IBI GROUP

Final Report

Phase 1: Conventional Transit Master Plan

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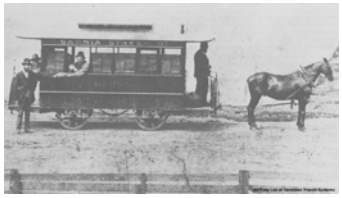
1. Introduction

The city of Sarnia has a population of approximately 72,355 and is the largest city on Lake Huron and in Lambton County. It is located where the upper Great Lakes empty into the St. Clair River. The port of Sarnia remains an important centre for lake freighters and ocean-going ships carrying cargoes of grain and petroleum products.

The name "Sarnia" is Latin for “Guernsey” taking its name from one of the islands in the English Channel off the coast of Normandy. The area now forming the city was first settled in the 1830s as Port Sarnia with the name having been proposed by the Lieutenant-Governor of Upper Canada, Sir John Colborne, who had been Governor of the Isle of Guernsey prior to arriving in Upper Canada.[1] The settlement became incorporated as the Town of Sarnia in 1856 and as a City in 1914.[2]

The early growth of Sarnia was stimulated by the wealth of adjoining stands of timber and by the discovery of oil in nearby Oil Springs in 1858, the first place in Canada and North America to drill commercially for oil. Early growth was also influenced by the arrival of The Great Western Railway in 1858 and the Grand Trunk Railway in 1859. These rail lines were later linked directly to the United States by the opening of a rail tunnel under the St. Clair River in 1889. A link for vehicles was established by the opening of the Bluewater Bridge in 1938. The complex of refining and chemical companies, called Chemical Valley and located south of downtown Sarnia, continues today as a major source of employment and a vital part of the City and the surrounding County’s economy.

On 1 January 1991, Sarnia and the neighbouring Town of Clearwater were amalgamated as the new city of Sarnia-Clearwater. The amalgamation was originally to include the village of Point Edward (population 2,030) but the village's residents declined and remained independent of the city. On 1 January 1992, the City reverted to the name “Sarnia”.[3]



Public transit service has a long history in Sarnia dating to 1875 when the Sarnia Street Railway Company introduced horse-drawn streetcars on an initial route along Davis, Front, Exmouth and Bayview Park to Point Edward. The street railway was electrified in 1901 notably representing the last commercial operation of horsecars in Canada.[4] The electric cars and Street Railway company ceased operation in 1931 with buses replacing the electric cars and operated by a private company, Sarnia Bus Company Limited. Private operation of the transit service continued until April 1974 when the City purchased the operation from Charterways Transportation.

[1] Wikipedia
[2] City of Sarnia website.
[3] City of Sarnia website.
[4] All-Time List of Canadian Transit Systems.

Today, transit service is provided within the city of Sarnia and, through a service agreement, in the Village of Point Edward. Both **conventional** (Sarnia Transit) and **specialized** (Care-A-Van) transit services are operated.

1.1 Study Objectives

The last major review of Sarnia's public transit services was undertaken in 1991 followed by a smaller operational review in December 2000. Over the intervening years, many changes have taken place in the City in terms of development, employment and demographics. These factors highly influence travel patterns and the transportation needs and expectations of area residents. As a result, the City decided to undertake both a comprehensive review of its transportation needs and prepare a new Transportation Master Plan (TMP) as well as to conduct a comprehensive review of its public transit services within the context of the TMP and prepare a new public transit master plan for both Sarnia Transit and the Care-A-Van service.

The key objectives of the Transit Master Plan are:

1. To develop short term, mid-term and long term recommendations for improvements that will result in an improved service delivery and efficiency strategy.

2. To complete a review of existing transit services, both conventional and specialized, and clarify the City's strategic priorities for delivery of services and operations, while focusing on the overall quality, performance and efficiency of transit services and on the role transit plays in the city.

The study is to investigate the current and future transit needs of the community and stakeholders within the context of the City's overall TMP and to assess whether transit services are well-positioned to meet those needs.

Of particular importance, the review of the conventional transit service is to determine the need and optimum location for a transit terminal and assess the impact on existing and future routes and ridership. This will be achieved through an analysis of travel patterns, ridership needs and the design of the most effective transit route network.

Overall, the final outcome of this project is to have a Transit Master Plan covering both the conventional and specialized transit services as part of the City's overall Transportation Master Plan which will provide practical and cost effective improvements to Sarnia's transit services for the coming years along with an implementation strategy for the consideration of City Council.

1.2 Study Process

The study process consists of two separate but parallel phases: Phase 1 focuses on an analysis of the conventional transit service, Sarnia Transit; Phase 2 focuses on analysis of the specialized transit service, Care-A-Van. The results of these two phases would be combined in the final transit master plan report.

The study process involves four key elements:

1. Preparation of a Short Term Conventional Transit Service Improvement Plan. This plan would identify and recommend short term transit service improvements for the conventional transit service to address key operational and customer identified issues. This Plan would be based on extensive consultation with key transit stakeholders including transit employees as well as a critical assessment of the existing transit services;

2. Confirm the need for and location of a main transit terminal. This deliverable would recommend the most appropriate approach for the conventional transit system and its customers together with recommended route changes, and would be based on a review of previous reports, the results of the service improvements identified in the short term transit service improvement plan and input from transit stakeholders;

3. Specialized Transit/Care-A-Van Review and Assessment. Review all aspects of the specialized transit service and identify future needs, operational practices and resource requirements for the specialized transit service.

4. Prepare a Transit Master Plan. This Plan would incorporate the Short Term Transit Service Improvement plan but provide medium and long term plans for the City's conventional transit services. It would also incorporate and build on the specialized transit service review conclusions. The Plan would be based not only on projected future community and transportation needs and assumptions but primarily on the role and objectives established for public transit as a core component of the City's overall transportation system through the Transportation Master Plan work.

1.3 Study Approach

The approach to this study has involved the following activities:

- Extensive consultations with all of the City's transit stakeholder groups including users and non-users, employees at all levels, business leaders, students, municipal representatives and inter-municipal and Regional representatives through focus group, public information centre and personal meetings;
- A review of transit demand, population demographics and future population and growth trends as well as changes in development patterns;
- A review of transit operations and system performance to identify service deficiencies, needs and opportunities for improvement;
- A Peer Review of similar size systems;
- A review of the department organization structure and staffing levels;
- A review and assessment of the system's infrastructure (transit garage, terminals, stops and shelters);

- Analysis of route ride counts taken by Sarnia Transit staff supplemented by on-board and on-site observations of ridership patterns and transit operations; and

- A review of various reports and documents related to the operation and management of the transit system.

Meetings with the TMP Steering Committee and senior transit staff have been held at regular intervals to review the study progress and receive and review interim reports.

During the course of the study and recognizing the timeline involved in developing longer term solutions, priority attention has been given to immediate operational issues to resolve service delays affecting the conventional transit service as well as fare policies and accessibility issues. Individual technical memoranda were prepared for review and use by transit staff and the City to address each of those issues. These form part of the following report.

The following report presents the **conventional transit service** component of the overall Transit Master Plan. Two separate reports document the review of the Care-A-Van component of the Transit Master Plan with applicable recommendations, and the recommended Technology (ITS) Needs Plan which was a separate study component.

2. Background

2.1 System Context

Sarnia Transit operates fixed-route and demand-response transit service within the city of Sarnia and under contract in the village of Point Edward. Over 1.3 million passenger trips were taken on Sarnia Transit in 2012. Service is provided seven days a week and generally from 6:30 a.m. to 11:00 p.m. on weekdays, 8:00 a.m. to 11:00 p.m. on Saturdays, and 8:30 a.m. to 6:30 p.m. on Sundays.

The system is comprised of a network of 11 main routes, which include two peak-only routes, one route serving the village of Point Edward and one route serving Bright's Grove. Supplementing regular service routes are special trips on routes serving secondary schools, Lambton College, and Chemical Valley. There are separate distinct route network and route variations for weekdays, weekday evenings and Saturdays and Sundays. A demand-response service is provided in the evenings in one area of the city replacing two fixed routes (5 and 7).

The transit route network has two main types of routes:

- Cross-town (east-west) routes that serve major corridors and connect major destinations and transit terminals; and
- Local and neighbourhood routes that primarily serve or feed into the crosstown routes.

There are three major transfer points where Sarnia Transit's routes converge and timed transfers are provided for users who must take more than one route to complete their trip:

- **Downtown Sarnia** terminal, located along the southwest corner of George Street and Vidal Street North, adjacent to Bayside Mall;
- **Northgate** terminal, located at the rear of the Shoppers Drug Mart at Exmouth Street and East Street; and
- **Murphy Road** terminal, located adjacent to the Superstore at Murphy Road and London Road.

Generally, all cross-town routes serve both the Downtown and Murphy Road terminals, while the Northgate terminal primarily provides connections to local routes serving the north end of Sarnia.

Sarnia Transit has a fleet of 23 vehicles, with a mix of large and small high-floor and low-floor accessible buses and paratransit vehicles. Fifteen buses are utilized during peak periods. The transit department employs 74 full and part-time people for the combined conventional and CAV services. Section 3 provides an overall analysis of system and route ridership, operations, and performance.

Exhibit 2-1: Weekday Day Service Network

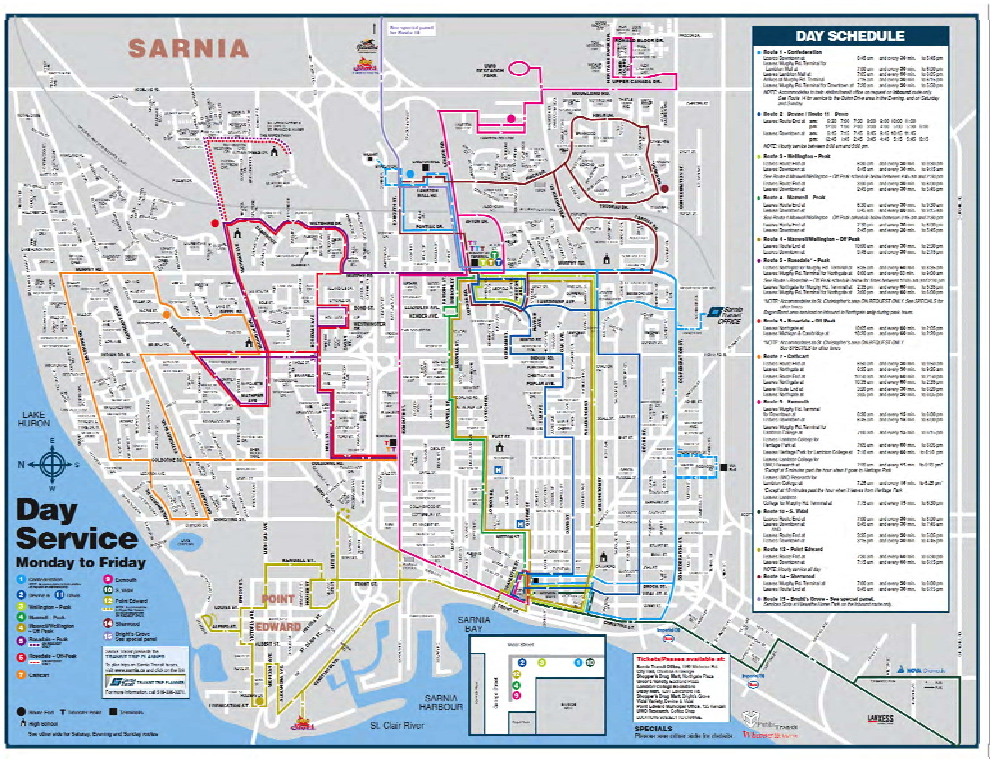
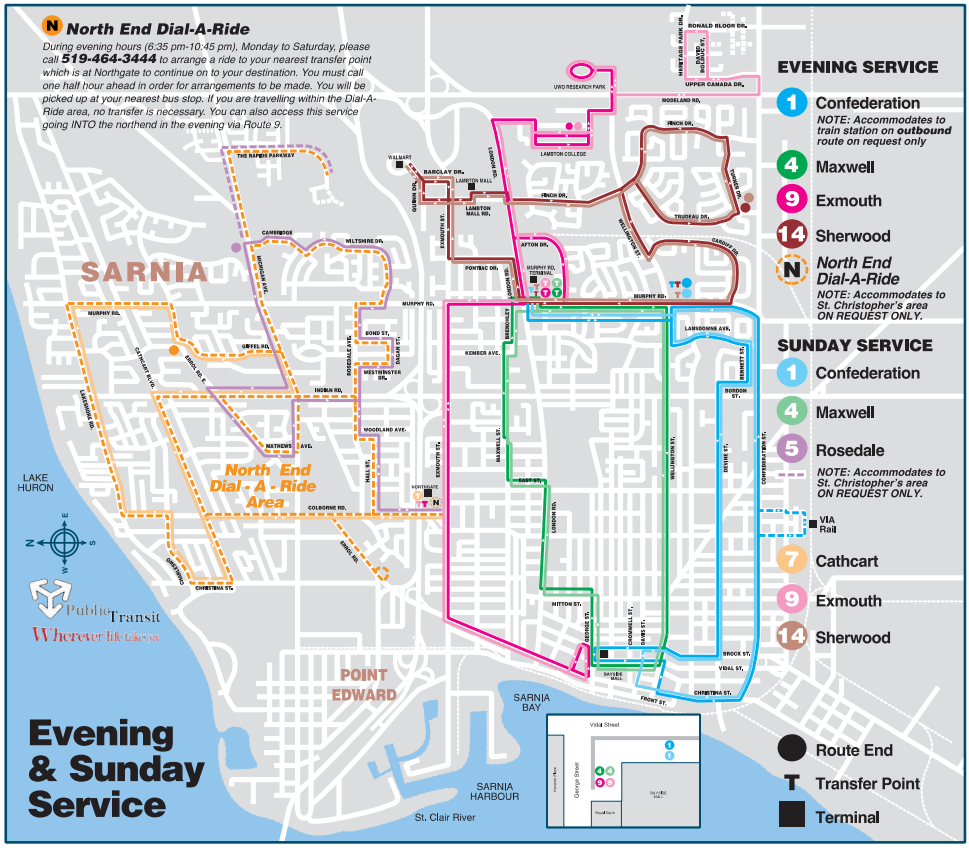


Exhibit 2-2: Saturday Day Service Network

Exhibit 2-3: Evening and Sunday Route Network



Transit Budget

The annual investment by the City in its conventional transit operations (excluding debt servicing and reserve allocation) for 2012 was $3,071,576 as summarized below.

Exhibit 2-4: Conventional Transit Budget Summary

Budget Category	Total
Revenue	
Fares	$1,462,260
Other	$467,651
Gas Tax	$219,250
Total	$2,149,161
Expenditures	
Transportation	$3,269,130
Fuel	$584,655
Vehicle Maintenance	$601,745
Plant & Premises	$176,606
General/Administration	$588,601
Total	$5,220,737
Net Municipal Investment	$3,071,576
Ridership	1,306,320
Revenue-hours	58,672
Revenue-kilometres	1,362,452

The transportation function (bus operator wages and related expenses) accounts for 62.6% of the budget. Fuel accounts for 11%, vehicle maintenance 11.5% and general/administration, the balance or 14.9%. These percentages are typical of a transit service although vehicle maintenance costs are marginally lower than average.

Revenue Sources

Fares

Transit fares are part of a comprehensive “Fees for Service” budget table that is considered and approved annually by City Council. The fares and rates form the basis for the Transit Department’s revenue projections for its annual operating budget.

The current transit fare is based on a flat cash rate of $2.50 for all customers. A discount is offered with tickets and monthly passes as an incentive to encourage more frequent transit use. Tickets are available in sheets of 20 for $44.00 ($2.20 per ticket), an approximate 12% discount compared to the cash fare, while a calendar-based monthly pass is available at $66.00. The pass rate is equivalent to 30 trips per month multiplied by the single ticket rate. The monthly pass is good for an unlimited number of trips each month so that, in effect, the more the person uses transit the less their “per trip” cost becomes. Sarnia Transit calculates that the average monthly pass holder uses transit an average of 55

times per month which is consistent with the experience in other cities. Care-A-Van fares are the same.

Additional transit incentive packages and discounts are offered through various pass media including programs for students, the Blind and veterans as well as a program for businesses to provide discounted passes to employees.

Transfers are provided to cash and ticket-paying users as proof-of-payment when transferring from one route to another. The transfer is valid until the next connecting bus. Return trips on a transfer are not permitted.

The fare structure was adjusted on January 1, 2013 when cash fares were increased by 25 cents with corresponding increases to the other fare categories and fare media.

Exhibit 2-5: Sarnia Transit Fare Structure

Fare Category	Rate
Base: Cash Tickets (20) Monthly Pass	 $2.50 $44.00 $66.00
Semester – Elementary	$148.50
Semester - College	$165.00
Summer Savings (July/August)	$99.00
Blind (annual)	$27.50
Children < Age 5	Free
Veterans	Free
Support Person	Free
Employer Pass Discounts	10% to 25%

Charter Services

The City also charters (rents out) buses to groups and businesses at an hourly rate of $93.00 which includes the bus operator.

Bus and Shelter Advertising

The City receives revenues from the sale of advertising space on transit buses, shelters and benches. A total of $56,758 was received in 2012 from these sources. Transit department staff handle the sale and administration of the advertising space.

Maintenance Department Services

Periodically the maintenance department provides services to non-owned vehicles such as visiting tour charter coaches and intercity buses. Fees for a range of vehicle servicing and maintenance activities such as washing, cleaning,

fuelling and repairs, have been established. The maintenance department vehicle services activity produces a small annual income of approximately $2,000.

Poverty Reduction Program

Introduced in 2008, the City, through the transit department fare structure, provides a limited number of discounted transit fares for people on reduced income. The program is administered by the Inn of the Good Shepherd, a non-profit charity group. The 2012 discounts were as follows:

Category	Full Rate	Program Rate	Discount
Monthly Pass (standard)	$60.00	$40.00	$20.00
20-Ticket Sheet	$40.00	$25.00	$15.00
½ Sheet of Tickets	$20.00	$12.50	$7.50

The number of passes and tickets provided each month is 90 passes and 15 sheets respectively. This program was recently formalized on the basis of the established discount amounts for the monthly pass, 20-ticket sheet and ½ ticket sheet of $20.00, $15.00 and $7.50 respectively and in the established limited quantities of 90 passes per month and 15 sheets of tickets per month.

