



Stantec

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

LAND NEEDS REQUIREMENTS

Prepared for:

Corporation of the City of Windsor
Windsor, ON

Prepared by:

Stantec Consulting Ltd.
800-171 Queens Avenue
London, ON N6A 5J7

Tel: 519-645-2007

Fax: 519-645-6575

614-01073

July 3 2003

Copyright © Stantec Consulting Ltd. 2003

Stantec

CITY OF WINDSOR ANNEXED AREA MASTER PLAN STUDY

Table of Contents

	Page
6.0 LAND NEEDS REQUIREMENTS	1
6.1 INTRODUCTION	1
6.2 METHODOLOGY	1
6.3 RESIDENTIAL LAND REQUIREMENTS	2
6.3.1 Vacancy Rates	3
6.3.2 Existing Housing Supply	4
6.3.3 Intensification and Infill	5
6.3.4 Demolition and Conversion	7
6.3.5 Existing Residential Land Capacity	7
6.3.5.1 Approved Plans of Subdivision	9
6.3.5.2 Density Assumptions	9
6.3.5.3 Vacant Land Zoning	10
6.3.5.4 Summary of Estimated Residential Yield from Vacant Lands	11
6.3.6 Residential Land Requirements Summary	12
6.4 INDUSTRIAL LAND REQUIREMENTS	13
6.4.1 Employment Categories and Density Assumptions	14
6.4.2 Projected Industrial Land Area Requirements	16
6.4.3 Existing Industrial Land Inventory	17
6.5 OTHER LAND USE REQUIREMENTS	19
6.5.1 Commercial / Retail Land Requirements	19
6.5.2 Land Requirements for Other Uses	20
6.5.2.1 Open Space / Institutional Uses	20
6.5.2.2 Airport	21
6.5.2.3 Existing Uses	21
6.5.3 Contingency Factor	21
6.6 TOTAL LAND USE REQUIREMENTS	21

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 104,287 dwelling units by the end of the planning period in 2021, as summarized below in Table 6.1. Future housing demand is expected to continue to be dominated by single family detached dwellings, given 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

Source – Statistics Canada 2003, City of Windsor

To convert the total housing demand projections into residential land area requirements, the following factors must also 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 must be 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 risen recently, but are still lower than the vacancy rates in 1997-98. Table 6.2 provides a summary of vacancy rate trends since 1996. These rates include apartments containing three or more units and row housing. Vacancy rates for other forms of housing (i.e. – single detached, semi-detached, etc.) are not available, but are assumed to be similar to those for apartments and rowhousing. For the purposes of determining residential land requirements, a vacancy rate of 3.3% is assumed, equivalent to the average vacancy rate between 1996 and 2002.

Table 6.2
VACANCY RATES (%)

	1996	1997	1998	1999	2000	2001	2002	Average
Apartment / Row House	2.8	4.5	4.3	2.7	1.9	2.8	3.9	3.3

Source: CMHC, Rental Market Report, November 26, 2002.

When the future housing demand projections are adjusted to account for an assumed vacancy rate of 3.3%, the revised total housing demand at the end of the planning period is expected to be just under 108,000 units as shown in Table 6.3.

Table 6.3
HOUSING DEMAND AS ADJUSTED FOR VACANCY RATES

	Total Projected Need (2021)	Total Demand as Adjusted for Vacancy Rate
Single Detached	66,612	68,811
Semi-detached	4,030	4,163
Rowhouse	5,469	5,649
Apartment/detached duplex	3,812	3,938
Apartment < 5 storeys	14,743	15,230
Apartment ≥ 5 storeys	9,621	9,938
TOTAL	104,287	107,728

Source: Statistics Canada, City of Windsor Infrastructure Services Building Unit (2002 Building Activity Report)

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 must be 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 information indicates 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 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 17,705 additional units is projected to be required over the twenty year planning period.

