building activity since 2001

Density assumptions for vacant lands remaining in the five greenfield / developing areas may also be slightly higher than previous development that has occurred, as well as assuming maximum densities for any parcels with zoning for apartments. However, this allows for an increased level of intensification as the remaining greenfield areas are developed. Overall, the proportion of net housing demand that is expected to be accommodated within the former City of Windsor boundaries is approximately 61% based on the foregoing assumptions and analysis.

6.3.5 Demolition and Conversion

Information obtained from the City of Windsor Building Division indicates that there was an average of 100 demolition permits issued in recent years. This represents approximately 0.1% of the total housing stock, if all permits were issued for residential dwellings. As this is a very small percentage, the impact of demolition and replacement is considered to be negligible on the overall housing stock availability and no adjustments have been included to accommodate this factor.

6.3.6 Density Assumptions for Future Development

A review of residential development conducted by the City of Windsor in 2003 regarding recent development activity indicated that typical gross densities for various types of housing in greenfield situations were as shown in Table 6.9. These gross densities include local / collector roads as well as schools and neighbourhood parks. The overall proportion of land frequently assumed to be required by these non-residential uses is approximately 35% (25% roads, 10% parks / open space and schools). Based on this assumption, the net density equivalent for these forms of housing is also shown below.

Table 6.10
DENSITY COMPARISON FOR RECENT DEVELOPMENT ACTIVITY

Housing Form	Estimated Gross Density (Units/ha)	Estimated Net Density (Units/ha)
Single family detached	10	15
Semi-detached	17	26
Duplex	20	31
Row Housing	34	52
Low Rise Apartments	55	85
Medium/High rise Apartments	100	154

Source: City of Windsor Planning Division, 2003

In recognition of provincial and municipal policies that promote smart growth and compact urban form, it is anticipated that future residential development will be denser than in the past. As a result, for the purposes of determining residential land needs requirements for the annexed lands, the following gross densities will be used:

- Low density residential – 13 units/hectare (approx. 20 uph net)
- Medium density residential – 30 units/hectare (approx. 45 uph net)
- High density residential – 100 units/hectare (approx. 150 uph net)

Although these density figures may be slightly higher than previous development that has occurred in Windsor, they are intended to reflect industry wide development trends and the increasing market demand for smaller lots that is occurring in many municipalities, as well as respond to provincial policies for more compact growth.

6.3.7 Residential Land Requirements Summary

The total land area required after taking into consideration vacancy rates, infill and intensification assumptions and the potential yield from vacant developing lands within the former City boundaries is calculated to be approximately 542 hectares as shown in Table 6.11.

The majority of the overall land area consists of lands required for low density (i.e. – single family, semi-detached) development. Sufficient vacant lands, already zoned to permit a range of medium density development, is available within the former City boundaries to accommodate all of the predicted future housing demand for row housing and duplex forms of development, as well as approximately half of the demand for high density / apartment development. However, as the existing zoning generally permits single family detached dwellings in addition to various forms of multiple / higher density housing, it is impossible to predict what type of dwellings will ultimately be constructed in these areas. If single family development is constructed in areas where multi-family development is assumed, the additional land requirements for single family development would be reduced. However, this would be offset to some extent by a corresponding need for other land to accommodate medium and high density residential development during the planning period.

It is also important to ensure that a full range of housing types and densities can be provided within individual communities and neighbourhoods to allow future residents some choice in location, tenure, affordability, etc. The land needs requirements calculated above have not incorporated any land area for medium density residential uses because there is sufficient land available in the former City boundaries to accommodate the entire need according to the vacant land inventory and existing zoning. However, this would result in communities comprised of 85% low density and 15% high density. Consequently, it is recommended that a contingency factor of approximately 10% be applied to the overall residential land needs requirements in order to allow for such uses and provide sufficient land to accommodate a full range of housing choices and to make some allowances should actual densities not achieve those assumed for the purposes of calculating the residential land requirements.