Transit Special Service Area

In 2003, City Council adopted a “Transit Special Service Area” By-law which both defines the area within which conventional transit service is provided and within which property taxes include the cost of transit. Properties outside of the defined “Transit Service Area” (TSA) do not pay taxes towards transit. The TSA represents a boundary of approximately 450 metres from a transit route. Effectively, this approach limits where conventional transit will be provided. It also has the effect of limiting the financial investment available for conventional transit. As a result, the population served by Sarnia Transit is 71,420. The TSA boundary and the concept of the TSA was last reviewed in 2009 and no change was made to the boundary or the By-law at that time. Care-A-Van service is not subject to this same limitation and is funded from the general levy.

There have been a number of requests to have transit service extended to areas outside the TSA but these have been declined. At the same time, most future development within the city is projected to occur outside the TSA such that a change to the TSA boundary will need to be considered. It may be appropriate, at that time, to revisit the purpose and benefit of having a separate service area for Transit. In concept, transit service should be available to all residents, subject to the application of approved transit service policies as detailed within this study, and all residents and property owners should contribute to the provision of public transit as a general benefit to the community. *As well, there is currently an inequity between the provision of and funding for specialized transit compared to conventional transit which may no longer be appropriate*.

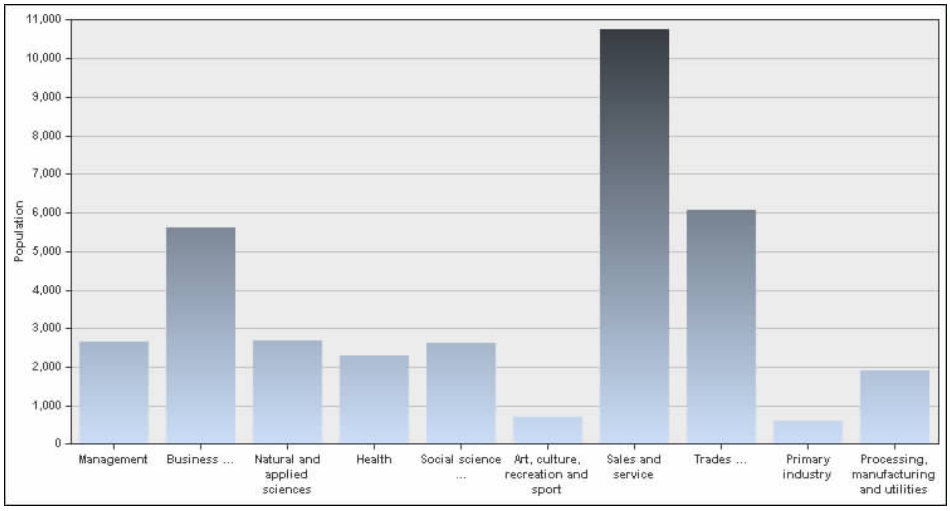
2.2 Urban Context

Sarnia's population, as reported by the 2011 census, is 72,355, and is the largest centre in Lambton County, which has a population of approximately 125,000. The Village of Point Edward has a population of 2,030. The combined service area population for Sarnia Transit is approximately 71,420[5] based on the TSA. Population in the city and its surrounding areas has remained stable over the past decade, increasing by about 3% from 2001. A recent influx of new residents related to the expansion of Lambton College has contributed to population growth. An overview of population and demographic trends is provided in Section 4.1.

Two-thirds of Sarnia's population, according to the 2006 census, reside in single-detached houses, which is the predominant housing type in both old and newer parts of the city. Most new housing being constructed on the periphery of the city is single-detached homes. However, there are a number of newer older adult communities featuring townhomes or semi-detached homes, in various parts of the city, reflecting changing demographics. The balance of the population resides in multiple unit dwellings, mostly in walk-up and high-rise apartment buildings. Major apartment areas include Exmouth/Colborne, Front Street, Errol/Christina, Sandy Lane, London/Russell, Wellington Street, and Devine Street. According to the 2006 census, 30% of Sarnia's population resided in rented dwellings.

The 2006 census indicated over 34,000 workers in Sarnia across a range of industries, the largest of which include sales and service and general trades. Industrial employment, particularly in relation to the petro-chemical and refining sectors, remains a major component of the city's employment.

Exhibit 2-6: Employment by Sector, 2006 Census



Major employers in the city and Lambton County include Bluewater Health, NOVA Chemicals, Imperial Oil, LANXESS, and Suncor. Major employment nodes include Chemical Valley, Lambton College, Lambton Mall, and the OLG Point Edward Casino.

[5] CUTA Urban Transit Statistics report, 2012

There is a distinct and clear separation between residential and employment areas within the city, with few mixed-use centres outside of downtown and older “main streets” such as Ontario and Milton Streets. All industrial employment uses are located in the south end of the city, south of Confederation Street, which reflects the functional need to separate uses, such as petro-chemical facilities, from residential areas. New employment sectors, including bio-research and call centres, are located closer to residential areas and are focused around Lambton College and the University of Western Ontario Research Park. Office employment remains concentrated in the downtown.

The retail landscape of Sarnia reflects overall retail trends in urban centres across North America over the past 25 years. The downtown’s prominence as the retail centre of the city has been substantially reduced as suburban retail plazas have been developed. Northgate represented the first migration of retail, followed by the development of Lambton Mall. More recently, retail activity has been primarily focused in the vicinity of Exmouth Street and Lambton Mall Road particularly after the relocation and expansion of Walmart in a new big-box centre at Highway 402 and Modeland Road. This, coupled with the expansion of Lambton Mall, has led to the decline of older retail nodes at Murphy Road and Northgate. Bayside Mall in downtown Sarnia, developed by Eaton’s in the 1980s, sits mostly vacant. However, downtown Sarnia remains a niche retail location for smaller boutiques, galleries, cafes, and restaurants. Further detail on growth patterns, development areas, and travel patterns is provided in Section 4.3.

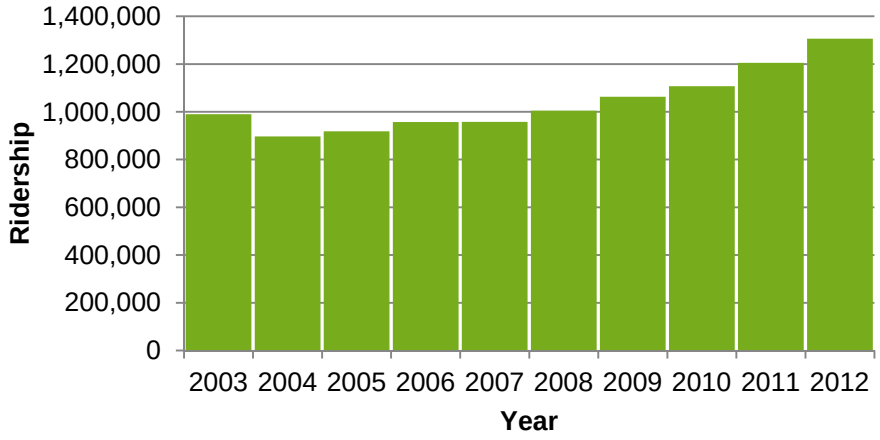
3. Transit System Assessment

This chapter provides an assessment of the conventional transit service including a review of ridership levels and trends, a peer review and a review of the City's existing transit service standards.

3.1 Ridership

Sarnia Transit ridership has increased over the past several years, reflecting similar trends in transit ridership across the country. Between 2004 and 2012, ridership increased by over 30%, with approximately 1.3 million rides taken in 2012. The increase in ridership has occurred while population in Sarnia has remained stable over the past decade and despite downturns in the local and regional economy. Changing demographics, increased cost of car ownership, an increase in the student population at Lambton College, particularly the influx of international students, have contributed to ridership gains, particularly on routes serving the college and areas where students are residing. Much of this growth has occurred without significant increases in capacity or changes in route structure.

Exhibit 3-1: Annual Ridership 2003-2012



One of the key measures of system ridership is rides per capita, represented by total ridership per population served. In 2011, Sarnia Transit served approximately 17 rides per capita, which is below both the national average for its population group (22 rides per capita) and that of its peer group[6] (27 rides per capita). The increase in ridership in 2012 raised the rides per capita to 17.6. Systems with higher rides per capita provide a higher level of service than Sarnia, as measured by service hours per capita. Most peer systems, however, also experienced greater population and employment growth over recent years.

[6] A peer group was identified for the purposes of a peer analysis, which is detailed in Section 3.3. Peer group members include Fredericton, Lethbridge (Alberta), Niagara Falls, North Bay, Peterborough, and Sault Ste. Marie

3.2 Performance Measures

Exhibit 3-2 provides an overview of key system performance measures for Sarnia Transit, based on 2012 statistics, providing an insight to overall service levels and operating costs and revenues and show:

- Revenue hours per capita at Sarnia Transit of approximately 0.79 hours per capita, which is below population group and peer average;
- Operating costs of approximately $5.2 million, offset by fare revenue of approximately $1.5-million, representing an operating revenue-cost ratio of 28%. This is below the target of 40% identified in the 2000 Sarnia Transit Operational Review;
- System-wide average speed of approximately 23.2kph is high and can impact on-time performance and service reliability;
- Cost per revenue service hour of $88.98; and
- An overall municipal operating contribution per capita of $41.28.

Section 3.3 provides a more comprehensive review of these performance measures as they relate to Sarnia Transit's peer group, giving insight on how the system compares to peer averages.

Exhibit 3-2: Overall System Performance Measures, 2012

Measure	2012 Statistics
Population Served (TSA)	71,420
Ridership	1,306,320
Rides per Capita	17.6
Revenue Service Hours	58,672
Revenue Hours per Capita	0.79
Operating Costs	$5,220,737
Fare Revenue	$1,462,260
Total Revenue	$2,149,161
Net Operating Cost	$3,071,576
Operating Revenue-Cost Ratio	28%
Average Speed (kph)	23.2
Cost per Revenue Service Hour	$88.98
Municipal Operating Contribution per Capita	$41.28

3.3 Peer Review

This section reviews transit services in various Canadian municipalities of similar size to Sarnia which can be considered Sarnia's "peers". A direct comparison between any of the municipalities is not intended or advisable as every municipality has its own characteristics and dynamics. Instead, the value of this peer review is to understand what is being done in other municipalities, to review the operating characteristics of those transit services, and to assess how Sarnia Transit compares to the other municipalities.

For the purpose of this review, Sarnia's peer transit systems are:

- Brantford, ON
- Fredericton, NB
- Lethbridge, AB
- Niagara Falls, ON
- North Bay, ON
- Peterborough, ON
- Sault Ste. Marie, ON

Exhibits 3-3, 3-4 and 3-5 present the details and data on these transit operations along with those for Sarnia. The data is based on the 2011 Canadian Urban Transit Association statistics, the most recent available from all peer municipalities. As a result, statistics presented here for Sarnia may be different from those presented elsewhere in this report which utilizes 2012 statistics.

The information for these municipalities is grouped into two categories:

- **General characteristics** present information describing the municipal systems such as population served, type of operation, hours of service, fares and ridership; and

- **Performance indicators**, which present operational measures taking into account the population of the community and ridership. These include ridership per capita, and costs per vehicle hours and per capita.

Average values are based on the seven peer municipalities, excluding Sarnia data, unless otherwise noted.

Exhibit 3-3 presents a general summary of the peer statistics with an indication of Low, High and Average performance for the peer group and compares them to Sarnia.

Exhibit 3-3: General Characteristics

Criteria	Sarnia	Low	High	Average (excl. Sarnia)	Notes
Service Area Characteristics					
Municipal Population	**71,919**	54,000 North Bay	93,650 Brantford	73,046	
Population Served	**71,919**	49,000 North Bay	93,650 Brantford	73,946	
Fleet and Routes					
Total Active Vehicles	**23**	21 North Bay	49 Peterborough	33	Fewer vehicles reflecting less service
Percentage Accessible Fleet	**91%**	61% Fredericton	100% Brantford	80%	
Fixed Routes	**13**	8 Fredericton	16 Peterborough	12	
Employees					
Full-Time	**49**	37 Fredericton	92 Lethbridge	64	Fewer staff reflect less service
Part-Time	**6**	0 North Bay	30 Peterborough	12	
Full-time Equivalent Employees per Capita	**0.72**	0.72 Sarnia	1.13 Sault Ste. Marie	0.96	
Ridership and Service Levels					
Annual ridership	**1,205,429**	1,205,429 Sarnia	3,181,400 Peterborough	1,895,287	Below average
Revenue Service Hours	**52,649**	36,000 Fredericton	115,414 Lethbridge	78,523	Below average
Operating Expenses and Revenues					
Total Operating Cost	**$5,117,273**	$4,360,237 Fredericton	$9,699,910 Lethbridge	$7,538,186	
Total Passenger Revenues	**$1,451,273**	$1,451,273 Sarnia	$4,156,300 Peterborough	$2,681,787	
Fares					
Adult Cash Fare	**$2.25**	$2.25	$2.50	$2.36	Consistent with peers
Adult Monthly Pass	**$60.00**	$55.00 Peterborough	$80.00 North Bay	$66.29	Consistent with peers

Performance Indicators

Exhibit 3-4 shows key indicators for measuring transit performance taking into account the population of the community, the level of service and fare, and are derived from the foregoing information.

Exhibit 3-4: Performance Indicators

Criteria	Sarnia	Low	High	Average (excl. Sarnia)	Notes
Service Characteristics					
Revenue Service Hours per Capita	**0.73**	0.64 Fredericton	1.33 Peterborough	1.06	Lower than average
Average Speed (km/h)	**24.07**	17.65 Peterborough	24.07 Sarnia	22.36	Higher than average, potential service reliability problems
Service Utilization					
Annual Passengers per capita	**16.76**	16.19 Brantford	39.77 Peterborough	26.63	Below average – potential for increase
Passengers per Revenue Service Hour	**22.90**	15.87 Lethbridge	37.50 Fredericton	25.53	Below average
Financial Characteristics					
Cost Per Revenue Service Hour	**$97.20**	$83.88 Peterborough	$116.61 Niagara Falls	$99.65	At average
Average Fare	**$1.20**	$1.14 Sault Ste. Marie	$1.83 Sarnia	$1.44	Below average
Revenue-Cost Ratio	**34%**	28% Lethbridge	56% North Bay	38%	At average
Direct Cost per Passenger	**$4.25**	$2.81 Peterborough	$5.52 Brantford	$4.15	At average
Net Cost per Passenger	**$2.69**	$1.34 North Bay	$3.83 Lethbridge	$2.52	At average
Municipal Operating Contribution per Capita	**$38.04**	$38.04 Sarnia	$71.50 Lethbridge	$51.74	Below average

Exhibit 3-5: 2011 Service and Performance Characteristics of Peer Transit Systems