Table 6.4
NET HOUSING DEMAND

	Total Housing Demand (2021)	Existing (2001) Housing Stock	2002 Additions to Stock	Net Housing Demand
Single Detached	68,811	55,193	880	12,737
Semi-detached	4,163	3,604	222	337
Rowhouse	5,649	4,738	178	734
Detached Duplex / Apt.	3,938	3,514	10	414
Apartments	25,168	21,484	190	3,494
TOTAL	107,728	88,533	1,475	17,715

Source: Statistics Canada, City of Windsor Infrastructure Services Building Unit (2002 Building Activity Report)

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. Information provided by the City of Windsor regarding vacant lands indicates that there are approximately 95 hectares of undeveloped 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 the potential impact of intensification and associated assumptions for future yield, information provided by the City of Windsor Planning Services Unit and Building Department was reviewed to determine the extent of building permit activity in recent years for those Planning Districts that are primarily built out. The analysis included units added to existing dwellings as well as new dwelling units. Based on this review, it is 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.

CITY OF WINDSOR ANNEXED AREA MASTER PLAN STUDY
LAND NEEDS REQUIREMENTS

Table 6.5
INFILL AND INTENSIFICATION ACTIVITY – 1996 TO 2001

Type of Residential Building Activity	Intensification / Infill Units	Total Units Constructed**	% Allocated to Infill / Intensification
Multi-family Residential*	686	2,273	30%
Single family Residential	143	4,383	3.3%
Accessory Apartments in Existing Dwellings	2	2	100%
Additional Dwelling Units in Existing Buildings	148	148	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 is available for the split between apartments and rowhousing or other multi-family dwellings such as semi-detached or duplex units, City of Windsor Planning staff advised that the majority of ‘multi-family residential’ infill development that occurred since 1996 consisted of apartment / condominium units. It is further estimated by the Planning Department that the majority of apartment / condominium development (approximately 70%) is less than six storeys in height. As the total number of apartments / condos constructed in Windsor between 1996-2001 was 726, it is estimated that up to 75% of those apartments were created through infill / intensification.

A total of 619 rowhousing units were created over that same timeframe, with the majority of this type of medium density development occurring primarily in high growth (i.e. – greenfield areas) rather than through infill and intensification. However, it is reasonable to assume that a certain proportion of medium density rowhouse development could potentially occur in the future on those smaller vacant land parcels that exist within developed areas and on obsolete / underutilized sites suited for redevelopment.

Based on the foregoing data, in context with the amount of land that is currently available within the developed areas of the City and the zoning that exists on those lands, it is assumed that the following proportions of housing demand can be met through infill and intensification:

- Lower density (single family, semi-detached) – 3 to 5%
- Row housing and detached duplex/apartment – 25%
- Apartments (including low and medium-high rise) – 50%.

Resulting housing demand requirements after taking infill and intensification into account are shown in Table 6.6. This indicates that approximately 14% of the net housing demand is expected to be accommodated through infill and intensification, which is relatively close to the proportion that occurred between 1996-2001. The approximate amount of land required to accommodate this level of infill and intensification is 70 hectares assuming typical densities.

Table 6.6
HOUSING DEMAND
EXPECTED TO BE ACCOMMODATED BY INFILL AND INTENSIFICATION

	Net Housing Demand	Intensification Factor	Units Developed by Intensification	Resulting Housing Demand	Resulting Housing Mix
Single Detached	12,737	3%	382	12,356	80.84%
Semi-detached	337	5%	17	321	2.10%
Rowhouse	734	25%	183	550	3.60%
Duplex / Apt.	414	25%	103	310	2.03%
Apartments	3,494	50%	1,747	1,747	11.43%
TOTAL	17,715		2,432	15,283	100.00%

6.3.4 Demolition and Conversion

Information obtained from the City of Windsor Building Division indicates that there were few demolition permits issued over the previous five years, as shown in Table 6.7. 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.