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Table 6.11

TOTAL RESIDENTIAL LAND NEEDS REQUIREMENTS

	Total Housing Demand*	New Housing Demand*	Demand to be Met by Infill & Intensification	Vacant Residential Land Capacity (Greenfield)	Net Housing Need	Assumed Gross Density	Land Area Requirements (ha)	
Low Density	76,539	14,061	984	6,194	6,883	13	529	
Medium Density	9,908	838	419	1,010	0	30	0	
Apartments	26,571	4,523	2,940	368	2,215	100	12	
TOTAL	113,018	19,423	4,344	7,572	8,098		542	
Recommended Contingency Factor to Accommodate a Full Range of Housing (10%)								55
TOTAL RESIDENTIAL LAND REQUIREMENTS								597

* Note – As adjusted for vacancy rates, existing housing stock and building construction since 2001

6.3.8 Alternative Scenarios

Two alternative residential land use scenarios have also been developed for comparison purposes. One scenario estimates residential land needs if future housing development continued to occur at similar densities and housing mix as has been constructed over the past 10 years, as well as similar levels of infill and intensification. This is viewed as the 'business as usual' scenario. Based on this scenario, there would be a need for approximately 739 hectares of additional land, as shown in Table 6.12.

Table 6.12

RESIDENTIAL LAND NEEDS REQUIREMENTS – 'BUSINESS AS USUAL' SCENARIO

	Housing Mix	New Housing Demand*	Intensification Assumption	Demand Met by Infill	Vacant Land Capacity (Greenfield)	Net Housing Need	Assumed Gross Density	Land Area Requirements (ha)
Low Density	76%	14,061	5%	738	6,194	7,830	11	712
Medium Density	12%	2,331	25%	583	1,010	738	30	25
Apartments	12%	2,331	75%	1,748	368	214	75	3
TOTAL		19,423		3,069	7,572	8,782		739



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The second scenario identifies the residential lands required if considerably more compact urban form was achieved by a housing mix that contained a lower proportion of low density development, an intensification target of approximately 30%, and higher densities for the various forms of housing, in response to Provincial policies pertaining to compact and efficient growth. In the GTA and Greater Golden Horseshoe Area (GGH), infill and intensification targets of 40% have been established for primary urban settlement areas by the year 2015 and for each year thereafter. While it may be more difficult for Windsor to achieve those levels of infill and intensification, it is likely that intensification and redevelopment could accommodate an increased share of medium and high density housing over time. The 'compact scenario' assumes intensification targets of 7% for low density, 60% for medium density and 75% for high density resulting in an overall target of just over 30%. The results of this scenario, shown in Table 6.13, indicate that a total land area of approximately 329 hectares would be required to accommodate future housing needs, as a result of the revised housing mix and higher density assumptions for single family housing.

Table 6.13

RESIDENTIAL LAND NEEDS REQUIREMENTS – COMPACT SCENARIO

	Housing Mix	New Housing Demand*	Intensification Assumption	Demand Met by Infill	Vacant Land Capacity (Greenfield)	Net Housing Need	Assumed Gross Density	Land Area Requirements (ha)
Low Density	60%	11,654	7%	816	6,194	4,644	15	310
Medium Density	20%	3,885	60%	2,331	1,010	544	35	16
Apartments	20%	3,885	75%	2,913	368	603	150	4
TOTAL		19,423		6,060	7,572	5,791		329

The results of these alternative scenarios suggest that the land area required to accommodate future demand is likely to range from 330 to 740 hectares. It is unlikely that the densities assumed in the compact scenario would be attained in the foreseeable future, as it would require a considerable shift in market demand, as well as a doubling of the level of infill and redevelopment that has occurred in recent years. However, it is reasonable to expect that future development in the annexed lands can and should be more compact than has occurred in previous years. As a result, it is recommended that approximately 550 to 600 hectares of land be identified for future residential development over the twenty-year planning period. This should provide sufficient lands to meet the projected housing demand while recognizing the need to attain higher levels of intensification. Should intensification targets not be reached and/or built densities be lower than assumed, opportunities to address

potential shortfalls in available residential land would occur during the various Official Plan five year review processes.