		Sarnia	Brantford	Fredericton	Lethbridge	Niagara Falls	North Bay	Peterborough	Sault Ste. Marie	Average (w/o Sarnia)	Average (w/ Sarnia)
Service Characteristics											
Municipal Population		71,919	93,650	56,000	89,074	85,000	54,000	80,000	74,200	73,046	75,989
Service Area Population		71,919	93,650	56,000	89,074	80,000	49,000	80,000	69,900	73,946	73,693
Service Area Size (Sq.Km.)		167.3	75.1	132.0	124.3	80.9	314.9	66.9	223.5	145.4	148.1
Employee Statistics											
Bus Operators	FT	33	43	27	65	33	44	54	55	46	44
	PT	6	12	15	3	12	-	21	-	9	9
Other Transp. Oper.	FT	-	7	-	4	4	2	3	3	3	3
	PT	-	-	-	-	2	-	6	-	1	1
Veh. Maintenance	FT	4	8	3	8	7	-	7	9	6	6
	PT	-	-	-	-	-	-	-	-	-	-
Other Veh. Maint. & Ser	FT	5	2	2	8	7	-	5	3	4	4
	PT	-	3	-	1	-	-	1	-	1	1
Plant & Other Maintenai	FT	-	-	-	-	1	-	-	2	0	0
	PT	-	-	-	-	-	-	-	2	0	0
General & Administratic	FT	7	3	5	7	4	2	4	4	4	5
	PT	-	-	-	1	-	-	2	4	1	1
	Total Employees (FT)	49	63	37	92	56	48	73	76	64	62
	Total Employees (PT)	6	15	15	5	14	-	30	6	12	11
	FTE per 1,000 capita	0.72	0.75	0.79	1.06	0.79	0.98	1.10	1.13	0.94	0.92
	FTE per Active Veh.	2.26	2.27	1.59	2.20	2.42	2.29	1.80	2.63	2.17	2.18
Number of Fixed Routes		13	14	8	13	14	11	16	10	12	12
	Routes per 1,000 capita	0.18	0.15	0.14	0.15	0.18	0.22	0.20	0.14	0.17	0.17
	Routes per Active Veh.	0.57	0.45	0.29	0.30	0.54	0.52	0.33	0.33	0.39	0.41
Vehicles											
Active Vehicles:	Light Rail Vehicles		-								-
	Standard Buses	18	31	27	40	26	21	49	29	32	30
	Articulated/Double Decker Buses		-				-			-	-
	Small Community Buses	5	-	1	3	-			1	1	2
	Total Active Vehicles	23	31	28	43	26	21	49	30	33	31
	Percentage of Accessible Transit Fleet	91%	100%	61%	93%	62%	90%	69%	83%	80%	81%
Ridership											
Ridership (Revenue Passengers)		1,205,420	1,515,929	1,350,000	1,831,090	1,518,397	1,879,607	3,181,400	1,990,583	1,895,287	1,809,053
Revenue Vehicle Kilometres		1,267,261	1,756,585	1,000,000	2,702,704	1,611,660	1,263,199	1,883,000	1,767,281	1,712,061	1,656,461
Revenue Vehicle Hours		52,649	76,149	36,000	115,414	68,643	63,482	106,700	83,272	78,523	75,289
Operating Revenue											
Regular Service Passenger Revenue		$ 1,451,723	$ 2,767,867	$ 1,697,238	$ 2,432,549	$ 2,371,741	$ 3,076,569	$ 4,156,300	$ 2,270,247	$ 2,681,787	$ 2,528,029
Total Operating Revenue		$ 1,723,219	$ 2,943,143	$ 1,776,311	$ 2,685,035	$ 2,463,901	$ 3,157,679	$ 4,181,900	$ 2,449,035	$ 2,808,143	$ 2,672,528
Total Revenue		$ 1,878,791	$ 3,048,263	$ 1,776,311	$ 2,685,035	$ 3,579,637	$ 3,161,327	$ 4,207,500	$ 2,461,921	$ 2,988,571	$ 2,849,848
Operating Expenses											
	Transportation Operations	$ 3,083,999	$ 4,108,852	$ 2,165,743	$ 6,009,426	$ 3,587,535	$ 3,007,591	$ 5,678,700	$ 4,030,349	$ 4,084,028	$ 3,959,024
	Fuel/Energy Exp. For Vehicles	$ 647,305	$ 1,093,241	$ 830,644	$ 1,264,356	$ 942,867	$ 932,670	$ 1,307,200	$ 925,590	$ 1,042,367	$ 992,984
	Vehicle Maintenance	$ 634,979	$ 1,606,545	$ 855,460	$ 1,708,550	$ 2,919,438	$ 1,194,620	$ 860,700	$ 1,488,328	$ 1,519,092	$ 1,408,578
	Plant Maintenance	$ 163,510	$ 1,518,883	$ 104,873	$ -	$ 194,902	$ 148,335	$ 720,400	$ 516,211	$ 457,658	$ 420,889
	Genera/Administration	$ 587,480	$ 45,057	$ 403,517	$ 717,578	$ 359,563	$ 402,525	$ 382,500	$ 734,554	$ 435,042	$ 454,097
	Total Direct Operating Expenses	$ 5,117,273	$ 8,372,578	$ 4,360,237	$ 9,699,910	$ 8,004,305	$ 5,685,741	$ 8,949,500	$ 7,695,032	$ 7,538,186	$ 7,235,572
	Net Cost/Capita	$ 45.03	$ 56.85	$ 46.14	$ 78.75	$ 55.31	$ 51.52	$ 59.28	$ 74.87	$ 60.39	$ 58.47
Performance Indicators											
Financial											
	Total Oper. Rev. / Total Dir. Oper. Exp (R/C Ratio)	34%	35%	41%	28%	31%	56%	47%	32%	38%	38%
	Municipal Operating Contribution / Capita	$ 38.04	$ 48.44	$ 46.14	$ 71.50	$ 51.04	$ 41.11	$ 42.40	$ 61.57	$ 51.74	$ 50.03
	Net Dir. Oper. Cost / Reg. Serv. Pass.	$ 2.69	$ 3.51	$ 1.91	$ 3.83	$ 2.91	$ 1.34	$ 1.49	$ 2.63	$ 2.52	$ 2.54
Average Fare											
	Reg. Serv. Pass. Rev. / Reg. Serv. Pass.	$ 1.20	$ 1.83	$ 1.26	$ 1.33	$ 1.56	$ 1.64	$ 1.31	$ 1.14	$ 1.44	$ 1.41
Cost Effectiveness											
	Tot. Dir. Oper. Exp. / Reg. Serv. Pass.	$ 4.25	$ 5.52	$ 3.23	$ 5.30	$ 5.27	$ 3.02	$ 2.81	$ 3.87	$ 4.15	$ 4.16
Service Utilization											
	Reg. Serv. Pass. / Capita	16.76	16.19	24.11	20.56	18.98	38.36	39.77	28.48	26.63	25.40
	Reg. Serv. Pass. / Rev. Veh. Hr.	22.90	19.91	37.50	15.87	22.12	29.61	29.82	23.90	25.53	25.20
Amount of Service											
	Rev. Veh. Hrs. / Capita	0.73	0.81	0.64	1.30	0.86	1.30	1.33	1.19	1.06	1.02
Average Speed											
	Rev. Veh. Kms. / Rev. Veh. Hr.	24.07	23.07	27.78	23.42	23.48	19.90	17.65	21.22	22.36	22.57
Labour Productivity											
	Rev. & Aux. Rev. Veh. Hrs. / Oper. Paid Hr.	0.69	0.60	0.63			1.00	0.64	0.78	0.73	0.72
Top Wage Rates											
	Operators	$ 23.84	$ 24.11	$ 21.00	$ 25.60	$ 25.11	$ 23.26	$ 24.95	$ 22.76	$ 23.83	$ 23.83
Cost per Rev. Vehicle Hour											
	Tot. Dir. Oper. Exp. / Rev. Hrs.	$ 97.20	$ 109.95	$ 121.12	$ 84.04	$ 116.61	$ 89.56	$ 83.88	$ 92.41	$ 99.65	$ 99.35
Vehicle & Maintenance											
Vehicle Maint. Operating Expense											
	$ Veh. Maint. Oper. Exp. / FTE staff	$ 12,211.13	$ 22,787.87	$ 19,223.82	$ 18,079.89	$ 46,340.29	$ 24,887.92	$ 9,780.68	$ 18,839.59	$ 22,848.58	$ 21,518.90
	$ Veh. Maint. Oper. Exp. / Rev. Veh. Hr.	$ 12.06	$ 21.10	$ 23.76	$ 14.80	$ 42.53	$ 18.82	$ 8.07	$ 17.87	$ 20.99	$ 19.88
	$ Veh. Maint. Oper. Exp. / Act. Vehicle	$ 27,607.78	$ 51,824.03	$ 30,552.14	$ 39,733.72	$ 112,286.08	$ 56,886.67	$ 17,565.31	$ 49,610.93	$ 51,208.41	$ 48,258.33
Operating Expense per Active Vehicle											
	Operations $ / Act. Veh	$ 134,087	$ 132,544	$ 77,348	$ 139,754	$ 137,982	$ 143,219	$ 115,892	$ 134,345	$ 125,869	$ 126,896
	Fuel/Energy Exp. For Vehicles / Act. Veh.	$ 28,144	$ 35,266	$ 29,666	$ 29,404	$ 36,264	$ 44,413	$ 26,678	$ 30,853	$ 33,220	$ 32,586
	Plant Maint. / Act. Veh.	$ 7,109	$ 48,996	$ 3,745	$ -	$ 7,496	$ 7,064	$ 14,702	$ 17,207	$ 14,173	$ 13,290
	G&A / Act. Veh.	$ 25,543	$ 1,453	$ 14,411	$ 16,688	$ 13,829	$ 19,168	$ 7,806	$ 24,485	$ 13,977	$ 15,423
	Total Oper. Exp. / Act. Veh.	$ 222,490	$ 270,083	$ 155,723	$ 225,579	$ 307,858	$ 270,750	$ 182,643	$ 256,501	$ 238,448	$ 236,453
Operating Expense per Rev. Hr.											
	Operations $ / Rev. Hrs.	$ 59	$ 54	$ 60	$ 52	$ 52	$ 47	$ 53	$ 48	$ 52	$ 53
	Fuel/Energy Exp. For Vehicles / Rev. Hrs.	$ 12	$ 14	$ 23	$ 11	$ 14	$ 15	$ 12	$ 11	$ 14	$ 14
	Plant Maint. / Rev. Hrs.	$ 3	$ 20	$ 3	$ -	$ 3	$ 2	$ 7	$ 6	$ 6	$ 6
	G&A / Rev. Hrs.	$ 11	$ 1	$ 11	$ 6	$ 5	$ 6	$ 4	$ 9	$ 6	$ 7
	Total Oper. Exp. / Rev. Hrs.	$ 97	$ 110	$ 121	$ 84	$ 117	$ 90	$ 84	$ 92	$ 100	$ 99

Analysis of Peer Performance

Transit ridership is influenced heavily by several factors, including:

- The amount of service provided, usually measured by revenue service hours (RSH);
- the ability of the network to meet travel needs, measured by service utilization; and
- demographic and market conditions, and, to a lesser extent, fare rates.

Within the context of the peer review, the following are the key conclusions concerning Sarnia Transit's performance.

Sarnia operates fewer service hours compared to its peers; consequently, it has significantly fewer riders per capita.

Compared to its peers, Sarnia Transit provides a lower level of service with fewer revenue service-hours per capita. With only 0.73 revenue service hours per capita, the system provides approximately 15% fewer hours than the peer average of approximately 1.0 revenue service hours per capita. As there is a direct relationship between the level of service and ridership, the low level of service contributes to the relatively low ridership, with only 16.8 riders per capita, compared to the peer average of 25.4.

The cost of operating transit in Sarnia is consistent with the average of its peers.

While providing a lower level of service, Sarnia does operate its service at a cost that is comparable to its peers. Sarnia's average cost per revenue service hour is $97.20, slightly lower than the average of $99.35. The marginal direct cost per revenue service hour, which excludes general administration and plant/maintenance expenses, in Sarnia is $82.93, which is in line with the average of $84.63. The system's revenue-cost ratio of 34% is slightly below the average of 38%.

Service utilization in Sarnia is below its peers, indicating that it may not meet travel needs. Restructuring service has potential to increase ridership to peer averages.

A key measure of system performance is service utilization, which is the number of passengers per hour of service operated. Sarnia's service utilization rate of 22.9 passengers per revenue-hour is marginally below the peer average of 25.5 passengers per revenue hour. This means that existing services may not reflect the travel needs and patterns of transit customers or that services are provided when not necessary.

High average speeds create challenges to maintaining on-time performance and service reliability.

Compared to its peers, Sarnia Transit has the highest system average speed of approximately 24.7 km/h, with the peer average at 22.6 km/h. Higher average speeds are common with smaller transit systems, resulting from extended routes (without a corresponding increase in running time), lower ridership levels and less traffic congestion. However, there is a limit to how far smaller transit systems can push their operating speeds before system reliability and on-time performance is compromised. Generally, an average speed of 22 km/h is the upper limit for most routes although increased ridership and expanded use of mobility devices will lead to lower overall speeds. Further, the transit system design of multiple terminals and transfer points, such as the Northgate Mall, and diversions into the mall, adds pressure to route running times.

A high average speed also makes it difficult to adequately serve people with disabilities particularly those using wheelchairs and scooters, as the statistic is an indication of limited running time to accommodate prolonged stops.

Transit ridership has increased at a higher rate than peers but without significant changes to network

Sarnia has recently experienced a high rate of transit ridership growth of 9% between 2010 and 2011, the highest rate amongst its peers. Only Fredericton and Brantford experienced similar growth rates of 7%. This compares to an average growth rate between 2% and 4% for the other peers.

This growth has occurred without any significant changes to the transit network or added service, which may indicate external influences on ridership growth. Factors that may shift trips to transit include higher auto operating costs, changing demographics (such as immigration or an aging population), and challenging economic conditions. There is also anecdotal evidence of increased transit use by Lambton College students, one of Sarnia Transit's largest captive markets. However, sustaining or maintaining this growth rate will be a challenge considering the current route network design and related issues.

Under-investment in transit by municipal government is a key challenge for Sarnia.

Sarnia's key challenge for further increasing transit ridership is to convince decision-makers to increase municipal investment in public transit services. Currently, the municipal operating contribution per capita toward transit in Sarnia is the lowest, and significantly so, amongst its peers, at just $38.04. The average contribution per capita is $51.74.

The $13.70 per capita difference from the average in transit operating investment represents almost $1.0 million annually, or, based on the marginal direct service cost per revenue-hour, close to 12,000 revenue service-hours annually. An investment of this magnitude could substantially increase the level of service provided by Sarnia Transit and ridership and would better meet the mobility needs of the city.

Conclusions

The peer review analysis indicates the following conclusions regarding Sarnia Transit:

- Sarnia's level of municipal investment is lowest amongst its peers;
- Sarnia provides a lower level of transit service (revenue-hours) compared to its peers which reflects the level of investment by the City;
- Although increasing, Sarnia Transit ridership is low compared to its peers, reflective of existing service levels;
- Service utilization is below average, which is an indication that services may not be reflective of overall travel needs and patterns; and,
- Sarnia Transit's financial performance (revenue-cost ratio and cost per revenue-hour) is consistent with its peers which indicate that the service is being efficiently run.

3.4 Service Standards

In the last operational review completed for Sarnia Transit in 2000, two sets of service standards were developed around level of service and system performance. These standards are summarized below:

- **Level of Service** standards set out warrants for the provision of transit service within the service area and included:
  - Coverage of 90% of the city within a 400-metre walk of transit during peak periods;
  - Minimum provision of hourly bus service where provided, with an increase in service where ridership exceeds 8 revenue passengers per vehicle hour; and
  - Evening and Saturday service provided where average ridership exceeds 8 revenue passengers per vehicle hour.
- **System Performance** standards set out targets for ridership and overall system financial performance and include:
  - Routes achieve a minimum of 8 revenue passengers per vehicle hour; where not achieved, a reduction to 60-minute service would be considered; and
  - Overall system cost-ratio target of 40% each year.

In general, these service standards are consistent with those at other small to mid-sized transit systems across the country. In addition, they have generally been adhered to in the planning and operation of services in Sarnia subject to

the application of the Transit Service Area funding envelope. Over the years, existing routes have been extended to service new developments and destinations to achieve service coverage targets, high ridership routes have had increased service, and low ridership routes have had services scaled back such as in the north end of the City.

Level of Service

Level of service is reflected by both the span of service – when service is operated – and the frequency of service – how often service is provided. The level of service provided by route is influenced heavily by ridership, but also by the service standards (as indicated in Section 3.4).

Span of Service

Sarnia Transit operates service at different times of day:

- **Monday to Friday service** operates from approximately 6:30 a.m. to 11:00 p.m. Service changes over from daytime to evening service at approximately 6:30 p.m. Peak period service is provided approximately between 6:30 a.m. and 9:00 a.m. and 3:00 p.m. to 6:30 p.m.

- **Saturday service** operates from approximately 8:00 a.m. to 11:00 p.m. Evening service begins at approximately 6:30 p.m.

- **Sunday service** operates from approximately 8:30 a.m. to 6:30 p.m. No evening service is provided on Sundays.

Service does not operate on most statutory holidays, with the exception of Canada Day, where special bus service is provided, and Easter Monday (a non-statutory holiday). Evening service is not provided on Christmas Eve and a special schedule is provided on New Year's Eve. This is consistent with most small- to mid-sized transit systems across the country.

During peak periods, a modified route structure is operated:

- Two peak-only routes, Route 3 WELLINGTON and Route 10 SOUTH VIDAL operate, and modified service is provided on Route 5 ROSEDALE;

- Route 3 operates to provide two-way service on Wellington Street; two-way service is therefore also provided on Route 4 MAXWELL;

- Route 5 ROSEDALE also operates on a modified route during peak periods and is extended to Murphy Road Terminal and operates in both directions along most of the route; and

- Route 10 SOUTH VIDAL provides service between the downtown terminal and Chemical Valley.

In addition, two trips are provided on the PLANT EXPRESS between Chemical Valley and the Murphy Road Terminal.

The utilization of different route structures between peak and off-peak periods contribute to the difficulty of understanding of transit service in Sarnia. During off-peak periods, routes continue serving most corridors; however, they may not serve stops in a direction served during peak periods. Although the different route structures reduce operating costs, it also creates confusion and makes transit less attractive in these corridors outside of peak periods.

Frequency of Service

Most routes provide daytime service of 30 minutes or better from Monday to Saturday. The service with the most frequent service is Route 9 EXMOUTH, which operates every 15 minutes throughout the day and links the three major terminals and transfer locations. The route also is the main route serving Lambton College as well as Northgate and the Exmouth corridor. Exhibit 3-6 provides an overview of service frequency by route and time of day.

Evening service operates from Monday to Saturday on five routes - Routes 1, 4, 9, 14, and 15. Service is provided every 30 minutes on these routes, with the exception of Route 15 BRIGHTS GROVE, on which only two late evening trips are provided. Also during the evenings, the north end of Sarnia is served by a dial-a-ride, or demand-responsive, service replacing fixed routes 5 and 7. Connections into the north end are provided at Northgate Terminal from Route 9 trips. Other trips are arranged by phone.

Saturday service on 9 routes during the day, same evening schedule, service generally same as during midday on weekdays, but with reduced service on Route 9. Sunday service during the day provides similar service to Monday to Friday evening service; however, Route 5 and 7 operate instead of north end dial-a-ride.

Exhibit 3-6: Service Headway by Route and Time of Day

Route	Weekday				Saturday		Sunday
	AM Peak	Midday	PM Peak	Evening	Day	Evening	Day
1 CONFEDERATION	30	30	30	30	30	30	30
2/11 DEVINE - DAVIS	30	60	30		60		
3 WELLINGTON (peak-only)	30		30				
4 MAXWELL	30	30	30	30	30	30	30
5 ROSEDALE	60	60	60	Dial-A-Ride	60	Dial-A-Ride	60
7 CATHCART	30	60	30		60		60
9 EXMOUTH HERITAGE PARK	15	15	15	30	30	30	30
10 SOUTH VIDAL (peak-only)	30		30				
12 PT EDWARD	60	60	60		60		
14 SHERWOOD	30	30	30	30	30	30	30
15 BRIGHTS GROVE	5 trips	5 trips	5 trips	4 trips	10 trips	4 trips	12 trips

Revenue-Hours

Another measure of level of service is revenue service hours, or the overall sum of hours buses operate on a particular route or system. Approximate revenue hours by route and time of day are provided in Exhibit 3-7, which indicates that the bulk of service hours in the system are concentrated on four key routes: Route 1 CONFEDERATION, Route 4 MAXWELL, Route 9 EXMOUTH, and Route 14 SHERWOOD. These service hours are reflective of the higher frequency of service and longer span of service on these routes, and, as indicated ridership counts (Section 3.6), result in higher ridership.

Ridership per revenue-hour is an important measure of how well a route is used and this forms part of the system's service standards. Analysis of this measure by route is provided in the next section.

Exhibit 3-7: Revenue Service-Hours by Route and Time of Day

Route	Weekday					Saturday			Sunday
	AM Peak	Midday	PM Peak	Evening	Total	Day	Evening	Total	Total
1 CONFEDERATION	4.5	12.0	7.0	4.5	28.0	10.5	4.5	15.0	10.0
2/11 DEVINE - DAVIS	1.3	3.0	1.8		6.0	5.3		5.3	
3 WELLINGTON (peak-only)	2.5		3.5		6.0				
4 MAXWELL	2.5	6.0	3.5	4.5	16.5	10.5	4.5	15.0	10.0
5 ROSEDALE	3.0	3.0	3.5		9.5	5.3		5.3	5.0
7 CATHCART	2.5	3.0	3.8		9.3	5.0		5.0	4.8
9 EXMOUTH HERITAGE PARK	10.0	24.0	15.0	9.5	58.5	21.5	9.5	31.0	20.0
10 SOUTH VIDAL (peak-only)	1.5		2.3		3.8				
12 PT EDWARD	0.9	3.0	1.9		5.8	5.3		5.3	
14 SHERWOOD	2.3	6.0	3.5	4.8	16.5	11.0	4.8	15.8	10.0
15 BRIGHTS GROVE	3.0	2.0	3.0	2.0	10.0	7.0	2.0	9.0	7.0

3.5 Route Ridership

Observed Ridership

In November 2012 and again in late January 2013, Sarnia Transit conducted trip-by-trip ridership counts on all its routes over a two-week period. These counts were averaged and extrapolated to provide an overview of ridership by period and route for the system and are presented in Exhibit 3-8.