Table 6.7
RESIDENTIAL BUILDING DEMOLITION ACTIVITY

	1997	1998	1999	2000	2001	2002	Average
# of Demolition Permits	87	111	102	107	107	83	100

6.3.5 Existing Residential Land Capacity

A detailed review of vacant land availability undertaken by the City of Windsor estimated that there are approximately 762 hectares of residentially designated land available at the present time in the City of Windsor. Much of this land is dispersed throughout the City and consists of small remnant parcels that would primarily be



CITY OF WINDSOR ANNEXED AREA MASTER PLAN STUDY
LAND NEEDS REQUIREMENTS

considered as infill opportunities as described in Section 6.3.3. A summary of the existing residential vacant land inventory is provided in Table 6.8. Shaded cells identify 'high growth' planning districts that still contain larger tracts of undeveloped land or draft approved, but as yet undeveloped areas. Vacant lands in the remaining planning districts reflect those areas where it has been assumed that infill and intensification are likely to occur.

Table 6.8
EXISTING VACANT RESIDENTIAL LAND INVENTORY

Planning District	Vacant Residential Land (ha)	Draft Approved Area (ha)
City Centre	3.20	
Devonshire	3.00	
East Windsor	12.50	
Malden	12.20	
Ojibway	0.00	
Remington Park	10.70	
Sandwich	7.70	
South Central	2.90	
Fountain Bleu	5.40	
South Walkerville	1.70	
University	8.00	
Walker Farm	0.00	
Walkerville	6.20	
Riverside	12.20	
TOTAL VACANT LAND	598.60	
'HIGH GROWTH' VACANT LAND*	502.90	163.5

* Shading identifies 'high growth' Planning Districts



Within the 'high growth' areas, draft approved plans exist for portions of three communities (East Riverside, South Cameron, Roseland) and larger blocks of land are still available for development in two other communities (Forest Glade and South

CITY OF WINDSOR ANNEXED AREA MASTER PLAN STUDY
LAND NEEDS REQUIREMENTS

Windsor). All other vacant lands, totaling 95.7 hectares, are small, dispersed sites within developed communities and are considered as infill and intensification opportunities. As infill and intensification have already been accounted for previously, no further allowance is made for these small parcels of land. The development capacity of the larger parcels of vacant land was determined based on a review of information provided by the City of Windsor regarding draft approved plans, zoning categories for vacant lands, and application of general density and housing mix assumptions.

6.3.5.1 Approved Plans of Subdivision

Information was provided by the City of Windsor Planning Department regarding the residential yield expected from a number of subdivision plans that have been approved but where construction has not yet occurred as summarized in Table 6.9. It is important to note that these figures are estimates only as some subdivision plans are block plans and precise unit yields are not available.

Table 6.9
RESIDENTIAL YIELD FROM APPROVED SUBDIVISION PLANS

File No	Planning District	Single-Detached	Semi-Detached	Row	Apartment	Total
SDN-001/02	East Windsor	14				14
SDN-002/02	East Riverside	9				9
SDN-003/02	South Cameron	32				32
SDN-005/02	East Riverside	227				227
SDN-006/02	East Riverside	39		230		269
SDN-001/03	South Cameron	205				205
SDN-002/03	East Riverside	672*	144*	144*		960
SDN-003/03	East Riverside	58	92			150
CDM-001/02	Riverside				55	55
CDM-001/03	Fontainbleu				40	40
CDN-002/03	Forest Glade				84	84
Total		1,256	236	374	179	2,045

Source: City of Windsor Planning Department

*Estimates only as subdivision plans are 'block' plans

6.3.5.2 Density Assumptions

A review of residential development conducted by the City of Windsor regarding recent development activity indicated that typical gross densities for various types of housing in greenfield situations are as follows:

- Single family detached - 10 units/hectare



- Semi-detached – 17 units/hectare
- Duplex – 20 units/hectare
- Row housing – 34 units/hectare
- Low rise apartments (5 stories or less) – 55 units/hectare
- Medium / high rise apartments – 100 units/hectare.