6.4 INDUSTRIAL LAND REQUIREMENTS

Section 4 of this study provided detailed employment growth projections for the City of Windsor as the basis for determining land needs requirements for industrial, commercial and related uses. The medium growth employment scenario was identified as the most appropriate for the twenty year planning period, given available data and longer term economic trends and will be used as the reference scenario for further analysis and calculation of land needs requirements. For reference purposes, Table 6.14 summarizes the projected ‘additional employment’ for the medium case scenario, after adjustments for intensification, downtown office workers, and categorization of employment jobs as previously determined by the Employment Projections component of this Study.

Table 6.14

SUMMARY OF ADJUSTED PROJECTIONS BY TYPE OF EMPLOYMENT (2026)

EMPLOYMENT CATEGORY	MEDIUM
Primary Jobs	179
Employment Land Jobs - Heavy	2,990
Employment Land Jobs - Light	8,969
Population Jobs	14,023
TOTAL ADDITIONAL EMPLOYMENT REQUIRING LAND	26,162

Additional steps needed to convert the employment projections into land area requirements are as follows:

- Determination of appropriate ‘employee densities’ (i.e. - average ‘persons per hectare’);
- Consideration of existing vacant lands that are available for industrial / business park uses within the former City boundaries;
- Review of historical industrial land consumption trends for comparison purposes.

6.4.1 Employment Categories and Density Assumptions

To determine land area requirements for future employment, the projected employment growth was subdivided into three general categories as shown above and previously described in Section 4:

- Primary jobs;
- Employment land jobs;
- Population jobs.

For each of these categories, employee / land area requirement ratios were determined by the City of Windsor Planning Services Unit based on their review and analysis of GIS mapping, place of work data (employment numbers, square footage), operations information, etc. for typical employers / industries in Windsor (see Appendix B). Table 6.15 summarizes the employment categories and associated land area requirement estimates determined by that investigation. It should be noted that two-thirds build out was assumed for the employment land jobs as new development in the annexed area will take time to get established. It is not anticipated that full build-out of these operations would occur in the initial twenty-year planning period.

Table 6.15

EMPLOYEE DENSITY / LAND AREA ASSUMPTIONS BY EMPLOYMENT CATEGORY

Employment Category	Land Area (employees/ha)	Additional Assumptions / Comments
Primary Jobs	0	<ul style="list-style-type: none"> ▪ Primary jobs are assumed to be agricultural, forestry, resource, etc. based without an urban land requirement.
Employment Land Jobs - Heavy	100	<ul style="list-style-type: none"> ▪ Assumed to be approximately 25% of the total employment land jobs. ▪ Assumes 2/3 build out of heavy industry at moderate to peak levels of operation. ▪ Assumes at least two shifts and sometimes three.
Employment Land Jobs – Light	18	<ul style="list-style-type: none"> ▪ Assumed to be approximately 75% of employment land jobs ▪ Assumes 2/3 build out at moderate to peak levels of operation. ▪ Assumes at least two shifts and sometimes three.
Population Jobs	65	<ul style="list-style-type: none"> ▪ Indicative of commercial / retail sector jobs

Source: City of Windsor Planning Department, Stantec Consulting



A second method of determining general employee densities was also undertaken for comparison purposes, based on information provided by the City of Windsor regarding total land areas zoned for specific uses, in context with estimated total employment figures, as shown in Table 6.16. The comparison suggests that the employee densities provided in Table 6.15 are more ‘intense’ than exist in the City overall. This may be reflective of larger scale manufacturing and retail / commercial enterprises that exist in the City, as well as more efficient use of land / space due to technological innovation, building design and operational processes that may be occurring in more recent industrial / commercial developments.

Table 6.16
ALTERNATIVE EMPLOYEE DENSITY / LAND USE COMPARISON

Zoning Category	Land Area (ha)	Total Employees (approx.)*	Employee Density (employees/ha)
MD (Manufacturing District)	2,473	43,208	17.5
CD (Commercial District)	964	67,554	48
ID (Institutional District)	438		
TOTAL	3,875	110,762	

* Estimates based on overall ‘Employment’ and ‘Population’ job categorization, excluding Primary Sector Jobs.