Busiest Routes

Route 9 EXMOUTH-HERITAGE PARK is the busiest route, reflecting higher levels of service and its role as a major trunk route that provides connections to other routes at each of the city's three transit terminals. An average of approximately 2,100 daily boardings were observed on the route, with about half of these occurring during the morning and afternoon peak periods. High ridership is also observed on Saturdays and Sundays, with approximately 1,070 and 500 daily boardings, respectively.

Route 1 CONFEDERATION is the second busiest route in the system on weekdays, resulting from a substantial number of riders that use the route to travel from the Murphy Road terminal to both Lambton Mall and the Walmart and retail areas on Quinn Drive. These shopping trips are reflected in the higher PM peak ridership, compared to AM peak ridership. **Route 14 SHERWOOD** serves the shopping area in the evening and on weekends. Evening and Sunday service ridership on Route 1 includes riders on Devine Street, which is served during the day by **Route 2 DEVINE**.

The next busiest routes are those that serve the Maxwell and Wellington Street corridors, with a combined ridership of approximately 780 per day on Routes 3 and 4. Route 3 WELLINGTON provides peak-only service to supplement Route 4 MAXWELL, resulting in two-way service along the corridor. Ridership on these corridors is driven by the older neighbourhoods surrounding downtown Sarnia and from higher density developments – apartments, townhomes, and seniors complexes – located along Wellington Street, London Road, and Maxwell Street. Route 3 and 4 also serve Bluewater Health at London Road and Russell Street, which was recently expanded and is the consolidation with the former Sarnia General Hospital at George and Mitton Streets (also served by Route 3 and 4).

Low Ridership Routes

Two of the routes with the lowest ridership serve the suburban communities in the north end – Route 5 ROSEDALE and Route 7 CATHCART. These routes travel in lower density neighbourhoods and also do not serve any major destinations. The routes were shortened in the late 1990s to connect to Route 9 at Northgate as a cost-savings measure, which worked with frequent service on Route 9 and, at the time, the presence of a major retail node. However, many stores here since have vacated for newer retail areas in the city's east end and the attractiveness of Northgate as a transit node has diminished. The low ridership is also a result of lower levels of service – Route 5 only has hourly service and both routes do not have regular evening service, which is provided by dial-a-ride. Approximately 35 boardings daily are observed on dial-a-ride services provided in evenings from Monday to Saturday.

Low ridership is also observed on Route 10 SOUTH VIDAL, which reflects the decline in employment in the Chemical Valley area and the challenges of serving low intensity industrial uses located far from residential areas. Approximately 15 passengers use the peak-only service. In the morning peak period, Route 10 is supplemented by PLANT EXPRESS, which operates from Murphy Road Terminal. An average of 5 boardings per day were observed on the PLANT EXPRESS, which operates 2 trips.

Ridership is also low on service contracted to the Village of Point Edward on Route 12, although service is provided only hourly. Approximately 125 boardings per weekday were observed; the lowest ridership amongst regularly scheduled routes in the system.

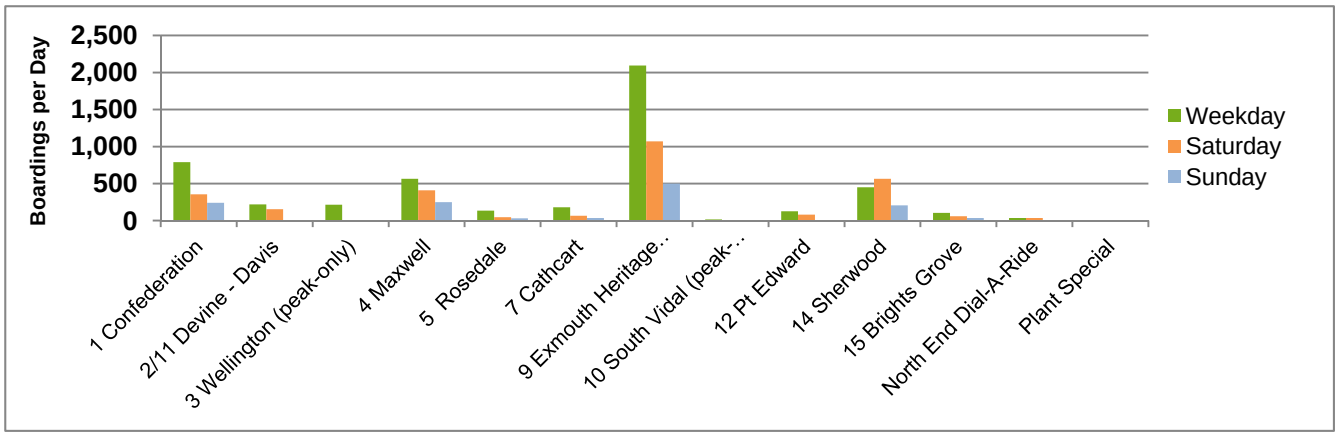
Service to Brights Grove is provided by Route 15, which provides limited service at specific times of the day, instead of regular 30- or 60-minute service on other routes. On weekdays, an average of 105 daily boardings were observed on 19 trips to or from Brights Grove. Fewer trips are provided on Saturday and Sunday, and is reflected in fewer daily boardings of 60 and 35, respectively.

Overall Analysis

Based on discussions with operators and transit staff, ridership has changed over recent years that reflect changes to travel patterns in Sarnia. For example, ridership on Lambton College routes has increased significantly as enrolment increases while ridership on routes serving Chemical Valley has decreased as employment declines. Similarly, shifting retail patterns has increased ridership in the new retail areas near Lambton Mall. Observed ridership patterns are consistent with these discussions.

Exhibit 3-8: Average Passenger Boardings by Route and Time of Day; November 2012 and January 2013 Counts

Route	Weekday					Saturday			Sunday
	AM Peak	Midday	PM Peak	Evening	Total	Day	Evening	Total	Total
1 CONFEDERATION	120	310	255	110	**790**	260	95	**355**	**240**
2/11 DEVINE - DAVIS	45	125	55		**220**	155		**155**	
3 WELLINGTON (peak-only)	115		105		**215**				
4 MAXWELL	95	265	105	100	**565**	305	105	**410**	**250**
5 ROSEDALE	50	45	45		**135**	45		**45**	**30**
7 CATHCART	60	65	65		**180**	65		**65**	**35**
9 EXMOUTH HERITAGE PARK	360	855	590	295	**2095**	775	295	**1070**	**500**
10 SOUTH VIDAL (peak-only)	5		10		**15**				
12 PT EDWARD	20	75	35		**125**	80		**80**	
14 SHERWOOD	85	185	100	85	**450**	465	100	**565**	**205**
15 BRIGHTS GROVE	25	30	40	15	**105**	50	10	**60**	**35**
North End Dial-A-Ride				35	**35**			**35**	
Plant Special	5				**5**				



Passengers per Revenue Service Hour

- While ridership is an easy measure to compare between routes, one of the more effective measurements of ridership is the number of riders per revenue service hour. A low value indicates that a route is not well utilized and service may need to be revised or reduced to either increase ridership or reduce costs. A value at or slightly above standard indicates a well-performing route. Where the value is significantly higher than standard, it is an indicator that the route is well utilized and may require additional service to meet demand. Sarnia Transit's route performance standards are heavily based on a standard of 8 riders per revenue hour at which service is either considered for increase or reduction.

Exhibit 3-9 presents the average passengers per revenue service hour by route and service period and shows that the majority of routes and service periods well exceed the system's standard of 8 passengers per revenue hour. Route 1 CONFEDERATION and Route 9 EXMOUTH-HERITAGE PARK show the most consistent value across all time periods, which reflect their role as the main spines of the transit network. Route 14 SHERWOOD also performs well, with the exception of evening and Sunday service, which reflects lower ridership on the route during these time periods.

One interesting data point is midday service on Route 2/11 DEVINE-DAVIS, which has ridership over 40 passengers per revenue hour. The route provides hourly service during the midday, which is very well utilized and reflects observations from operators and transit staff. The route is identified as a candidate for increased service; however, the route is currently interlined with Route 12 POINT EDWARD – any increase in service would be mirrored in Point Edward, which requires additional subsidy from the village. Options to revise both routes to meet service needs on Devine Street will be explored in later stages of the study.

There are four routes that have observed periods where the passengers per revenue hour fall below the system's standard of 8 passengers per revenue service hour:

- Route 10 SOUTH VIDAL performs poorly in both the AM and PM peak periods, reflecting low demand on the route servicing Chemical Valley;
- Routes 5 ROSEDALE and 7 CATHCART, which serve the city's north end, fall below standard on Sundays; and,
- Route 15 BRIGHTS GROVE falls below standard on weekday evenings, Saturdays, and Sundays. Midday and afternoon peak period is generally well utilized, but ridership may be limited by the schedule of the service.

Exhibit 3-9: Average Passengers per Revenue Service Hour

Route	Weekday				Saturday		Sunday
	AM Peak	Midday	PM Peak	Evening	Day	Evening	Day
1 Confederation	26.7	25.8	36.4	24.4	24.8	21.1	24.0
2/11 Devine - Davis	36.0	41.7	31.4		29.5		
3 Wellington (peak-only)	46.0		30.0				
4 Maxwell	38.0	44.2	30.0	22.2	29.0	23.3	25.0
5 Rosedale	16.7	15.0	12.9		8.6		6.0
7 Cathcart	24.0	21.7	17.3		13.0		7.4
9 Exmouth Heritage Park	36.0	35.6	39.3	31.1	36.0	31.1	25.0
10 South Vidal	3.3		4.0				
12 Pt Edward	22.9	25.0	18.7		15.2		
14 Sherwood	37.8	30.8	28.6	17.9	42.3	21.1	20.5
15 Brights Grove	8.3	15.0	13.3	7.5	7.1	5.0	5.0

3.6 Overall Observations

A field visit was conducted by project staff on May 14 and 15, 2013 and included on-vehicle observations on all fixed routes to gain a greater understanding of day-to-day operational constraints and opportunities. This included interaction with transit customers and staff. The observations also allowed for better analysis of the geography of the ridership counts that were provided on a trip-basis. The following is a summary of key observations and insights from this visit, which are supported by the operational and ridership analysis in this section.

- Sarnia Transit is well utilized throughout the day, with a diverse mix of customers. However, based on conversations with customers, most are captive riders – those who do not drive or have access to a vehicle or have mobility challenges. Nevertheless, most speak highly of the system and of the service it provides to them.

- Operators are proactive in meeting customer travel needs – many are aware of where “regular” customers need to go or where they board the bus and make efforts to accommodate them. The timed-transfer system is largely successful as a result of operators sending requests to one another to accommodate transfers. Operators were observed to assist customers without hesitation.

- It was observed that most routes have difficulty adhering to timing points and schedules. The need to accommodate timed transfers between routes at transfer locations creates a domino effect as on-time buses wait for late buses. This is reflected in the system’s overall average speed, which is an indication that restructuring may be necessary to right-size routes to meet operational needs.

- The timed transfer system results in duplicative service in areas that may benefit from more frequent service – for example, at Lambton Mall, routes that serve the mall all pass at the same time, as they all leave Murphy Road Terminal on the same schedule.

- Corridors with observed with heavy transit ridership include the Exmouth Street corridor, Wellington Street corridor, and Devine Street corridor. Route 2/11 are interlined; however, ridership on the DEVINE route much heavier than on the DAVIS route.

- Even outside of the regular post-secondary school year, there is significant ridership from Lambton College. It was observed that many customers boarding at Lambton College alighted at Murphy Road Terminal to transfer to other routes.

- The Murphy Road Terminal is over capacity at peak times but is reflective of its heavy use, with buses loading and unloading away from the platform. The Northgate Terminal serves a retail node that has decreased in importance after the departure of Sears from the Northgate Shopping Centre. It is not as well utilized, which is reflective of the level of service of the two routes (Route 5 and 7) that connect here.

- Current route structure does not recognize significant shift in travel and destinations resulting from the migration of retail centres from former nodes – Murphy Road and Northgate – to the Lambton Mall area and emerging large-format retail node centred on the Walmart on Quinn Drive.

- Multiple route structures – peak and non-peak, evening service – are confusing for non-regular users of the transit system, reflected in conversations with customers and through stakeholder consultation. Differences between peak and non-peak service are substantial. For example, travel times for customers on Maxwell and Wellington could potentially double due to unidirectional service.

- Areas with observed with low ridership include the neighbourhoods on the north end, Point Edward, and areas on the eastern periphery of the city, including Heritage Park and the UWO Research Park. Ridership to the Research Park dropped following the closure of the call centre.

The above findings reflect experience gained through on-board and on-street observations over a period of two days but reinforced by conclusions from ridership counts, discussions with operators and transit staff, consultation with stakeholders, and overall analysis of the built-form and development patterns.

3.7 System Analysis Summary

Exhibit 3-10 presents the summary of operational characteristics by route and time period, including a comparison of revenue and costs and reveals a number

of conclusions for both the overall system and individual routes that echo the analyses presented in previous sections.

The system has an overall revenue-cost ratio of 34% on weekdays, 30% on Saturdays, and 23% on Sundays. This is below the system standard of 40% set out in the service standards. Measures to increase the revenue-cost ratio will need to focus on increasing ridership and revenue, as opposed to reducing costs, as the service standards require a minimum provision of service coverage in the city.

The three routes with the lowest cost-recovery ratios, 10 SOUTH VIDAL, 15 BRIGHTS GROVE, and 5 ROSEDALE are struggling for three different reasons. Route 10 has seen ridership fall significantly as employment has decreased in Chemical Valley. Route 15 has moderate ridership that is reflective of the irregular schedule against higher costs due to the long travel distance. Route 5 travels through lower density residential areas and provides infrequent service that also requires transfers at Northgate.

Route 9 EXMOUTH-HERITAGE PARK operates with the highest cost recovery of 41% on weekdays, remaining consistent at 44% on Saturdays, and falling slightly on Sundays to 31%. This is reflective of the high ridership and its role as a major trunk route with high service frequency throughout the day. It also raises the question of how to accommodate heavy travel demand on this route and opportunities to leverage the success of the route to other lower performing services.

Sunday service, from a cost-recovery basis, is a success on the routes providing 30-minute service; however, is struggling where service is provided hourly. Similar results are observed on Saturdays. While unsurprising that ridership is lower on routes with less service, continued poor financial performance means other approaches, including restructuring of routes, may be needed.

Finally, the analysis shows that many routes have average speeds above 25 km/h, which creates challenges for on-time performance. This is a risk for a system where on-time performance is essential to coordinate timed transfers. Also, emerging accessibility and mobility needs on the conventional system will require additional running time.

Exhibit 3-10: Operating and Performance Statistics

Weekday Operating and Performance Statistics

ROUTE	DIST. (km)	HEADWAY (minutes) AM PK	MID DAY	PM PK	EVE	RUNNING TIME (minutes) AM PK	MIDDAY	PM PK	EVE	AVG. SPEED (kph)	VEHICLES AM PEAK	MID DAY	PM PEAK	EVE	REVENUE VEHICLE HOURS AM PEAK 3.0	MID DAY 5.0	PM PEAK 3.0	EVE 5.0	TOTAL 16.0	BOARDING PASSENGERS AM PEAK	MID DAY	PM PEAK	EVE	TOTAL	PASSENGERS / REV. VEH. HR AM PEAK	MID DAY	PM PEAK	EVE	TOTAL	REV. COST RATIO	FAREBOX REV. @ $1.10 Per Brdg	DIRECT COST @ $88.98 Per VSH
1. CONFEDERATION																															
DAYTIME	17.9	30	30	30		60	60	60		17.9	2.0	2.0	2.0		6.0	10.0	7.0	0.0	23.0	120	310	255		685	20	31	36		30	0.37	$ 756	$ 2,047
EVENING	13.4				30				30	26.8				1.0	0.0	0.0	0.0	5.0	5.0				110	110				22	22	0.27	$ 121	$ 445
2. DAVIS/11. DEVINE	14.6	30	60	30		30	30	30		29.2	1.0	0.5	1.0		3.0	2.5	3.0	0.0	8.5	45	125	55		225	15	50	18		26	0.33	$ 248	$ 756
3. WELLINGTON	10.7	30		30		30	30	30		21.4	1.0		1.0		3.5	0.0	3.5	0.0	7.0	115		105		220	33		30		31	0.39	$ 243	$ 623
4. MAXWELL	9.2	30	30	30	30	30	30	30	30	18.4	1.0	1.0	1.0	1.0	3.0	5.0	3.0	5.0	16.0	95	265	105	100	565	32	53	35	20	35	0.44	$ 624	$ 1,424
5. ROSEDALE																															
PEAK	20.8	60		60		60		60		20.8	1.0		1.0		3.5	0.0	4.0	0.0	7.5	50		45		95	14		11		13	0.16	$ 105	$ 667
OFF-PEAK	12.3		60				30			24.6		0.5			0.0	2.5	0.0	0.0	2.5		45			45		18			18	0.22	$ 50	$ 222
7. CATHCART	14.2	30	60	30		30	30	30		28.4	1.0	0.5	1.0		3.0	2.5	3.0	0.0	8.5	60	65	65		190	20	26	22		22	0.28	$ 210	$ 756
NORTH END DIAL-A-RIDE					30				30	0.0				1.0	0.0	0.0	0.0	5.0	5.0				30	30				6	6	0.07	$ 33	$ 445
9. EXMOUTH HERITAGE PARK	23.2	15	15	15	15	60	60	60	60	23.2	4.0	4.0	4.0	4.0	12.0	20.0	12.0	20.0	64.0	360	855	590	295	2100	30	43	49	15	33	0.41	$ 2,319	$ 5,695
10. SOUTH VIDAL	11.1	30		30		30		30		22.2	1.0		1.0		1.5	0.0	2.0	0.0	3.5	5		10		15	3		5		4	0.05	$ 17	$ 311
12. POINT EDWARD	14.6	60	60	60		30	30	30		29.2	0.5	0.5	0.5		1.5	2.5	1.5	0.0	5.5	20	75	35		130	13	30	23		24	0.29	$ 144	$ 489
14. SHERWOOD	11.3	30	30	30	30	30	30	30	30	22.6	1.0	1.0	1.0	1.0	3.0	5.0	3.0	5.0	16.0	85	185	100	85	455	28	37	33	17	28	0.35	$ 502	$ 1,424
15. BRIGHTS GROVE	35.1	6t	4t	5t	5t	60	60	60		35.1	1.0	1.0	1.0	1.0	3.0	2.0	2.5	2.5	10.0	25	30	40	15	110	8	15	16	6	11	0.14	$ 121	$ 890
Prepared by IBI Group May 2013										TOTAL SYSTEM	14.5	11.0	14.5	9.0	43.0	52.0	44.5	42.5	182.0	980	1,955	1,405	635	4,975	23	38	32	15	27	0.34	$ 5,493	$ 16,194