Information regarding the split between low and medium/high rise apartments for recently constructed or approved apartment development is not available. In addition, it is likely that the demand propensities for low versus medium/high rise apartments reflects the availability, location and affordability of those units more so than an entrenched demand for a specific height of an apartment. Therefore, for the purpose of generating land needs requirements in this report, low and medium/high rise apartments have been combined and a density of 75 units / hectare is assumed for apartments in general.

It is also assumed that single family housing still to be developed in existing areas will have similar in density to that which has been constructed in recent years (i.e. – 10 units per hectare). However, it is anticipated that single family detached densities will increase slightly for new greenfield development areas in the future, given industry wide development trends and increasing market demand for smaller lots in many municipalities. For this reason, it is assumed that new single family detached housing will have a density of 11 units per hectare, which represents an increase of 10%.

These gross densities are assumed to include roads, neighbourhood parks and school sites and small areas of neighbourhood commercial development in addition to the land area occupied by dwellings / lots. The overall proportion of land assumed to be typically consumed by these non-residential uses is approximately 35% (split between 25% roads and 10% parks and open space) based on an analysis undertaken by the City of Windsor.

6.3.5.3 Vacant Land Zoning

To further assist in approximating the potential yield available from ‘true’ vacant lands, zoning information provided by the City of Windsor was reviewed and assumptions made regarding the ultimate development of the lands given the existing zoning. Vacant land zoning and associated land areas were allocated as shown in Table 6.10.

Table 6.10
RESIDENTIAL VACANT LAND AREAS AND ZONING

General Density Category	Zones	Land Area
Low Density*	RD1.1, RD1.2, RD1.3, RD1.4, RD1.5, RD1.6, RD1.7, RD2.1, RD2.4	226.1
Medium Density	RD2.2, RD2.3, RD2.5, RD3.1	245.6
High Density	RD3.2, RD3.3, RD3.4	30.8
TOTAL		502.5

* Note – Low density includes those zones that are exclusively single detached as well as those that permit semi's and duplexes in addition to singles.

To determine the potential yield of vacant land within the 'medium density' and 'high density' categories, the land areas were further divided (as shown in Table 6.11) based on the estimated proportion of land area developed for medium and high density forms of housing over the past five years.

6.3.5.4 Summary of Estimated Residential Yield from Vacant Lands

Based on the foregoing information and assumptions, the residential development capacity of the vacant lands is calculated to be approximately 13,951 units as shown in Table 6.11.

Table 6.11
ESTIMATED DEVELOPMENT CAPACITY OF VACANT LANDS (NUMBER OF UNITS)

	Draft Approved Units	Remaining Vacant Land (ha)*	Assumed Density	Potential Yield from Vacant Lands	Total Estimated Yield
Single Detached	1,256	226	10	2,261	3,517
Semi-detached	236	150	17	2,547	2,783
Rowhouse	374	54	34	1,837	2,211
Duplex / Apt.	0	10	20	196	196
Apartment	179	63	75	4,705	4,884
TOTAL	2,045	502.5		11,546	13,591

Source: City of Windsor Planning Department, Stantec Consulting



A high proportion of the potential yield is shown as being developed for medium and high density forms of housing given the existing zoning which permits these forms of development. 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 higher

densities that are permitted by the zoning by-law and that the housing mix within medium density zones will be generally consistent with recent development trends. It is fully acknowledged that these vacant lands could potentially be developed for single-family detached dwellings instead, or that the housing form mix could change.

6.3.6 Residential Land Requirements Summary

The total land area required after taking into consideration vacancy rates, intensification and the potential yield from existing draft approved and vacant lands within the former City boundaries is calculated to be approximately 809 hectares as shown in Table 6.12.