6.4.2 Projected Industrial Land Area Requirements

Land area requirements for industrial and related employment were calculated utilizing the medium growth scenario employment projections in association with the land area requirements (persons / hectare) derived for the general employment categories as outlined in Table 6.17. Based on this method, there is a projected need for approximately 528 hectares of industrial and related lands (includes ‘heavy’ and ‘light’ employment land job requirements combined). There is an additional need for approximately 216 hectares of land area to accommodate the range of population jobs that are also projected to be created over the planning period. The total land area requirements identified below to accommodate future employment growth results in an average of approximately 22.6 employees / hectare for industrial / manufacturing oriented jobs and a combined average of 35 employees per hectare for all types of employment.

Table 6.17
PROJECTED LAND AREA REQUIREMENTS FOR FUTURE EMPLOYMENT

Land Area Requirements	# of Jobs	Employee Density	Land Requirements
Primary Jobs	179	0	0
Employment Land Jobs - Heavy	2,990	100	30
Employment Land Jobs - Light	8,969	18	498
Sub-Total (Employment Land)	11,959		528
Population Jobs	14,023	65	216
Total Land Requirements	26,162		744

*Note - Figures may not add up due to rounding

As previously described in this report, interest has also been expressed in the recent past by large scale manufacturing / assembly companies for large tracts of unencumbered land that is suitable for the development of new automotive facilities. Similar facilities developed over the past ten years have absorbed between approximately 162 to 810 hectares. Information was also provided which supported the provision of additional lands for multi-modal transportation facilities as proposed by Canadian Pacific Railway in association with large scale manufacturing enterprises such as automotive assembly plants / campuses. To facilitate the development of such facilities and to ensure Windsor's competitive edge during the twenty year planning horizon, some additional industrial land should be allocated and designated for such purposes. Potential land area requirements for such facilities could be expected to range from 200 to 700 hectares, depending on the type of facility and the extent to which multi-modal transportation facilities were also incorporated.

For the purposes of land needs requirements, an area of approximately 350 hectares (865 acres) is recommended to accommodate the potential need for these large scale manufacturing or multi-modal facilities. This assumes that multi-modal and manufacturing facilities would be integrated to make the most efficient use of land, rather than each requiring approximately 500 acres of land. The resulting land area requirements are provided in Table 6.18.

Table 6.18

TOTAL PROJECTED INDUSTRIAL LAND AREA REQUIREMENTS (MEDIUM SCENARIO)

Land Area Requirements	Area (ha)
Employment Land Jobs – Heavy	30
Employment Land Jobs - Light	498
Employment Land Requirements (Net Area)	528
Large Scale Manufacturing / Multi-Modal	350
TOTAL 'INDUSTRIAL' LAND NEEDS (NET AREA)	878

6.4.3 Existing Industrial Land Inventory

To determine the amount of additional land required for industrial and related purposes in the Annexed Area, existing vacant lands from within the former City of Windsor boundaries must be deducted from the total land area requirements. Information provided by the City of Windsor indicates that there is a total of 185 hectares (457 acres) of land designated and zoned for manufacturing uses of various types. The majority of land for such uses is concentrated in three Planning Districts (Devonshire, Forest Glade, and Ojibway) and only two parcels in Ojibway are of any significant size at approximately 30-35 hectares each. The majority of vacant lands identified by the City of Windsor data are between 0 and 2 hectares.

The Windsor-Essex County Development Commission has advised that it is very unusual for isolated land parcels under two acres to be suitable for industrial / business park purposes. Our analysis of the vacant land data provided by the City of Windsor indicated that there are approximately 125 hectares of land zoned for industrial / business park development that are over 1 hectare and generally more contiguous, therefore likely more suitable for new industrial development. All other vacant industrial lands appear to be small or fragmented parcels that may be more suitable for infill and/or expansion purposes. Given these factors, the resulting availability of vacant and suitable industrial land was estimated to be approximately 125 hectares.