Saturday Operating and Performance Statistics

ROUTE	DIST. (km)	HEADWAY (minutes)		DAY	EVE	RUNNING TIME (minutes)		DAY	EVE	AVG. SPEED (kph)	VEHICLES AM PEAK	MID DAY	PM PEAK	EVE	REVENUE VEHICLE HOURS		DAY 10.5	EVE 4.5	TOTAL 15.0	BOARDING PASSENGERS		DAY	EVE	TOTAL	PASSENGERS / REV. VEH. HR		DAY	EVE	TOTAL	REV. COST RATIO	FAREBOX REV. @ $1.10 Per Brdg	DIRECT COST @ $88.98 Per VSH
1. CONFEDERATION	11.7			30	30			30	30	23.4			1.0	1.0			10.5	4.5	15.0			260	95	355			25	21	24	0.29	$ 392	$ 1,335
2. DAVIS/11. DEVINE	11.4			60				30		22.8			0.5				5.3	0.0	5.3			155		155			30		30	0.37	$ 171	$ 467
4. MAXWELL	9.6			30	30			30	30	19.2			1.0	1.0			11.5	4.5	16.0			305	105	410			27	23	26	0.32	$ 453	$ 1,424
5. ROSEDALE	12.3			60				30		24.6			0.5				5.3	0.0	5.3			45		45			9		9	0.11	$ 50	$ 467
7. CATHCART	14.2			60				30		28.4			0.5				5.3	0.0	5.3			65		65			12		12	0.15	$ 72	$ 467
NORTH END DIAL-A-RIDE					30				30	0.0				1.0			0.0	4.5	4.5				30	30				7	7	0.08	$ 33	$ 400
9. EXMOUTH HERITAGE PARK	23.2			30	30			60	60	23.2			2.0	2.0			21.0	9.0	30.0			775	295	1070			37	33	36	0.44	$ 1,181	$ 2,669
12. POINT EDWARD	14.6			60				30		29.2			0.5				5.3	0.0	5.3			80		80			15		15	0.19	$ 88	$ 467
14. SHERWOOD	13.2			30	30			30	30	26.4			1.0	1.0			10.5	4.5	15.0			465	100	565			44	22	38	0.47	$ 624	$ 1,335
15. BRIGHTS GROVE	35.1			60	60			60	60	35.1			1.0	1.0			10.5	4.5	15.0			50	10	60			5	2	4	0.05	$ 66	$ 1,335
Prepared by IBI Group May 2013										TOTAL SYSTEM	-	-	8.0	7.0	-	-	85.0	31.5	116.5	-	-	2,200	635	2,835			26	20	24	0.30	$ 3,130	$ 10,366

Sunday Operating and Performance Statistics

ROUTE	DIST. (km)	HEADWAY (minutes)		DAY		RUNNING TIME (minutes)		DAY		AVG. SPEED (kph)	VEHICLES AM PEAK	MID DAY	PM PEAK	EVE	REVENUE VEHICLE HOURS		DAY 10.0		TOTAL 10.0	BOARDING PASSENGERS		DAY		TOTAL	PASSENGERS / REV. VEH. HR		DAY		TOTAL	REV. COST RATIO	FAREBOX REV. @ $1.10 Per Brdg	DIRECT COST @ $88.98 Per VSH
1. CONFEDERATION	13.4			30				30		26.8			1.0				10.0		10.0			240		240			24		24	0.30	$ 265	$ 890
4. MAXWELL	9.6			30				30		19.2			1.0				11.0		11.0			250		250			23		23	0.28	$ 276	$ 979
5. ROSEDALE	12.3			60				30		24.6			0.5				5.0		5.0			30		30			6		6	0.07	$ 33	$ 445
7. CATHCART	14.2			60				30		28.4			0.5				5.0		5.0			35		35			7		7	0.09	$ 39	$ 445
9. EXMOUTH HERITAGE PARK	23.2			30				60		23.2			2.0				20.0		20.0			500		500			25		25	0.31	$ 552	$ 1,780
14. SHERWOOD	13.3			30				30		26.6			1.0				10.0		10.0			205		205			21		21	0.25	$ 226	$ 890
15. BRIGHTS GROVE	35.1			60				60		35.1			1.0				10.0		10.0			35		35			4		4	0.04	$ 39	$ 890
Prepared by IBI Group May 2013										TOTAL SYSTEM	-	-	7.0	-	-	-	71.0	-	71.0	-	-	1,295	-	1,295			18		18	0.23	$ 1,430	$ 6,318

3.8 Stakeholder Consultation

Stakeholder insights into opinions regarding the existing transit services, its role and value in the community and to determine future transit needs and expectations was invited through several methods and venues. This process included:

- A website with an attached survey on transit attitudes and use;
- Focus group sessions with invited community leaders;
- Meetings with transit employees;
- On-board transit vehicle and on-site observations and discussions with transit users; and
- A Public Information Centre meeting.

People invited to participate in the focus group session represented a broad cross-section of the transit stakeholders including members of the public, the Chamber of Commerce, business leaders, representatives of the college, transit users and seniors. A focus group is a valuable process for discussing specific issues in a controlled environment whereby participating members can hear other views and share their own.

The website and survey provided information about the broad TMP and Transit Master Plan studies and provided an opportunity for people to complete a survey.

The meetings with transit employees (office, supervisory and bus operating staff) were held at the transit offices during business hours and provided an opportunity for employees to ask questions and provide their insights into key issues and opportunities to improve Sarnia's transit services. These sessions were most valuable in helping the consulting team to understand both the community as well as important operational issues. The key objectives of these meetings and interviews were to discuss the purpose of the study, expected results, to obtain views on the stature and role of transit in the municipality, receive feedback from residents and identify key issues.

In addition to the above specific activities, additional insight was received through the Mayor and Council offices from residents who wrote letters and emails to express their views on transit needs in the community.

Stakeholder Comments

The opinions and future expectations received from Sarnia Transit stakeholders as a result of the meetings, discussions and survey are summarized below.

<u>Major Destination Points/Ridership Sources in the City:</u>

- Lambton College, Walmart/Lambton Mall.
- Downtown.

- Northgate/Exmouth (Colborne to Indian Rd).
- Confederation Street (work) and Devine.
- Wellington Street (lots of public housing so good transit use).

General Comments:

- Improved transit is important to the community; it provides mobility for residents and access to jobs.
- Need earlier/later service, better evening and Sunday service.
- Need more frequent service.
- Need better service to employment areas.
- General view that transit has been neglected; there is need for better transit service.
- Route network no longer reflects the travel needs of the city. Routes have become too convoluted. In particular, there is a need for a more north-south orientation in the route network.
- Need better service to the emerging mall area at Exmouth and Lambton Mall Road.
- Route timings are very tight. The number one customer complaint is poor schedule adherence with buses running late.
- Evening service/routes should be same as daytime.
- Need improved Sunday service.

Key Customer Complaints:

- Late buses/missed connections.
- Service not frequent enough.
- Not early/late enough.

Stops and Shelters:

- Too many stops, too close together.

Customer Information and Communication

- Need new route map. Current one out of date.
- Need info on stop locations, more schedule information posted at key locations.

Routes:

- Runs/route running times are tight. No ability to make service accessible and accommodate wheelchairs.
- Routes circuitous, not direct.
- Too many transfers – difficult for buses to connect, confusing to users, causes buses to run late.

- No north-south routes. All east-west.
- Routes reflect old city boundary to Murphy Road (ie. before 1990).
- Route 1 should be extended to serve the Exmouth Extension, return via London Road to Murphy Terminal.
- Route 2 Devine should be 30 minutes all day.
- Routes 3/4 – 30 minutes all day, make routes loops all day – 3 one direction, 4 the opposite.
- Routes 5 and 7 should be dial-a-ride all day Saturdays and Sundays (one opinion). Others felt 5, at least, should be 30 minutes all day. Also, route 5 too confusing – too many different routings by time and day of week.
- Route 7 should be re-routed to take in Errol Road apartments.
- Route 9 – have trip to Heritage Park off time (15/45). Ok with idea of change in loop within Heritage Park. Ok for ½ hour to UWO park and Heritage Park.
- Route 11 Davis – low ridership.
- Route 12 – run clockwise via Houser/Louisa. If changed, then need to adjust timing of light at Lite and Front so bus does not have to wait so long.
- Route 15 – should have an 830pm trip but not 1030pm.
- Saturdays: route 1 – should be the same as weekdays – go to Walmart/Murphy Terminal all day. Confusing having it end at Wellington and require people to transfer. Would help 14 stay on time.
- Saturdays: route 14 – same as weekdays. Should not go to Walmart.
- Terminals – need a covered or "better" terminal downtown. Same at Murphy Road and Northgate. Agree with approach of re-structuring routes then decide terminal needs and location.
- Marketing – Need marketing ads to educate public/transit users on rules and conduct on buses; More informative ads on buses and shelters; use bus destination signs and LEDs boards inside buses to give out messages; use back of transfers to provide messages; Route Map Brochure should be more informative to include fares, advise users to tell driver where they want to go. Combine separate route map and schedule brochures into one.

- Major transit users – low income, seniors, students and young mothers but do feel it is possible to attract others if routes are more direct and convenient.

Conclusions

Overall, stakeholder feedback indicated that:

- There is an increasing need and support for improved transit service and for transit to play a greater role in the community. The objectives of enhancing mobility, reducing car use, reducing transportation costs and improving air quality were common themes;
- Sarnia Transit routes need to be revised to reflect current travel patterns in the city and to be more direct;
- Simplify route network – too many variations;
- Improved service levels and service frequencies were required during the daytime, evenings and Sundays along with a re-orientation of the route structure;
- Transit use needs to be promoted through Increased marketing and communications with residents, employees, employers;
- Increased use of transit by post-secondary students should be pursued; and
- Need to expand transit to new areas.

Stakeholder consultation was also undertaken to review the conclusions from the System and Market Assessment step and to review future transit service strategy options following the completion of the draft final report and, specifically, proposed improvements to the transit system.

Based on the comments, the following are the key conclusions for improving Sarnia Transit's services.

Exmouth Street corridor is a strong example of how transit can succeed in Sarnia

Sarnia Transit has achieved success in developing a major transit corridor – Exmouth Street – with high frequency service throughout the day and subsequently high ridership. The route connects key destinations – downtown, retail nodes, and Lambton College – and connecting routes depend on it to bring its riders to these destinations. However, the question of whether its success and the resources dedicated to the route are limiting the ability for other corridors to be better served must be addressed as part of the development of service strategies.

Maintaining timed-transfer system will require adjustment of routes to reduce average speed and improve on-time performance

In response to the need to serve new areas of the city and to reduce operating costs, Sarnia Transit has extended routes to their limits, a key example seen by the on-demand route extension of Route 5 into new residential areas in the east

end of the city. Other routes were extended to new areas with no additional running time – largely to maintain the timed-transfer concept, but also to make these changes without increasing operating costs. A comprehensive review of route structure is needed to address operating speed risks, better serve expanded urban areas, and meet demands on running time that will result from accommodating accessibility needs.

Route system does not reflect changing travel patterns

Sarnia's travel patterns are changing with shifting employment, retail, and residential trends. The transit system is predominantly oriented in an east-west direction, which reflects travel to the College and retail areas, but does not serve employment travel, which is predominantly in a north-south orientation. This is reflected in the city's low transit mode share for work-based trips. Also, changing retail patterns are not well served by the existing transit network. The new retail areas – Lambton Mall and large-format retailers around Quinn Drive – are not well served by the current system.

Substantial opportunity to leverage ridership increases to Lambton College to improve overall system

Recent increases in ridership are largely driven by increased use of transit to and from Lambton College; however, only minor changes in the transit system have been made. The Sarnia Transit Master Plan provides an opportunity to leverage these ridership increases to adjust and restructure the system to better serve and retain these new riders, but also attract other travel markets.

4. Market Assessment

This section provides an overview of the transit market in Sarnia including:

- An analysis of demographic trends in Sarnia, which includes reviewing past and future population change, age and ageing, household income, and immigration;
- A review of impacts of planned development and future growth areas in the city;
- An analysis of major destinations and trip generators, including retail, schools, Lambton College, health facilities, and community services; and
- A review of travel patterns emerging from the development of the City's Transportation Master Plan and the implications for transit.

The review of the above will allow for the identification of market opportunities and subsequent service strategy options.

4.1 Demographic Trends

Population Change

The population of Sarnia increased slightly between 2001 and 2011 and, based on Lambton County population forecasts, is expected to remain stable for the planning period of the Transit Master Plan to 2016. A slight decline in population occurred in Point Edward between the 2001 and 2011 census years, with a similar decrease projected to 2016.

Exhibit 4-1: Census and Forecast Population 2001 to 2016

	2001 census	2006 census	2011 census	2016 forecast
Sarnia	70,876	71,419	72,355	71,211
Pt. Edward	2,101	2,019	2,030	1,916

While population is expected to remain stable, there will be changes resulting from demographic change and development patterns. The challenge will be to meet the needs of these changes without a significant increase in population – which is traditionally relied upon to increase tax assessment base and grants, such as gas tax, that are tied to population.

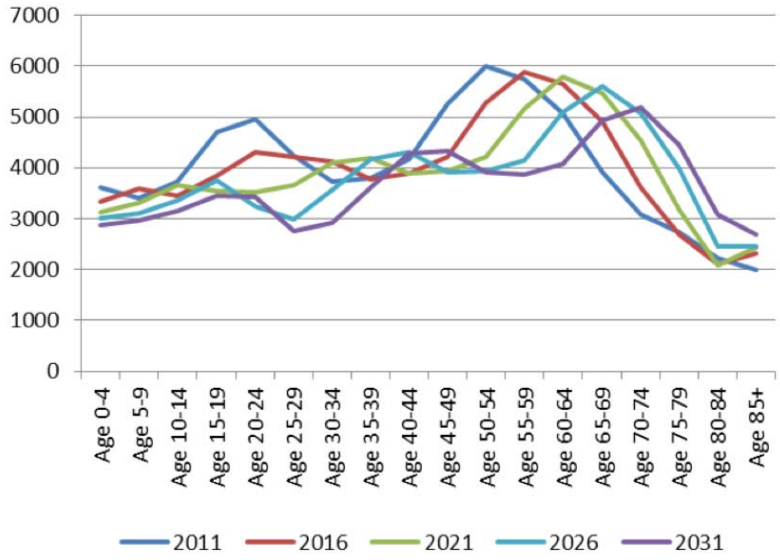
Ageing Population

A more significant change in Sarnia's demographics, which has a greater impact on transit, is the ageing population. Although not unique to Sarnia, the city has a higher proportion of the population over the age of 65 compared to the rest of Ontario and Canada. In the 2011 census, approximately 14,400 people in Sarnia

and Point Edward were over the age of 65, or 19% of the population. The median age in Sarnia and Point Edward is 44.8 and 50.7, respectively (Ontario median age = 40.4). Between the 1996 and 2011 census years, the proportion of population over the age of 65 increased from 15% to 19%. Further, between 2001 and 2011, the median age in the City of Sarnia increased from 40.5 to 44.8.

The trend of ageing population will continue, as shown in the projected age distribution graph in Exhibit 4-2. The graph shows the increasing proportion of adults older than the age of 65 and by 2026, the peak in the age distribution in the city will be at age 65.

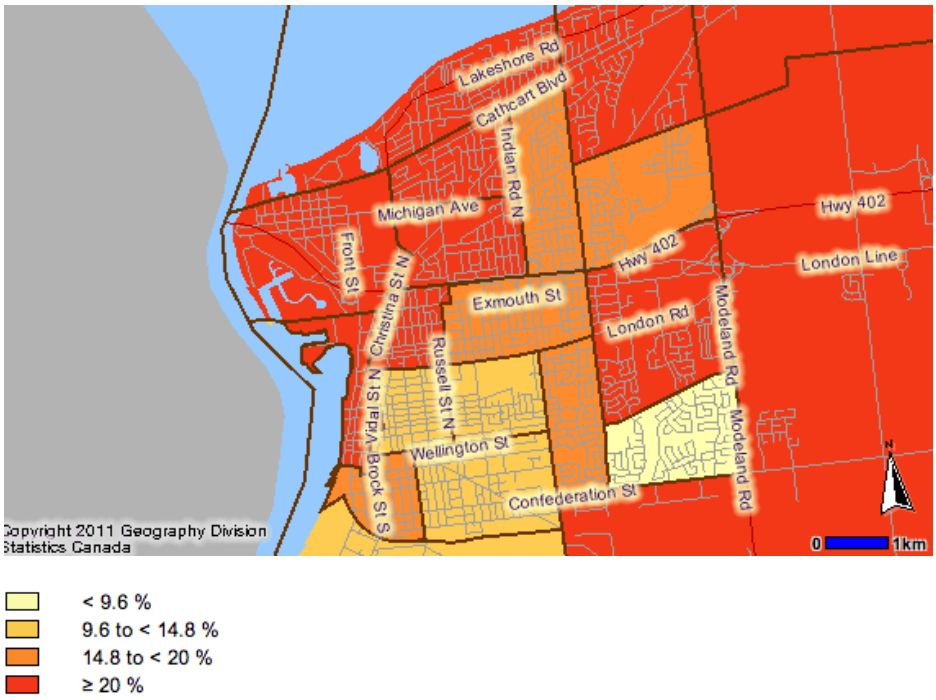
Exhibit 4-2: Projected Age Distribution, City of Sarnia



Source: Lambton County Population and Demographic Forecasts

Based on census data, many adults in Sarnia over the age of 65 live in private households, with approximately 1 in 4 living alone. An increasing number, however, are living in private communities and care homes. Exhibit 4-3 shows the proportion of population over the age of 65 by census tract, based on the 2011 census. It shows the areas with the highest proportion of adults over 65 include the north end of Sarnia, in the vicinity of Lambton Mall, Point Edward, and downtown. It should be noted that transit ridership, but also service, is lowest in the north end and in Point Edward, despite the high proportion of captive ridership.