Table 6.12
TOTAL RESIDENTIAL LAND NEEDS REQUIREMENTS

	Total Housing Demand*	New Housing Demand*	Vacant Residential Land Capacity	Remaining Housing Need	Assumed Gross Density	Land Area Requirements (ha)
Single Detached	68,811	12,356	3,517	8,839	11	803
Semi-detached	4,163	321	2,783	-2,462	17	0
Rowhouse	5,649	550	2,211	-1,661	34	0
Duplex / Apt.	3,938	310	196	114	20	6
Apartments	25,168	1,747	4,884	-3,137	75	0
TOTAL	107,728	15,283	13,591			809

* Note – As adjusted for vacancy rates, existing housing stock, infill and intensification

As shown, almost all of the overall demand is comprised of lands required for low density (i.e. – single family detached) development. Sufficient vacant land area, already zoned to permit a range of medium and high-density development, is available within the former City boundaries to accommodate future housing demand for these types of housing. However, as the existing zoning generally permits single family detached dwellings in addition to other forms of 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 land to accommodate medium and high density residential development during the planning period.



It is also important to recognize that a range of housing types and densities should be provided within individual communities and neighbourhoods to provide future

residents with choice in location, tenure, affordability, etc. The land needs requirements outlined above have not incorporated any additional land area to accommodate the full range of housing choices in new areas. However, it is reasonable to expect that some of the vacant lands will be developed for single family development thereby providing the opportunity to “trade off” lands for medium / high density housing within the additional land requirements that have been identified by the foregoing analysis. In addition, future Official Plan reviews will afford the opportunity to identify potential shortfalls as the twenty-year planning period proceeds.

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.

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.

For reference purposes, Table 6.13 summarizes the projected ‘additional employment’ scenarios and associated adjustments as previously calculated in Section 4 of this report.

Table 6.13
SUMMARY OF ADJUSTED EMPLOYMENT PROJECTIONS (2021)

	Low	Medium	High
Projected Additional Employment	12,150	25,505	48,044
Home Based Workers (2.5%)	304	638	1,201
Workplace Intensification (2%)	237	497	937
Major Office Workers (15% of Population Jobs)	1,043	2,190	4,125
Projected Employed Population Requiring Land*	10,567	22,182	41,784

* Note – Numbers may not add precisely due to rounding

6.4.1 Employment Categories and Density Assumptions

To determine land area requirements for future employment, the projected employment growth was further subdivided into three general categories, 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. Table 6.14 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.

CITY OF WINDSOR ANNEXED AREA MASTER PLAN STUDY
LAND NEEDS REQUIREMENTS

Table 6.14
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	30	<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 low to moderate levels of operation. Assumes one shift but usually up to two shifts.
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 6.15. The comparison suggests that the employee densities provided in Table 6.14 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 6.15
ALTERNATIVE EMPLOYEE DENSITY / LAND USE COMPARISON

Zoning Category	Land Area (ha)	Total Employees (approx.)*	Employee Density (employees/ha)
MD (Manufacturing District)	2 473	45 174	18
CD (Commercial District)	964	69,374	49
ID (Institutional District)	438		
TOTAL	3,875	114,548	



It should be noted that the alternative comparison has not made allowances for ‘at-home’ workers, those with no fixed place of work or those employed in ‘Green Districts’. Such allowances could be expected to reduce the employee density slightly. This reduction would be offset to some extent by the fact that these figures represent gross densities for the most part, rather than net densities.

6.4.2 Projected Industrial Land Area Requirements

Land area requirements for industrial and related employment are 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 6.16. Comparison land areas are also shown for the low and high growth scenarios for information purposes. Based on this method, there is a projected need for approximately 475 hectares of industrial and related lands (includes ‘heavy’ and ‘light’ employment land job requirements combined). There is an additional need for approximately 191 hectares of land area to accommodate the range of population jobs that are also projected to be created over the planning period.