Table 6.1
VACANT INDUSTRIAL LAND SUMMARY

PLANNING DISTRICT	Vacant Industrial Land	Parcels Over 1 ha
Devonshire	24.56	18.17
Forest Glade	22.82	17.24
Ojibway	74.49	74.00
Sandwich	16.19	7.71
Walker Farm	12.99	6.41
TOTAL	151.05	123.53

The City's vacant land inventory also indicated that there was approximately 94 hectares of vacant land designated as Business Park available within the former City limits. Of this, approximately 54 hectares consists of parcels greater than 1 ha, most of which is located in the Forest Glade Planning District. The resulting land area requirements for the medium case scenario, when considered in context with existing industrial land availability, are summarized in Table 6.19.

Table 6.19
NEW ADDITIONAL LAND AREA REQUIRED FOR INDUSTRIAL PURPOSES

	Land Area (ha)
'Employment Jobs' Land Requirements (Net Area)	878
Existing Industrial Lands Available (over 1 ha)	125
Existing Business Park Lands Available (over 1 ha)	55
TOTAL INDUSTRIAL LAND NEEDS (ADDITIONAL LANDS-NET)	698
Employment Land Requirements (Gross Area)	782

These projected land areas represent net requirements as they are based on information derived from site plans and employees for a number of manufacturing and industrial facilities. As a result, the amount of land that is required for streets or other public infrastructure has not been included. These additional requirements typically range from approximately 10% to 15% of overall industrial land areas. For the purposes of converting the net industrial land requirements to gross areas in this report, 12% is assumed as the conversion factor. This results in an adjusted gross land area requirement of 782 hectares by the year 2026 for the medium case scenario.

For comparison purposes, an alternative means of determining industrial and related land use requirements was also undertaken based on land consumption. Industrial land absorption from 1993 to 2002 averaged approximately 27 hectares per year as described in the Employment Projections component of this Study. If this trend continued, it would indicate a need for approximately 540 hectares of additional land over the 20 year planning period. The projected land needs for industrial / business park development (excluding specialized manufacturing / multi-modal facilities) calculated above in Table 6.18 are very similar to what could be anticipated based on land absorption activity since 1993.

6.5 OTHER LAND USE REQUIREMENTS

6.5.1 Commercial / Retail Land Requirements

The employment projections indicated that there would also be growth in the 'population land' categories (e.g. – office, commercial, retail, institutional, etc.) as well as in the manufacturing and related sectors, as shown in Table 6.14.

After taking into consideration applicable assumptions regarding those working at home, those who would be accommodated through workplace intensification and 'major office' workers expected to be located in the downtown core, it was determined that approximately 216 hectares of land would be required to accommodate this demand. It is also assumed that this net land area should be increased by a factor of 12%, consistent with the industrial lands, to allow for roads and related infrastructure. These lands would accommodate retail and commercial, business service, office, health and education and similar uses that are typically accommodated within the Mixed Use, Commercial Corridor, Commercial Centre and some Business Park designations.

The determination of commercial / office land needs also includes an allowance for the amount of vacant commercial land that is estimated to exist, based on our review of City of Windsor vacant land and zoning data, with a resulting need for approximately 153 hectares of additional land for commercial purposes, as shown in Table 6.20.

Table 6.20

PROJECTED LAND AREA REQUIREMENTS FOR COMMERCIAL / OFFICE RELATED EMPLOYMENT

	Area (ha)
'Population Job' Land Area Requirements (Net Area)	216
Existing Vacant Commercial Corridor, Commercial Centre & Mixed Use Lands	79
Land Required for 'Population' Jobs (Net Area)	137
TOTAL POPULATION JOBS ADDITIONAL LAND NEEDS (GROSS AREA)	153

6.5.2 Open Space / Institutional Uses

Other uses that should be considered when determining overall land requirements include lands dedicated to open space and natural heritage, infrastructure (i.e. – major transportation and utility corridors, stormwater management facilities, sanitary treatment facilities, etc.) and institutional uses. Information derived from the City's zoning categories indicates that parks and open space (i.e. – 'Green District') comprise approximately 13% of the City's total land base with institutional land uses comprising nearly 4% of the total land base.