Exhibit 4-3: Proportion of Population Over 65 by Census Tract, 2011 Census



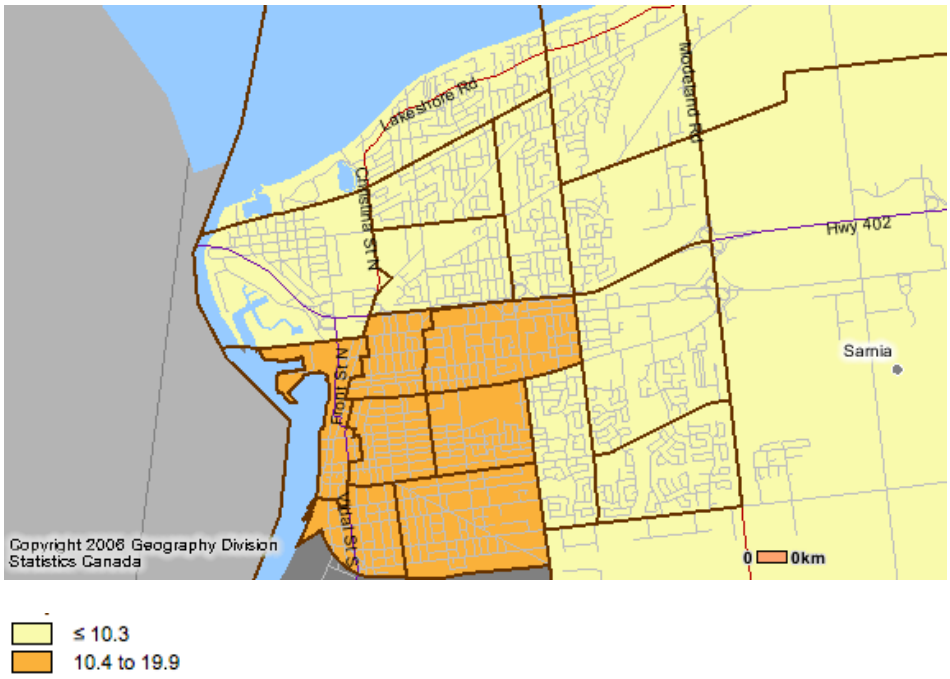
The implications of an ageing population are clear. As we get older, mobility challenges become more prevalent and the reliance on public transit service increases. A functional transit system is essential to meeting day-to-day travel needs of this growing segment of the population that will have higher expectations for quality of life than past generations. Mobility is also essential for the physical and social well being of older adults. The ageing population will also create challenges for specialized transit services, such as Care-A-Van.

Household Income

Household income is also an indicator of captive transit ridership – there are higher rates of transit usage among those with lower income in small- to mid-sized cities. Overall, Sarnia's median household and individual incomes are comparable to the Ontario average. Based on 2006 census data, the median household and individual income in Sarnia was $69,731 and $26,971 respectively, compared to Ontario median of $69,156 and $27,258. The proportion of low-income households in Sarnia in 2006 was 11.7%, which was below the Ontario average of 14.7%

Exhibit 4-4 shows census tracts based on the proportion of households that are classified as low income. The map shows that the census tracts with higher proportions of low-income households are concentrated in older areas of Sarnia (between 10 and 20% of households). This is consistent with the housing stock in these areas that have a greater proportion of apartment and rental housing. Furthermore, the areas identified in the exhibit are well served by the existing transit network.

Exhibit 4-4: Proportion of Households Classified as Low Income, 2006 Census



Immigration

Recent immigrants are also a potential market for transit as they tend to come from countries where dependency on transit is greater, may not know how to drive, or do not own a vehicle. Approximately 15% of the population in Sarnia are immigrants to Canada since 2001, based on the 2011 National Household Survey.

Recently, there has been an influx of international students as part of Lambton College's marketing effort to attract more students. Approximately 400 international on-campus students study at Lambton College in a variety of programs including undergraduate and graduate programs. International students are attributed to be a main driver of recent growth in ridership at Sarnia Transit.

Summary

Key findings from the review of demographic trends and their implications for Sarnia Transit include:

- A stable population, which will create a more certain environment for the planning of transit services;
- An ageing population, which will likely increase the demand for transit in the city but also add challenges to provide fully accessible transit services;
- Areas with higher proportion of low-income households that may be more dependent on transit; and,

- A significant cohort of international students that have become an important base of customers and ensuring that service quality retains and attracts this market.

4.2 Growth Areas

In 2001, Sarnia's Official Plan designated two growth areas in the east end of the city, shown in Exhibit 4-5. Both areas are predominantly residential. Secondary Plan Development Area 1 is located around the existing and future Rapids Parkway and includes lands for the new consolidated Catholic secondary school. Area 2 is located east of Modeland Road and south of London Road and includes designation of additional employment lands south of Confederation Street and east of Modeland Road.

Exhibit 4-5: 2001 Official Plan Growth Areas

At build out, Area 1 will have approximately 1,881 lots/units of housing and Area 2 will have 2,816 units/lots of housing. The overall density of these residential areas will be approximately 5 units per acre, or 12.5 units per hectare. This is below the suggested minimum density for basic transit service of 22 units per hectare, as set out in the Ministry of Transportation's Transit Supportive Guidelines. However, medium density residential is designated in key nodes in both growth areas – immediately north of Highway 402 in Area 1 and along Heritage Park Drive and south of London Road in Area 2. These medium mixed residential areas are targeted to have 7 units per acre, or 18 units per hectare. The adjacency of these medium residential areas to employment uses would likely meet the suggested minimum 50 residents and jobs threshold for basic bus service.

Exhibit 4-6: Suggested Minimum Density by Transit Mode

Transit service type	Suggested minimum density
Basic Transit Service (One bus every 20-30 minutes)	22 units per ha / 50 residents & jobs combined
Frequent Transit Service (One Bus every 10-15 minutes)	37 units per ha / 80 residents & jobs combined
Very Frequent Bus Service (One bus every 5 minutes with potential for LRT or BRT)	45 units per ha / 100 residents & jobs combined
Dedicated Rapid Transit (LRT/BRT)	72 units per ha / 160 residents & jobs combined
Subway	90 units per ha / 200 residents & jobs combined

Source: Ministry of Transportation Transit Supportive Guidelines

Transit service is currently provided on an on-request basis in Development Area 1 by ROUTE 5 ROSEDALE on Rapids Parkway. Route 9 EXMOUTH-HERITAGE PARK provides regular service to the new residential neighbourhood in Heritage Park, located northeast of Modeland Road and Confederation Street. However, based on operator feedback, ridership in Heritage Park is low, although there are regular passengers on this branch of Route 9 travelling to Bingo Country on Upper Canada Drive.

Addressing service needs to Area 1 will need to be considered as part of this study, particularly with the recent announcement of the consolidation of Catholic secondary schooling at St. Christopher Secondary on Rapids Parkway. The introduction and phasing of transit service in both growth areas will be heavily dependent on the rate of growth. The completion of planned road linkages, such as The Rapids Parkway, will also have implications on the transit service.

Retail Development

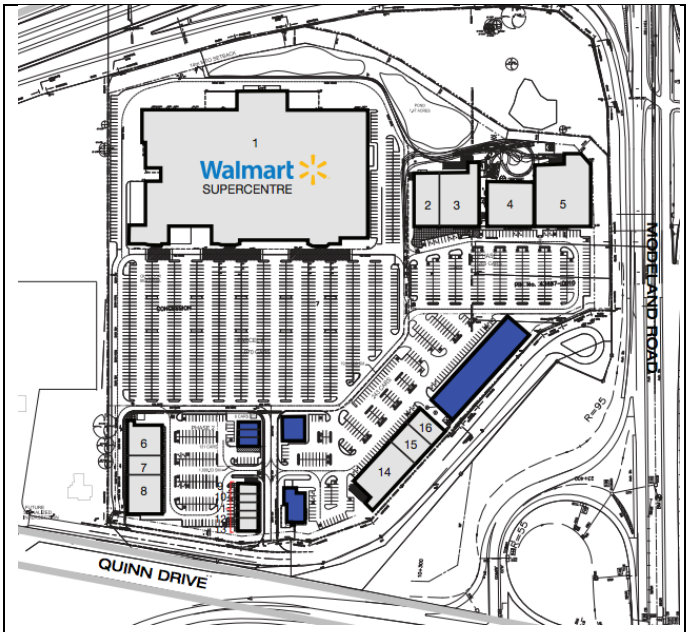
An important consideration for the planning of transit is to be aware of retail trends and developments within the service area. Retail serves as a major destination for transit customers and is also a major generator of employment.

Traditionally, Sarnia Transit has aligned well with the retail nodes of the city; the three transit terminals – at downtown, Northgate, and Murphy Road – were located at major retail destinations and served as logical points of focus for the transit network. In Sarnia, recent patterns have indicated that retail is moving away from the first generation of suburban retail strips to new clusters in the periphery of the city. These new developments are more auto-oriented and more difficult to serve by transit than past retail areas that were closer to the centre of the city. The largest of these new developments are centred on SmartCentres Sarnia and Lambton Mall. These nodes, located on the east end of the city, represent approximately 1-million square feet of retail. Many of the retail tenants in these two shopping complexes – Sears and Sport Chek, for example – were

previously located at other locations in Sarnia that are now vacant. Downtown Sarnia, however, has retained its unique place for retailing in the city as the location for many boutique and independent shops.

Service options for Sarnia Transit will take into account these changes in retail destinations and address current challenges in serving them. For example, current service to SmartCentres on Quinn Drive experience delay during peak times with auto congestion. In addition, reviewing the role of former retail nodes – Northgate and Murphy Road – will be part of the study to reassess transit's role in serving these centres. The review of plans for redevelopment, where present, will be part of this assessment. Also as part of the analysis will be to ensure that transit services to local retail nodes (for example, Indian Road and Devine Street), which include grocery stores and local services, is optimized to ensure it meets the needs of local travel.

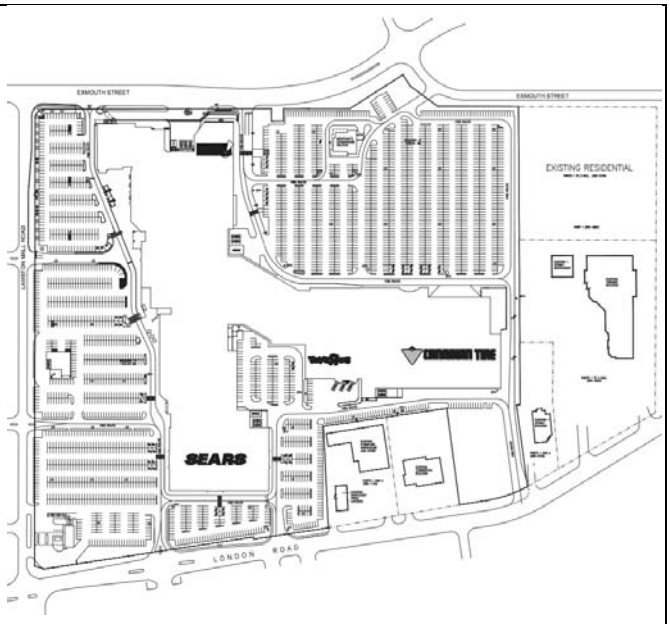
Exhibit 4-7: Site Layouts - Sarnia SmartCentres and Lambton Mall



SmartCentres Sarnia

Total size: 340,000 sq. ft.

Major anchors: Walmart, Winners, LCBO, Petsmart, Michaels



Lambton Mall

Total size: 618,000 sq. ft., 87 stores

Major anchors: Sears, Canadian Tire, Galaxy Theatres, Toys R Us, Sport Chek

4.3 Travel Patterns

Peak Period Travel Patterns

As part of the Transportation Master Plan, travel patterns in Sarnia were modelled based on existing population and employment in city. These patterns are shown in Exhibit 4-8 and Exhibit 4-8.

The modelled travel patterns show a north-south orientation of travel during the peak periods as residents travel to employment areas in the south end of the city. These patterns are inconsistent with the east-west orientation of the transit system. However, east-west demand is observed in central sections of the city, which reflects the mixed-use nature of central Sarnia communities. The shift in retail is reflected in the modelled travel patterns, with afternoon peak hour travel patterns showing travel flows to the newer residential node on the east end of the city.

The travel patterns provide some insight to lower ridership in routes from the north end. The existing transit network serves neither work-based trips nor retail trips. For example, a work trip from the north end to south end of the city would require at minimum two transfers, at Northgate and at Downtown or Murphy Road. A retail trip to Lambton Mall would require also require two transfers. For most other areas of the city, both work and shopping trips can be completed with one transfer.

Transit service options to meet the travel needs indicated by these travel patterns will be developed as part of the next step of the study and preparation of the medium and longer term transit master plan.

Exhibit 4-8: Modelled AM Peak Hour Travel Patterns

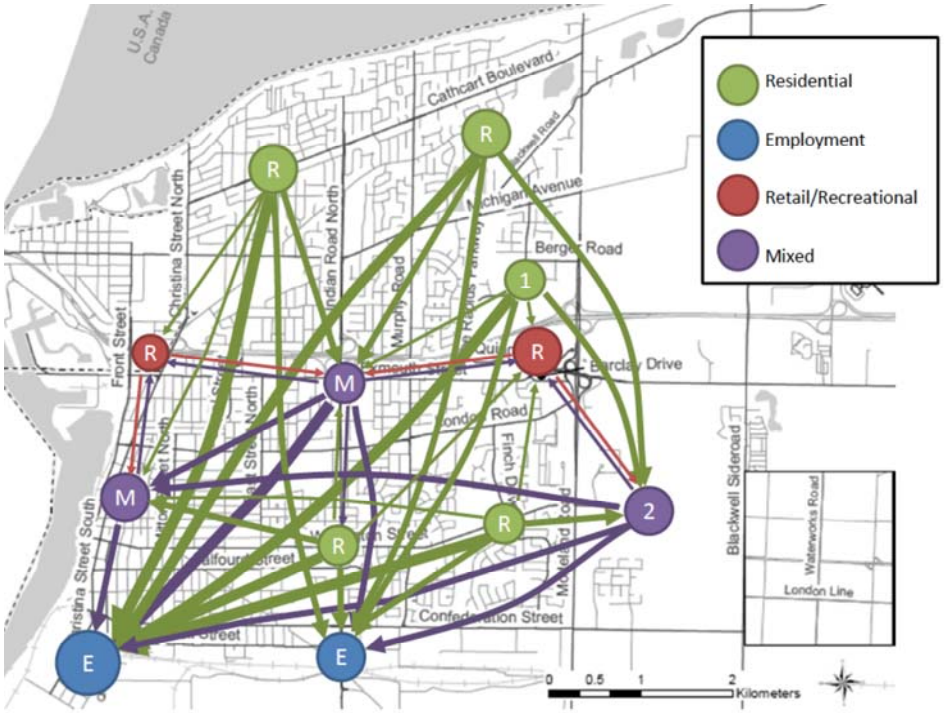
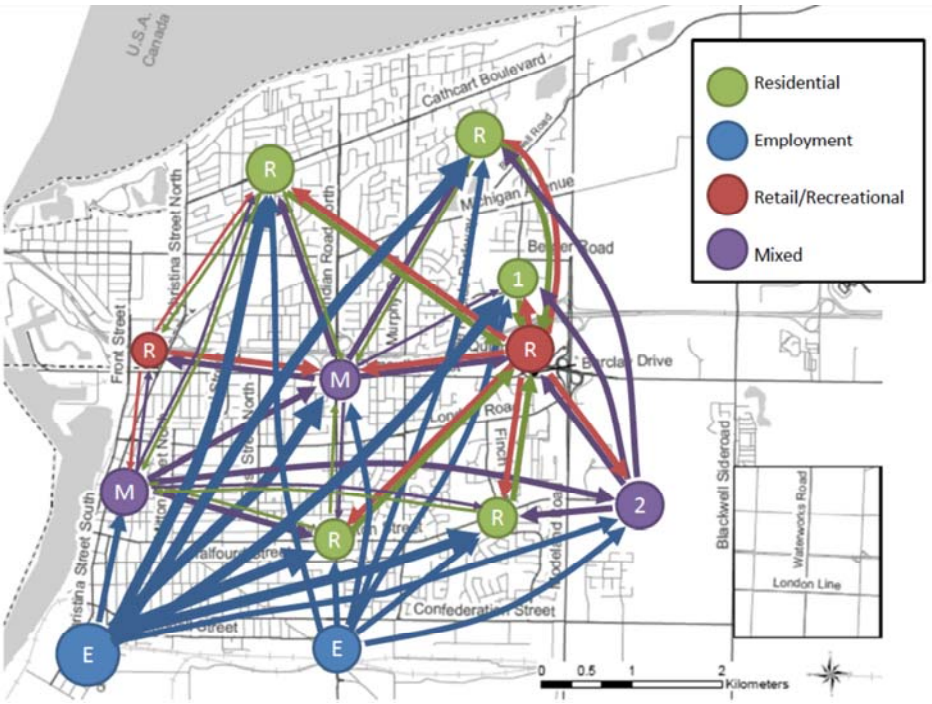


Exhibit 4-9: Modelled PM Peak Hour Travel Patterns



Mode Share

The 2006 Census included statistics regarding travel-to-work mode share and is the most recent information available to determine transit mode share in Sarnia. The census showed just 2.3% of work trips in Sarnia were by transit, which is lowest amongst its Ontario peers, as shown in Exhibit 4-10.

Exhibit 4-10: 2006 Census Travel to Work Transit Mode Shares

City	2006 Census Work Trip Transit Mode Share
Sault Ste. Marie	4.2%
Brantford	4.1%
Peterborough	3.6%
Niagara Falls	2.8%
Sarnia	2.3%

The proportion of work trips by transit in Sarnia is low; however, there are several factors that contribute to this value that are not unexpected. First, Sarnia's employment is largely based around industrial sectors and in work locations that are of low intensity and difficult to serve by public transit. Cities with higher transit mode share for trips to work are generally office-based or focused on central areas such as downtowns. Second, as noted in the peak period travel patterns, the transit network does not serve the city's employment areas, located in the south end of the city well. Nearly all trips to employment

areas south of Confederation Street require at least one transfer and long travel times. Encouraging greater use of transit for work-based trips should be a future objective of the transit master plan.

4.4 Lambton College Survey

In March 2012, Lambton College conducted an online survey of its students and employees regarding their use of Sarnia Transit and other transportation to and from the east end campus. Approximately 140 responses were received from this survey; Lambton College has approximately 3,600 full-time students. Of the respondents, 71% were students, 21% were employees, and 8% were both students and employees of the college.

The survey provided insights into the travel behaviour of the respondents, such as frequency of travel to Lambton College. This can indicate the need for expanded service outside traditional times of travel. Approximately 60% of respondents indicated they travel to Lambton College every weekday; however, 20% of respondents indicate they travel to the college 7 days a week. Most travel during traditional morning and afternoon peak periods; however, many respondents indicated travel during the midday and evening periods as well.