Table 6.16
PROJECTED LAND AREA REQUIREMENTS FOR FUTURE EMPLOYMENT

Land Area Requirements	Low Scenario	Medium Scenario	High Scenario
Primary Jobs	0	0	0
Employment Land Jobs - Heavy	38	79	149
Employment Land Jobs - Light	189	396	746
Sub-Total (Employment Land)	227	475	895
Population Jobs	91	191	360
Total Land Requirements	317	666	1,255

*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, additional industrial land should be 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 for the combined needs of these specialized manufacturing / 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 6.17.

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 924 hectares for the medium case scenario.

Table 6.17
TOTAL PROJECTED INDUSTRIAL LAND AREA REQUIREMENTS (MEDIUM SCENARIO)

Land Area Requirements	Medium
Employment Land Jobs – Heavy	79
Employment Land Jobs - Light	396
Employment Land Requirements (Net Area)	475
Large Scale Manufacturing / Multi-Modal	350
TOTAL 'INDUSTRIAL' LAND NEEDS (NET AREA)	825
Employment Land Requirements (Gross Area)	924

6.4.3 Existing Industrial Land Inventory

To determine the net amount of additional land required for industrial and related purposes, 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 334 hectares (825 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, Malden and Ojibway) and none of these parcels are larger than 100 hectares. According to the Windsor-Essex County Development Commission, approximately 190 hectares (470 acres) of the vacant industrial lands are held by specific companies (e.g. – Ford Essex, Daimler Chrysler, Lear and Valiant) for future expansion. These lands are

therefore not available for other interested purchasers / tenants and should be deducted from the total vacant land. As a result, opportunities for larger scale manufacturing facilities or other space intensive uses are very limited.

In addition, a number of these parcels are technically 'vacant' but are not of appropriate size or configuration to be developed. The Windsor-Essex County Development Commission indicates that it is very unusual for isolated land parcels under two acres to be suitable for industrial / business park purposes. An analysis provided by the City of Windsor indicated that there are approximately 62 hectares of land zoned for industrial / business park development that are under 2 acres and would therefore not be suitable for new industrial or business park development. Given these factors, the resulting availability of vacant and suitable industrial land is estimated to be approximately 82 hectares.

The resulting land area requirements for the medium case scenario, when considered in context with existing industrial land availability, are summarized in Table 6.18.

Table 6.18
NEW ADDITIONAL LAND AREA REQUIRED FOR INDUSTRIAL PURPOSES

	Land Area (ha)
'Employment Jobs' Land Requirements (Gross Area)	924
Existing Industrial Lands Available	82
TOTAL INDUSTRIAL LAND NEEDS (ADDITIONAL LANDS)	842

It should be noted that land area requirements identified above incorporate both industrial and business park uses, which have separate Official Plan designations. The City of Windsor estimates that zones permitting business park uses / development represent approximately 12% of all Manufacturing District zoning. Therefore, it is anticipated that approximately 100 hectares of the land area recommended for industrial purposes should be designated as Business Park, with the remaining area (742 hectares) designated as Industrial.

An alternative means of determining industrial and related land use requirements was undertaken based on land consumption. Industrial land absorption scenarios, based on the five year and ten year averages of actual land consumption as described in Section 4.3.3 of this report, resulted in a need for approximately 420 to 680 hectares of additional industrial land over the twenty year planning period as shown in Table 6.19. The projected land needs for industrial / business park development (excluding specialized manufacturing / multi-modal facilities) calculated above are generally lower than what could be anticipated based on recent land absorption activity, as

shown below in Table 6.19. Consequently, it is likely that the land needs requirements calculated in Table 6.18 represent a relatively conservative estimate.

Table 6.19

INDUSTRIAL LAND REQUIREMENTS BASED ON ABSORPTION TRENDS

Scenario	Annual Land Consumption (ha)	20 Year Requirement (ha)
Low (1991-97 average)	21	420
Medium (1993-2002 average)	27	540
High (1998-2002 average)	34	680

Source – Windsor-Essex County Development Commission

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 6.20.