The Essex Region Conservation Authority has also identified a goal of a minimum of 12% for natural area coverage in the annexed lands, which would be outside of any areas dedicated as neighbourhood parks and sports fields. These areas could include stormwater management facilities as well as other natural areas, woodlots, stream corridors, etc.

The City of Windsor Parks and Recreation Department has also indicated that there will be a need for a larger District Park somewhere in the annexed lands, with an area of at least 60 to 100 acres (25 to 40 hectares). To accommodate the foregoing uses, it is recommended that approximately 15% of the total land area dedicated to residential, industrial and commercial type uses be added to the overall land requirements.

Specific land use designations, locations and sizes for most open space and institutional uses are not expected to be allocated at this stage of the planning process with the exception of any areas that are identified as having significant natural heritage features to be protected.

6.5.3 Airport

The Windsor airport is also located within the Study Area and requires land to be set aside and designated for the long term. Land need requirements for the airport have been defined based on the Airport Study component of the Master Plan and have

been determined to be approximately 420 hectares. This land area includes all the lands identified by the airport as being necessary to accommodate airport buildings, control tower(s), runways and associated airport requirements as well as future expansion of any of those facilities.

6.5.4 Existing Uses

The annexed lands also contain a number of existing uses that must be incorporated into the overall land requirements as they are anticipated to remain in the study area during all or a large part of the planning period, given their specific use or age. As a result, the estimated total area of these uses must be deducted from the overall land area to reflect the fact that not all of the annexed lands is available for development. A review of the main existing uses that are expected to remain over the long term indicates that approximately 170 hectares is currently in use and therefore should be excluded from the overall area available for development. These uses include existing clusters of residential and industrial / business park development, churches, a private campground, a hydro substation and recent residential development that has been approved in the northeast 'point' of the annexed lands.

6.5.5 Contingency Factor

Because it is impossible to make precise predictions regarding future economic conditions and their impact on population and employment growth, a contingency factor should be considered to provide flexibility for future uncertainty and to guard against potential under supply. It is recommended that a contingency factor of 5% of the total land area requirements (excluding existing uses and airport requirements) be added to the overall lands to be designated.

6.6 TOTAL LAND USE REQUIREMENTS

The projected total land needs requirements are estimated to be 2,440 hectares for the general land use categories, as summarized below in Table 6.21. This required land is slightly under the total land area that exists within the annexed land boundaries. However, as the remaining area would be very small relative to the overall area, it would be logical to identify Official Plan designations for the entire area rather than establish an urban growth boundary within the annexed lands that excludes a very small portion.

CITY OF WINDSOR ANNEXED AREA MASTER PLAN STUDY
LAND NEEDS REQUIREMENTS (UPDATED)

Table 6.21

SUMMARY OF TOTAL PROJECTED LAND NEEDS REQUIREMENTS

Land Use	Gross Area Required (ha)	% of Total Land Req.	Existing City	%
Residential	597	24.5%	5,919	50.4%
Industrial	782	32.1%	2,807	23.9%
Commercial / Office	153	6.3%	1,042	8.9%
Other (Open Space, Institutional)	230	9.4%	1,983	16.9%
SUB-TOTAL	1,762			
Contingency (5% of Sub-total)	88	3.6%	n/a	n/a
Existing Land Uses	170	7.0%	n/a	n/a
Airport	420	17.2%	n/a	n/a
TOTAL LAND REQUIREMENTS	2,440	100.0%	11,751	100.0%

Notes:

- 'Other' land uses represent 15% of total area required for Residential, Industrial and Commercial /Office uses.
- Industrial includes 350 ha for large scale manufacturing and/or multi-modal facilities
- Residential includes contingency factor to allow for full range of housing choice

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APPENDIX A

METHODOLOGY FOR DETERMINING POTENTIAL CAPACITY OF VACANT RESIDENTIAL LANDS

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APPENDIX B

METHODOLOGY FOR DETERMINING EMPLOYEE DENSITY

(provided by City of Windsor, 2003)

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