How a respondent travels to the college is also indicated in the survey results. Of the respondents, 55% of them regularly use Sarnia Transit to get to Lambton College, while 24% drive alone, 10% carpool or are dropped off, and 12% walk. This reflects the observation that transit mode share is significantly higher at the college than in other parts of the city. The cost of parking, $165 per semester, is also a deterrent to driving, especially given that the price of a transit pass is slightly lower, at $155 per semester. The unlimited rides provided by the transit pass likely encourages riders to use Sarnia Transit for other trips as well; 62% of the respondents in the survey identify as “frequent users” of Sarnia Transit in that they make trips on transit other than to travel to and from the college. Major destinations other than the College concentrate near retail areas, particularly at Lambton Mall, London Road, and Murphy Road.

Of respondents identifying as customers of Sarnia Transit, 60% indicate that they do not have access to a vehicle and 41% indicate that the bus provides a more affordable travel option. Satisfaction with Sarnia Transit is also high amongst respondents who use the service: 40% rate the service as “excellent” or “good”, 45% rate the service as “fair”, while only 15% rate the service as “poor”. Primary issues that respondents indicate that lead to dissatisfaction include service frequency (41% are “unsatisfied” or “very unsatisfied”), hours of service (45%), and schedule reliability (37%). Conversely, the issues that lead to satisfaction include schedule reliability (45% are “satisfied” or “very satisfied”), availability of seats (53%), walking distance (75%), cost (54%), convenience (55%), and travel time (52%).

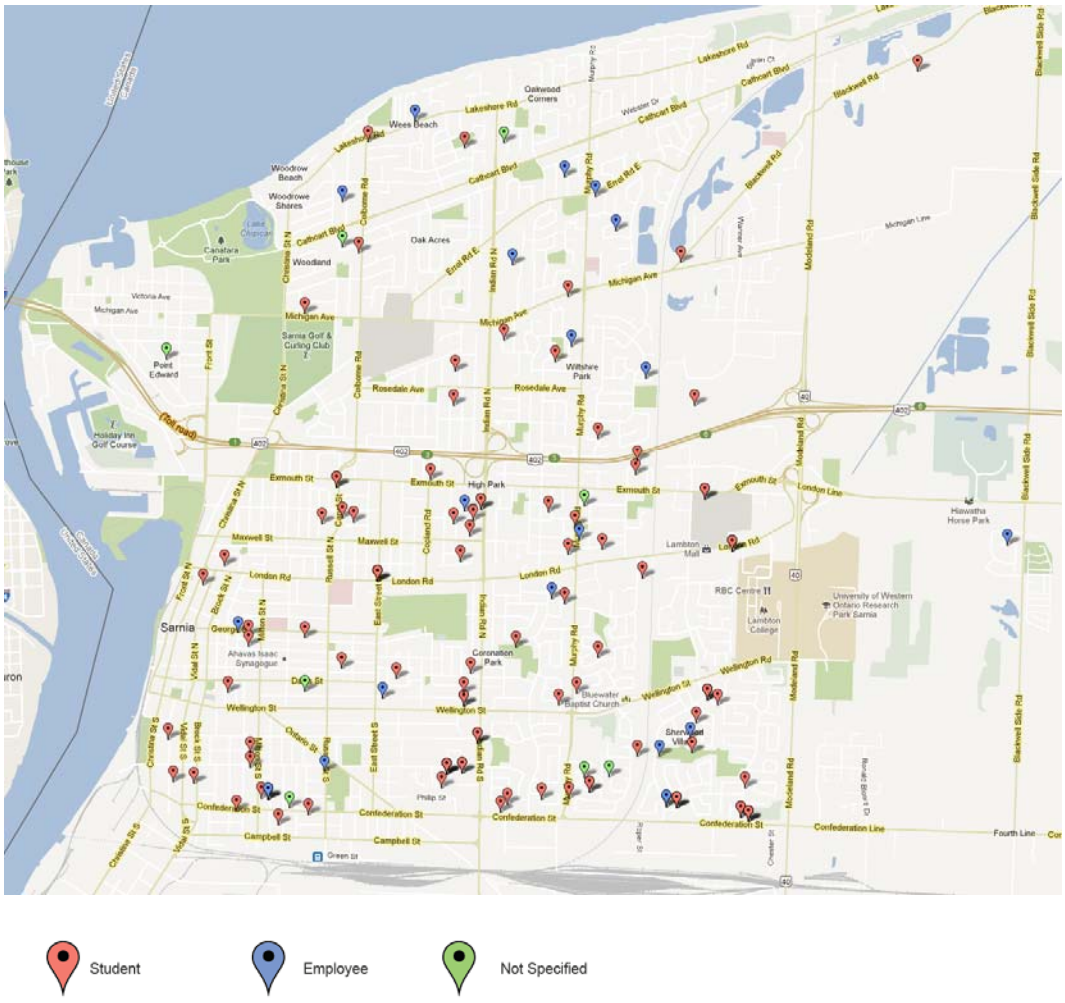
Of respondents who do not use Sarnia Transit, various reasons were given, including the length of the trip (55%), frequency (40%), and service coverage (30%). Approximately 45% of the respondents who do not use Sarnia Transit say car travel is more comfortable. These reasons why respondents do not use Sarnia Transit are generally consistent with the issues identified by riders causing dissatisfaction; however, it should be noted that many riders are

satisfied with the length of trip on transit. This may indicate challenges around perceptions of transit service.

Geography of Respondents

The survey results also provided an insight to the place of residence for Lambton College students and employees. Postal codes were requested and subsequently geocoded onto a map, shown in Exhibit 4-9. The results are consistent with observed ridership patterns from operators and transit staff for where student demand is high, including the Devine Street corridor and the Exmouth Street corridor. Of the respondents, approximately 40% of the respondents live along the Wellington/Devine Street corridors, 20% along the London Road/Exmouth Street corridors, and 15% from the north end of Sarnia. Of these three areas, only the Exmouth Street corridor provides direct transit service to Lambton College. The high proportion of respondents in the Devine Street corridor is consistent with ridership observations and adds evidence to the need to increase service to the college.

Exhibit 4-11: Lambton College Survey Results



4.5 Market Assessment Summary

Sarnia Transit has an opportunity to increase ridership amongst a number of key markets, including:

- **Work-based trips** that are currently not well-served by the transit system;
- **Lambton College**, both students and employees, which is a large contributor to recent increases in ridership growth;
- **Retail trips** that influence ridership in off-peak periods; and
- **Older adults** and other people with mobility challenges, who are most reliant on Sarnia Transit.

Opportunities to increase work transit mode share

Sarnia Transit does not currently serve work-based trips well, as reflected by the city's low transit mode share. Making transit more attractive to get to and from work is a significant opportunity to increase ridership and meet the city's transportation objectives. Currently, the route network requires multiple transfers to travel to the city's main employment areas. Providing more direct routes could make transit more competitive and attract higher ridership.

Continued focus on largest transit node – Lambton College – and leveraging transit growth to other market segments

Recent increases in ridership have largely been from higher enrolment, particularly from international students, at Lambton College. This is a large captive transit market – a market that may not have access to a vehicle and are willing to try and use transit regularly. This is a major opportunity for Sarnia Transit to attract a substantial number of new riders and service needs to be attractive to retain them. Increasing and providing direct service from Lambton College to more areas of the city will help build this market.

Position transit around emerging retail areas

Transit customers travelling to and from retail and entertainment areas drive off-peak ridership, particularly in the evening. However, recent trends and new development in retail in Sarnia have created new centres while older ones play a lesser role. Sarnia Transit is structured around the older retail nodes – Northgate and Murphy Road – while retail has migrated to Lambton Mall and new large-format retailing on Quinn Drive. Downtown, however, is maintaining a role for specialty and independent stores. Ensuring that the transit system serves retail trips will be essential to meet the travel needs of transit customers and potentially attract more ridership.

Meet needs of ageing population and Accessibility

Finally, like in many communities across the country, Sarnia's population is getting older and mobility needs of this segment of the population will increase demand on transit services. Adjusting transit to meet these needs will involve a

combination of infrastructure investments – fully accessible buses, bus stops, and terminals – and service changes to accommodate travel patterns and the unique needs of this market. In particular, as noted in section 5.6, making Sarnia Transit service fully accessible by accepting wheelchairs and scooters is an important first step to fully meeting the needs of people with disabilities.

5. Transit Department Review

This section reviews the transit department's physical assets (infrastructure – fleet, transit facility, terminals, stops and shelters), vehicle maintenance program, fare collection practices, marketing and communications activities and the status of service accessibility to meet the requirements of the AODA.

A review of the department's existing technology systems (ITS) and future needs is documented in a separate report as part of the overall Transportation and Transit Master Plan study.

5.1 Infrastructure

This section reviews and assesses the physical assets of the City's conventional transit service - its bus fleet, facilities (transit garage, terminals, bus stops and shelters), and its vehicle maintenance practices.

Fleet

The conventional transit vehicle fleet totals 23 units as well as six units in the Care-A-Van fleet as summarized in Exhibit 5-2. Two new low-floor 9.8m (32 ft) transit buses were received in late 2013 which replaced two older, high-floor vehicles. Two new buses are to be ordered in 2014 once the provincial joint procurement order, through Metrolinx, is confirmed. In addition to the buses, there are two service trucks and two supervisory vehicles in the transit fleet.

For its size, the transit fleet has an unusual mix of vehicle types and sizes, specifically, both high-floor and low-floor mid-size buses and smaller "cut-away" (body on chassis) buses. There are five of the small high-floor cut-away buses, six mid-size (9.7 m) high-floor buses and twelve mid-size low-floor buses. This vehicle mix can complicate vehicle/route assignments as well as responding to capacity issues. The current situation with the Point Edward/Devine routes is an example. It can also contribute to a higher than average vehicle spare ratio.

The fleet average age is approximately 10 years for the large bus fleet, and eight for the small bus fleet. Full size, 10.7m/12.2 m buses can reasonably achieve an 18 year life cycle depending on vehicle design and the extent of any refurbishing carried out, indicating an average age of 6 to 9 years with a consistent replacement cycle while mid-size 9.1m/9.8m buses have a shorter life cycle of 12 years. Small buses have an economic life of 5 to 7 years representing an average age target of 3 to 4 years. Based on these guidelines, the small bus fleet is beyond its economic life while the large bus fleet has a higher than desired average age. Although significant progress has been made in recent years to update the large bus fleet, there are still six buses that are 20 years or older. If the same vehicle mix continues (18 large and 5 small buses), one large bus and one small bus should be replaced each year in order to maintain a target 18 year (large bus)/6 year (small bus) life cycle.

The department's capital asset plan includes the purchase of one large or mid-size replacement bus and one small replacement bus in 2014 followed by one large and one small bus replacements in 2015. Thereafter, the vehicle replacement program indicates one per year to 2021.

While all buses are technically "accessible" (able to board wheelchairs and other mobility devices), the high-floor large and small cutaway buses have lifts which present significant time issues when boarding/exiting a person using mobility aids as well as having high maintenance costs associated with the lift mechanism. Low-floor, ramp-equipped vehicles are preferred. Therefore, these vehicles should be replaced at the earliest opportunity with more suitable low-floor vehicles. In view of vehicle capacity issues due to both ridership volume on key routes as well as the potential impact of accepting mobility devices on conventional transit, the department has recommended 12.2m (40ft) buses for purchase in 2014.

A review of the City's past strategy of small and medium size bus purchases and particularly the continued use of small cut-away type buses for transit service in view of both ridership and accessibility issues is required. The City may need to transition to larger, low-floor buses in place of the small buses and similarly, full-size 12.2 buses in place of the medium size buses in future in order to provide appropriate space capacity within the vehicles to respond to accessibility needs and passenger volume.

Exhibit 5-1: Sarnia Conventional Transit Fleet

Fleet #	Manuf.	Model	Year	Type	Length	Seats	Notes
021 - 022	Thomas	SLF235	2002	Low-Floor	9.7m	26	
031	Ford	E-450	2003	Hi-Floor	7.6m	15	
041 – 044	OBI	01.507	1990	Hi-Floor	10.7m	39	Acquired 2004
051	Ford	E-450	2005	Hi-Floor	7.6m	15	
052 – 053	OBI	01-505	1994	Hi-Floor	9.7m	32	Acquired 2005
062 – 064	Ford	E-450	2006	Hi-Floor	7.6m	17	
081 – 083	Eldorado	EZ Rider II	2008	Low-Floor	9.7m	30	
091 – 092	Eldorado	EZ Rider II	2009	Low-Floor	9.7m	31	
101 – 102	Eldorado	EZ Rider II	2010	Low-Floor	9.7m	31	
121	Eldorado	EZ Rider II	2013	Low-Floor	9.7m	31	
131 – 132	Eldorado	EZ Rider II	2013	Low-Floor	9.7m	28	
Total	**23 units**						

Spare Ratio

The fleet spare ratio currently stands at approximately 35%, or 8 vehicles, on the basis of 23 buses in the fleet and a maximum in-service requirement for 15 vehicles. A normal transit spare ratio guideline is 20%, or 4 vehicles, which would indicate that there are four more vehicles surplus to needs. However, the age of the fleet and the presence of the two distinct fleet sizes and associated operational constraints contribute to the need for a higher spare ratio. If the Sarnia Transit fleet was more standardized then the number of spares and total fleet size could be reduced.

Transit Facility

The operations and maintenance facility on Michener Road dates from 1976 and incorporates areas for all transit functions – administration, operations, vehicle maintenance, vehicle servicing and cleaning and storage. The maintenance area is equipped with three two-post hoists and one inspection pit. The number of hoists in the maintenance garage and the size of storage area are sufficient to handle service expansion for a number of years to come. Vehicle storage is indoors with space for 30 buses.

The facility was designed originally with the ability to easily expand all three main functional areas (administration/operations, maintenance and storage) without having to modify or rebuild the core part of the facility.

Overall, the building appears to have been generally well-maintained and appears to be in good condition. The pavement in all exterior areas is in good condition as is the security fencing. The maintenance, parts storage, vehicle storage and service lane are clean and organized. All areas of the building are well lighted and clean although the administration and operations area are due for repainting.

Over the past few years several improvements and replacements have taken place to the main building components which include the following:

- Hoists – One complete unit and a rear section of another part have been replaced over the last two years while the third hoist is scheduled to be replaced next year;
- Vehicle wash-rack – the system was replaced three years ago;
- Lighting – All lighting in the maintenance area has been replaced as has the lighting in the wash-bay and exterior yard;
- Heating/ventilation/Air conditioning (HVAC) – replaced approximately five years ago;
- Roof – replaced in 2011; and
- Overhead doors – several of the large exterior doors are scheduled to be replaced starting in 2013.

Terminals

There are three formal transit terminals or transfer facilities within the city: an on-street location downtown at the intersection of George and Vidal Streets beside the Bayside Mall; at the Northgate Shopping Centre on Exmouth Street at Colborne Road; and on Murphy Road at London Road adjacent to the Real Canadian Superstore.

Downtown

At the downtown location, buses park at designated locations on either George or Vidal Streets. The current location is considered interim following a move from the previous terminal location further south on Christina Street. Four shelters and benches are provided together with some route and schedule information for the convenience of transit users. However, there is no formal facility. There have been several studies over the past number of years to consider a more suitable, permanent location for a transit terminal which could include the construction of a more formal "terminal" building with indoor amenities for transit users.

Northgate Shopping Centre

The terminal facility at the Northgate Shopping Centre serves as a satellite terminal where routes 5 and 7 during the daytime and the evening demand-response service connect with the system's main trunk route, 9 Exmouth. Separate in-bound and out-bound stop positions are provided around an "L" shaped platform. A decorative shelter has been installed to improve the attractiveness of the terminal.

Murphy Road

This terminal is the busiest in the transit system with 7 routes accessing the facility. It is also the primary transfer point between all routes serving the east end of the city and for people wishing to access either the shopping areas at Exmouth and Lambton Mall Road or Lambton College.

The terminal consists of a centre island platform with buses stopping on both sides. There is one shelter complimented by several benches and waste receptacles. A route map and schedule information is provided inside the shelter. Notably, buses exiting southbound from the terminal have the benefit of a traffic signal priority phase for the left turn onto Murphy Road.

Within the constrained space made available by the Superstore, transit staff have been able to construct a compact, useful terminal. However, the terminal is beyond capacity and during peak hours buses are parked in two parallel rows. From an accessibility standpoint, the terminal would not readily be able to meet the needs of people using mobility aids.

Stops and Shelters

Stops

There are approximately 600 bus stops within the City for the system's fixed route services. Sign locations are determined by Transit staff in consultation with the Traffic department and are then installed by Public Works staff. Bus stops are a core component of any fixed route transit service. They serve three important functions in the operation of a transit system by:

1. "Advertising" to users where bus services exist;

2. Indicating where users should position themselves to access the transit service; and

3. Designating the spot where the bus operator is to stop the vehicle.

Thus, careful attention must be given to stop placement. While there are pros and cons to stop placement at intersections, industry experience and analysis generally favours a "nearside" placement for four reasons:

- **Safety** – users are protected by traffic signals, where they exist; the bus operator has better view of intending passengers since they

are more likely to approach the bus from the front as opposed to the rear; users are less likely to cross the road behind the bus away from an intersection; stopping "far" side is unexpected after clearing an intersection and thus could lead to rear-end accidents;

- **Convenience** – at intersections, the bus need only stop once; users can more readily transfer to a connecting bus with signal protection;

- **Time saving** – the bus can make use of the stop phase to board passengers; and

- **Curb space** – the bus stop area can take advantage of an existing right turn lane or the intersection for its departure compared to a far side stop.

Independent of a preference for a "far side" versus a "near side" stop placement, the actual stop location must take into account various factors such as the location of the travel destination and available curb and sidewalk space for stopping and boarding. Mid-block locations are also common and occur where a travel origin/destination is between intersections. In the final location selection, the stop sign should be precisely installed and be readily identifiable.

Sarnia's bus stop design is generic and not distinctive. Transit has adopted a dark yellow/gold colour for many of the stops which does improve awareness. A number include an indication of which route(s) serve the stop but without bus arrival times. However, overall the signs could be improved to be more distinctive by incorporating route information, a customer contact number, standardized use of the bus pictograph without the duplicating words "bus stop" and a colour matching the transit system corporate image. A distinctive stop design would help to increase visibility and awareness in the community. Many of the signs are single-sided and face one direction (towards on-coming traffic. Instead, all signs should be two-sided and should be readily visible from any direction for the benefit of passengers looking for the stop sign from different directions and sides of the street. To further enhance the distinctiveness of the bus stop sign, it should be of different size to differentiate it from standard traffic and parking signage. Further, the bus stop area should be designated and protected by "No Stopping/Parking" signage and supporting City by-law.