Table 6.20

EMPLOYMENT GROWTH PROJECTIONS BY INDUSTRY SECTOR – MEDIUM SCENARIO

Growth Rate - 1.0% per Year				
Sector	2001 Actual	2001 Adjusted	2021 Estimate	# of New Jobs
Agriculture / Resource	1,079	1,282	1,564	282
Manufacturing / Construction	32,096	38,132	46,528	8,396
Wholesale / Retail	13,162	15,637	19,080	3,443
Finance / Real Estate	3,463	4,115	5,021	906
Health / Education	14,208	16,880	20,597	3,717
Business Services	12,869	15,289	18,655	3,366
Other Services	20,618	24,496	29,890	5,394
Total Experienced Labour Force	97,495	115,831	141,336	25,505

* Note – 2001 industry sector totals have been adjusted to reflect the estimated total employed labour force, assuming the same proportions per sector as exist for the labour force residing in Windsor.



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 191 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.

Table 6.21
PROJECTED LAND AREA REQUIREMENTS FOR COMMERCIAL / OFFICE RELATED EMPLOYMENT

	Area (ha)
'Population Job' Land Area Requirements (Net Area)	191
Total Population Job Land Requirements (Gross Area)	214
Existing Vacant 'Commercial District' Lands	78
TOTAL COMMERCIAL/OFFICE LAND NEEDS (ADDITIONAL LANDS)	136

Table 6.21 also includes an allowance for the amount of vacant commercial land that is estimated to exist, based on City of Windsor review of applicable zones and GIS mapping, with a resulting need for approximately 136 hectares of additional land for commercial purposes.

6.5.2 Land Requirements for Other Uses

6.5.2.1 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. To accommodate the foregoing uses, it is recommended that approximately 5% of the total land area dedicated to residential, industrial and commercial type uses be added to the overall land requirements. This reflects that fact that a substantial portion of open space/ parkland and institutional land requirements has already been assumed to be incorporated within the gross area allocated to residential uses (i.e. – approximately 10%).



Specific land use designations, locations and sizes for 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. These significant areas would be outside the amount proposed to be set aside for open space / institutional uses.

6.5.2.2 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.

6.5.2.3 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 145 hectares is expected to be 'undevelopable'. These uses include existing clusters of residential and industrial / business park development, churches, a private campgrounds and a hydro substation.

6.5.3 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. As a certain level of flexibility has already been provided for in the industrial lands category, through the inclusion of lands for major employment scenarios, it is recommended that a contingency factor of 5% of the total land area requirements (excluding existing uses and airport requirements) be included.

6.6 TOTAL LAND USE REQUIREMENTS

The projected total land needs requirements are estimated to be 2,536 hectares for the general land use categories, as summarized below in Table 6.23. This required land is slightly in excess of the total land area that exists within the annexed land boundaries and indicates that there will be a need to identify Official Plan

CITY OF WINDSOR ANNEXED AREA MASTER PLAN STUDY
LAND NEEDS REQUIREMENTS

designations for the entire area rather than a need to establish an urban growth boundary within the annexed lands.

Table 6.23

SUMMARY OF TOTAL PROJECTED LAND NEEDS REQUIREMENTS

Land Use	Gross Area Required (ha)	% of Total Land Req.	Existing City	%
Residential	809	31.9%	5,919	50.4%
Industrial	842	33.2%	2,807	23.9%
Commercial / Office	136	5.4%	1,042	8.9%
Other (Open Space, Institutional)	89	*3.5%	1,983	16.9%
SUB-TOTAL	1,876			
Contingency (5% of Sub-total)	94	3.7%	n/a	n/a
Existing Land Uses	145	5.7%	n/a	n/a
Airport	420	16.6%	n/a	n/a
TOTAL LAND REQUIREMENTS	2,536	100.0%	11,751	100.0%

* 'Other' land uses represent 5% of total area required for Residential, Industrial and Commercial /Office uses. This translates to 3.5% of the total land requirements when airport, existing land use and contingency allowances are included.

DRAFT