The transit system's bus stops are at various levels of wear and tear and with varying designs in use. Many signs and poles are damaged and a cursory review of bus stop locations shows an inconsistent approach to stop location and sign placement. Priority should be given to updating and maintaining the bus stop signage.

Shelters

There are 55 shelters located at bus stops throughout the City. All shelters are owned by the City having been assumed from the former shelter advertising contractor and most, therefore, have space for advertising. The majority of shelters are a uniform size of 1.5 m (4ft) x 3.3m (10ft) with an advertising panel at one end and one opening. A number of the shelters, particularly at the terminal locations, include a transit system route map and schedule information.

Because the City (transit staff) now handle the sale of advertising on shelters, unsold space is used to promote transit, specifically, the environmental benefits. Unfortunately, a cursory review of shelters and the advertising panels indicates that many of the signs are faded or in need of replacing. More creative and Sarnia Transit-specific signage could be developed for installation in the shelters.

With 55 shelters and some 600 bus stop locations, this represents a shelter/bus stop ratio of approximately 9% which is a very low ratio. In order to increase the attractiveness of using transit, the number of shelters should be increased and a specific target ratio established. A target shelter/bus stop ratio of 25 to 30% or higher is desirable. The City does not currently have a program for purchasing additional shelters or replacing the existing shelters. A majority of the shelters are now over 15 years of age and are in need of physical repair and repainting.

Sarnia also does not have shelter installation guidelines or a process and criteria for evaluating requested locations as a basis for prioritizing requests primarily because the City has not purchased a shelter for some five years. Shelters have, in the past, been located largely to suit the needs of the previous shelter advertising contractor. Together with a formal shelter installation policy and program, formal criteria should be developed to include such factors key trip generators, transfer points, exposed locations (where there is no natural shelter from the weather) and, secondarily, locations such as seniors' residences, health care facilities and recreational facilities.

There is also no continuing program to install benches at either shelter and non-shelter locations. Installation has been based on available advertising revenue. Installation of more benches should be considered with an installation target percentage of 10% of non-shelter locations (in addition to the provision of a bench at each shelter location) so that together with the shelter program, 25% to 30% of bus stops would have some form of customer amenity.

As part of a shelter installation policy and program, shelters will need to comply with the AODA Built Environment accessibility standards. The design standards prepared recently by the Ontario Public Transit Association provides appropriate guidelines in this regard and include the size and specification of concrete pads with tactile surfaces for people with sight disabilities, links to sidewalks for accessible pathways, and curb cuts.

5.2 Vehicle Maintenance

Transit staff maintain both the conventional and specialized transit vehicles which present a very positive image by being well-maintained and clean. All work including major mechanical repairs but not including major body repairs is undertaken in-house by the transit staff. Staff ensure that the vehicles are repaired promptly, are safe to operate and are maintained according to vehicle manufacturer's guidelines, provincial standards as well as the specific needs of Sarnia Transit operations. Maintenance services are also provided to out-of-town buses on a periodic basis.

Maintenance staff responsibilities include vehicle fuelling and cleaning as well as maintenance of the transit facility, bus stops and shelters all of which is handled by a staff of nine people including the Maintenance Supervisor. The ratio of staff to vehicles is 3:1 which is moderately below standard particularly considering the range of duties and extent of in-house maintenance undertaken.

Management and supervision of the maintenance functions is the responsibility of the Maintenance Supervisor. Although maintenance work is carried out on a 24-hour basis, 7 days a week, there is no supervision for the evenings, nights and weekends. Employees on duty during off hours are responsible for their own actions and decision-making. Senior mechanics act as lead-hands in the absence of the Supervisor. However, the limited level of supervision does leave the City at risk in the event of accidents or security issues. Additional supervision resources should be considered.

Maintenance Program

Vehicle maintenance work is scheduled over six days, Monday to Friday from 5.30am to 12.30am and Saturday from 7.00am to approximately 3.00pm. The work is performed by four (4) day mechanics – Monday to Saturday and one (1) mechanic - Monday to Friday – covering the pm shift. The number of mechanics on staff indicates a "mechanic/vehicle ratio" of six which is well within the transit industry guidelines of between 5 and 8.

The maintenance program is preventative in nature, that is, it is designed to prevent component or system failures and maximize the availability of the vehicles. It is distance-based with maintenance requirements determined by the "AGL – Cartegraph" fuel system software. Vehicle

kilometres are recorded electronically each day and the system produces a preventative maintenance (PM) work order every 6,400 km. Oil change intervals are based on the type of engine and range from 6,400 to 12,800 kms. There are six different inspection procedures (one every 6,400km) before a complete cycle is completed. In addition, every six months the required Ministry of Transportation (MTO) safety inspection is performed. All repair work is recorded on a manually-generated, numbered work order which includes the date, activity, labour hours and parts used. These documents are then filed by vehicle and regular summaries of vehicle and fleet maintenance costs produced.

The high number of different inspections can be confusing for the mechanical staff and can lead to "missed items". Consideration should given to moving oil changes to the same km's across the board – approximately 10,000km and reducing the number of PM inspections to two types and while co-ordinating the inspection intervals with the MTO inspection requirements. All high kilometre items, such as rear differential oil and transmission oil changes, can be included in the six-month MTO inspection cycle.

For recording in-service vehicle defects, the bus operator completes a pre-inspection/defect sheet which is numbered and if repairs are required, the pre-inspection sheet number is then transferred to a work order for tracking purposes and repairs are performed.

Heavy duty repairs such as major body overhauls, engine, transmission and differential overhauls are contracted out which is prudent considering the small size of the Sarnia operation.

Servicing and Cleaning

Fuelling and cleaning of all buses occurs each evening by a staff of three who are scheduled over a seven day period. If required, due to book-off, a spare board driver may be utilized in the service area.

Monday to Saturday the servicing starts in the pm and is normally completed by 12.30am, at which time the garage is closed. The garage reopens at 5.30am. On Sundays, the services are performed from noon until 8.30pm.

All vehicles are serviced daily which includes fuelling, exterior washing, sweeping, mopping, fluid checks, fare-box emptying and other duties. On alternate days, additional cleaning services are performed which are detailed on the vehicle cleaning sheets. The instruction sheets for the cleaning staff are very precise, however, the tasks that are required to be performed on days other then Monday to Friday are interspersed in the check list and can be confusing and easily missed. It may be of assistance if these items were on the bottom of the list or on a separate sheet with the appropriate day noted on top. The list can then be attached to the regular daily instructions.

A complete detailed interior clean of each vehicle is performed only once a year which is below industry practice. Most systems perform detailed cleaning a minimum of every three months. However, for Sarnia the lower frequency is due to the fact that parts of the interior are cleaned on an on-going basis on alternate days with the regular servicing program. Passenger and driver seats are, however, steam-cleaned and disinfected every three months.

A cursory inspection of vehicles both in the shop and on road all appeared to be clean on the exterior and that the interior floors, seats and ceilings were also in good, clean condition.

Parts Management

The stocking of spare parts including ordering, receiving, entry into the stock control system and stocking on shelves is handled by the Maintenance Supervisor. Access to parts follows what is commonly known as an "open stock-room" method whereby mechanics can obtain required parts from the stock-room and record the removed items on a "daily parts list". Further, mechanics also indicate on this sheet if a stock item is being depleted. This list is then checked by the Maintenance Supervisor and parts are reordered. Open stock-rooms are the norm for smaller systems like Sarnia Transit.

Most transit systems conduct an annual inventory of vehicles parts held in stock. Sarnia does not. An annual parts inventory should be considered as it offers a number of benefits to the organization in several areas:

- Total value of the parts inventory on hand;
- Budget forecasting regarding parts needs;
- Total value of parts compared to total value of parts issued during the year on work orders:
- Year over year comparison – in/decrease in parts purchasing and inventory value;
- A reconciliation of parts used compared to parts listed on work orders as an indication of both accuracy as well as potential theft; and
- An indication of unnecessary or obsolete parts on hand which should be disposed of.

5.3 Fare Collection

As noted in section 3.1, the City offers tickets and passes as alternative methods to cash for transit users to purchase transit trips. These fare media are distributed at the transit office on Michener Road and eight other locations around the city including City Hall and the Village of Point Edward municipal office. Transit staff are responsible for ticket and pass sales including ordering new supplies, receiving and filling orders, delivery to the sales outlets and invoicing clients.

The Transit Department uses manual fareboxes manufactured by Diamond Industries to collect transit fares on all buses. These fareboxes consist of an internal, secure cylinder which is removed each evening by the night staff, kept in a secure vault overnight, the contents emptied and money counted and packaged by office staff the following day. The money is then picked up by a security service for transportation to the bank

and deposit. Transit staff record the money collected including separating tickets from the cash and recording the number of tickets collected.

The continued use of manual fareboxes does limit the application of modern electronic technology as represented by electronic fareboxes and the use of state-of-the-art fare media such as smart cards and the collection and analysis of fare revenue and ridership data. The Department, therefore, is considering the purchase of electronic fareboxes which is being reviewed and assessed as part of the separate Technology (ITS) Needs Assessment task.

5.4 Marketing and Communications

Over the past decade, there has been a greater awareness of and focus on customer service and marketing in public transit. Like any other product or service, transit can attract more customers through an effective brand, persuasive marketing, and responsive customer service. Specifically, transit must be integrated into the community and be seen as an attractive mobility choice. The purpose of this section of the report is to review existing marketing and communications initiatives and identify opportunities for improvement with the goal of strengthening Sarnia Transit's image in the city.

Like most small communities, Sarnia Transit has limited customer service and marketing resources, primarily in what is seen as "core" functions: providing basic information on routes and schedules, answering customer enquiries telephone, and selling fare products. The primary "faces" of Sarnia Transit are its front-line operators who are tasked to not only operate vehicles safely, but also to greet customers, answer questions, and represent the system in a professional and courteous manner. Supporting the operators are Inspectors who monitor transit service and answer customer questions in person and office staff who also provide information as well as sell fare products through Sarnia Transit's telephone information line. The department's Director also fields enquiries, particularly from Council members and senior levels internally within the City, and represents transit at external functions, notably the Transit Advisory Committee and City Accessibility Committee. In addition to these duties, transit staff also manages the advertising space on buses and shelters including selling advertising.

The Director provides overall direction to the transit system's marketing and communications activities. There are no other City resources assisting the department in this area.

The 2012 transit budget had an allowance of approximately $16,000 for marketing, communications and advertising. This level of expenditure represents approximately 0.3% of the total operating budget. Normal expenditure guidelines for marketing and communications are 2% to 2.5% of budget.

Customer Information

The department provides a reasonable level of information to its customers through several methods. The main pieces of information regularly communicated to customers include:

- Route and schedule information;
- Fare information; and
- Service disruption information (including out of service or detour notices).

The following sections outline how this information is currently communicated.

Printed Materials

Sarnia Transit has a limited number of printed customer information products, most of which are in need of updating.

There is a separate route map and route schedule brochure, the latter providing detailed schedule times along each route. Because of the number of route network and route variations, the route map is quite difficult to use and understand as the amount of material required to be presented is complex. As a result, the transit message is confusing and discouraging to potential new users. This also reflects the challenge of having multiple route network variations. Similarly, the schedule brochure is large and cumbersome to use.

Any simplification of the transit route network and service variations resulting from this master plan study will help improve customer comprehension of the transit service and simplify the content and layout of the route map and schedule brochures. At that point, the two separate documents should be combined to present one single, easy-to-use source of transit information.

It should be noted, however, that the quality of graphic design of the printed materials, particularly the route map, is comparable to that seen in peer systems.

Transit periodically issues supplementary route and customer information on-board buses and through the City website. Transit does offer to arrange delivery of their map and schedule brochure to customers.

Signage and Notices

Bus stop signage is installed and maintained by transit and other City staff. When bus stops have been damaged, are being relocated or when new signs are being installed due to route changes, Transit provides temporary signage to inform users. This is an important and helpful practice.

Similarly, effective use is made of the three transit terminals to post notices of service changes as well as other transit-related information on the individual route signs and shelters on the platforms.

Notices for the information of employees, are regularly posted on various bulletin boards at the transit office.

On-Board

On-board buses, signage is posted by maintenance staff when service notices or other announcements are required. However, these notices are not tracked and some are not removed once they expire. A regular protocol to remove postings upon expiry is needed, potentially during the daily bus servicing process.

With the installation of the automated next bus stop announcement system (both audio and visual) on all vehicles, as well as the increased use of electronic destination signs, use could be made of these media to communicate messages to the public. However, as with other elements of general marketing and communications, resources are required to implement and manage this program

In Person

Transit provides route and schedule information and answers customer inquiries primarily by telephone and in person. The main telephone line (519-336-3271) provides a connection to the transit office where administrative staff or Inspectors/Dispatchers assist customers. Contact (email) information for the Director and Maintenance Supervisor (who is also the acting Operations Supervisor) is readily available on the City's website.

During non-service hours, or when the lines are busy, an automated answering service provides basic transit information. Above all, however, the bus operators provide important front-line assistance with existing and potential customers on the vehicles and at terminals.

Internet

Transit information can be accessed through a link on the City's website (http://www.sarnia.ca/transit). It features a wide range of information, including:

- Route and schedule information and maps;
- Up-to-date system map;
- Service updates, newsletters, and news releases;
- Fare rates and information;
- Links to charter and rental information;
- A link to the Care-A-Van service;
- Frequently asked questions;
- Contact information, including telephone, email, and mailing address; and

- Sarnia TripPlanner using Google Maps is available for on-line planning. It is a convenient way for people to plan their transit trip from origin to destination simply by entering their home location and destination.

Unfortunately, a number of the pages or links on the website have not been updated for quite some time. This reflects limited staff resources to maintain the many aspects of the website and other marketing and communications activities.

However, the City is in the process of introducing a new website which should include updated transit information.

In future, Sarnia Transit, and the City, will need to become more active in social media since this is the primary communications media for younger adults.

Corporate Image

The Transit corporate image, as presented on the transit vehicles, stops and print material has been refreshed over the past several years. However, the general appearance and particularly the transit logo, is dated. Also, there is a lack of consistency between in messaging and application of the transit corporate image between the buses, bus stop sign designs and print materials. Consideration should be given to developing a new corporate image and logo for transit as part of the overall strategy to reinforce the importance of transit in the community.

Current Marketing and Communications Initiatives

Through the Master Plan study and ITS component, Sarnia Transit will be developing a strategy to augment some of the existing customer information and technical resources they now have, such as the GPS based “next stop announcement” system. This could lead to offering real-time next vehicle arrival information via the web, SMS text messaging and displays at key stops and terminal locations. Other initiatives could include *cameras on vehicles* to enhance security and serve as a deterrent against criminal behaviour and to provide evidence should a crime take place on board a bus.

5.5 Accessibility

The City’s conventional transit service has been moving towards full accessibility as the fleet is renewed with either low-floor ramp-equipped or high-floor, lift-equipped buses. However, the service currently does not accept people who use wheelchairs or scooters. The primary reason for non-acceptance is the anticipated negative impact on transit route schedules due to the time that can be required for a person using a wheelchair or scooter to board or exit a vehicle.

Under the Province’s Accessibility for Ontarians with Disabilities Act (AODA) which became law in 2005 as well as other Ontario and human rights legislation and associated rulings, it is intended that all public services, including public transit, be made fully accessible to people with disabilities as soon as possible. The Province also mandated in 1996, as a condition of using public funds (provincial, municipal) for public transit, that all buses purchased since 1996 have had to be accessible. Thus, the purchase of accessible transit buses is a core part of making transit services accessible.

Under these conditions and principles, it is expected that conventional transit services, specifically, should allow people who use mobility aids such as wheelchairs and scooters to use the service regardless of whether or not the

municipality has a parallel, specialized transit service. Conventional transit services provide people who use mobility aids with greater flexibility in meeting their transportation needs as well as affording them greater integration into society. Financially, emphasizing greater use of conventional transit service instead of the higher cost specialized transit service is a sensible strategy for efficiently investing the available transit financial resources by any municipality.

For these reasons, Sarnia should adopt a plan to make its conventional transit service fully accessible as soon as practical. This is detailed in section 8.

6. Needs and Opportunities

The review and assessment of the Sarnia's conventional transit service detailed in the previous sections indicate the following needs and opportunities for improvement.

Markets

- The key future markets for increasing transit use will be high school and college students, workers and seniors.

Route Network and Service Levels:

- The transit system's service standards should be updated to reflect the current operating context;
- Increase service to high ridership corridors including Exmouth and Devine;
- The transit route network needs to be restructured to better reflect travel patterns such as north-south and to improve service to major destinations – Lambton College, Lambton Mall, Walmart. System would continue to emphasize service to the downtown as it is the cultural heart of the city;
- Improve service to employment areas in the south end of city, including measures to improve ridership to Chemical Valley. Routes currently do not provide good north-south orientation that would better suit work-based trips;
- Improve on-time performance by reducing the system average speed and allow flexibility to give operators opportunity to continue high level of customer service and accessibility while meeting scheduled run times;
- Provide options to serve growth areas including phasing options; and
- Develop options to increase ridership in north end where routes are under-performing.

Terminals:

- Establish new terminals with enhanced passenger amenities with locations reflecting changes to the system route structure;

ITS

- Use emerging technologies to improve communications/information sharing with customers, track on–time performance. This issue is being reviewed and assessed as a separate report.

Department:

- Restructure transit department to focus on core functional areas such as operations and administration and to improve employee supervision and monitoring and responsibility distribution; review union representation with objective of harmonizing representation and excluding supervisory personnel.

Infrastructure:

- Buses – adopt fleet replacement plan and review vehicle size strategy; reduce spare ratio through greater standardization of fleet;

- Terminals – need to improve customer amenities; implement as part of site selection for terminals. Enhance downtown transit amenities;

- Bus stops – re-design markers/signs to be distinctive; review number and location of stops; assess for AODA compliance; develop plan for making stops accessible; and

- Shelters – adopt regular program for repair and cleaning; increase number of shelters to target of 25% of stops; adopt location selection criteria.

General:

- The Transit Service Area (TSA) by-law should be either updated or reviewed for continued relevance

- Vehicle Maintenance – simplify inspection/servicing intervals;

- Transit-Supportive Policies; review parking rates and relationship to cost to use transit; and

- Accessibility – develop plan to accept wheelchairs and scooters on Sarnia Transit.

These opportunities form the basis for the Short and Long Term Service plan presented in Section 7 below.