ENTRA
CONSULTANTS

Appendices

A. Summaries of Online Surveys
B. Service Planning Guidebook

Appendix A

Summaries of Online Surveys

Summary of Online Survey

1. Introduction

Surveys were developed and posted online in an effort to understand current transportation issues and needs, existing travel patterns and characteristics throughout the County of Essex as well as residents perspective on potential transit services. Separate surveys were created for the public, major employers and key stakeholders. A total of 191 responses were received from the public, followed by 54 responses from employers and 17 responses from stakeholders. The following sections summarize key questions of the public, employer and stakeholder survey results.

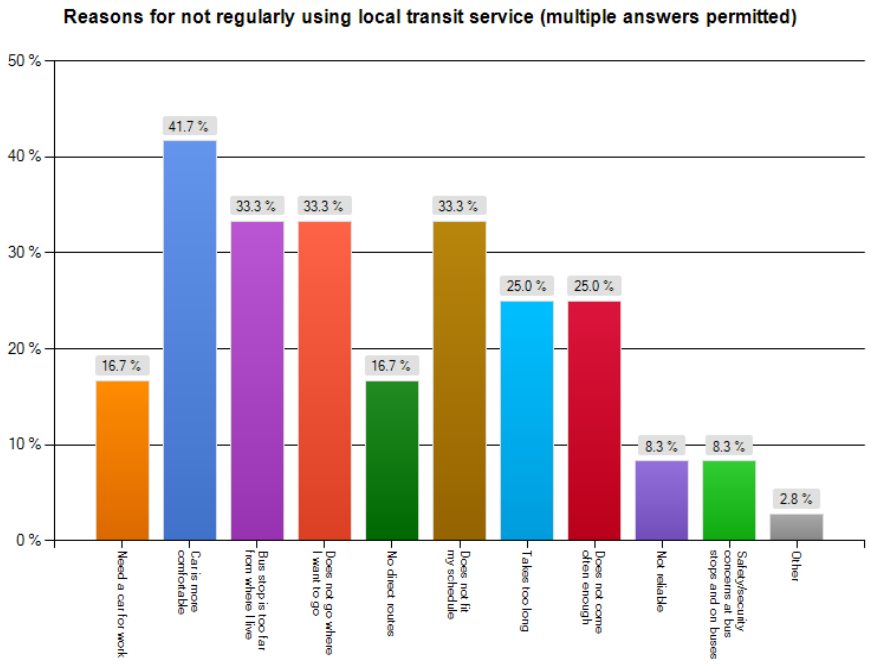
2. County of Essex Public Survey

The public survey was developed to obtain community input on transit needs throughout the County and was available on County and local websites. A paper version of the survey was also made available at locations throughout the region including the County of Essex Library and at a Public Information Centre held on September 30, 2009, in the Town of Essex.

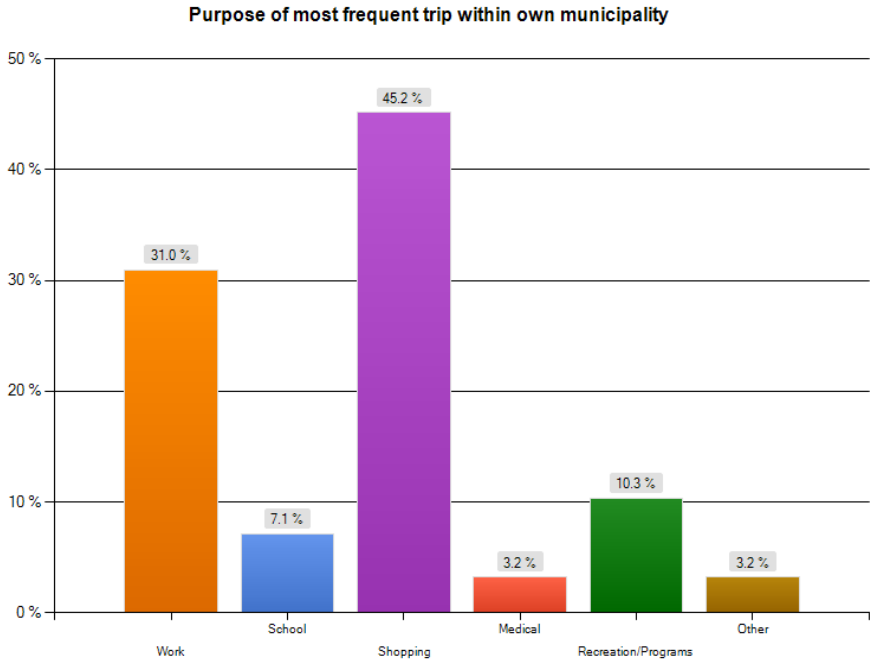
Place of residence – Survey responses were received from all municipalities of the County, but not in proportion to populations throughout the County. The Town of Essex makes up 11.3 percent of the County of Essex population and provided 22.9 percent of public survey responses. Conversely, the Municipality of Leamington makes up 16.3 percent of the County of Essex population yet provided only 4.6 percent of public survey responses.

	Percentage of Population from Census (2006)	**Percentage of Place of Residence of Respondents**
Amherstburg	12.3%	16.0%
Essex	11.3%	22.9%
Kingsville	11.8%	13.1%
LaSalle	15.7%	9.1%
Leamington	16.3%	4.6%
Lakeshore	18.8%	22.9%
Tecumseh	13.7%	11.4%
Total	100.0%	100.0%

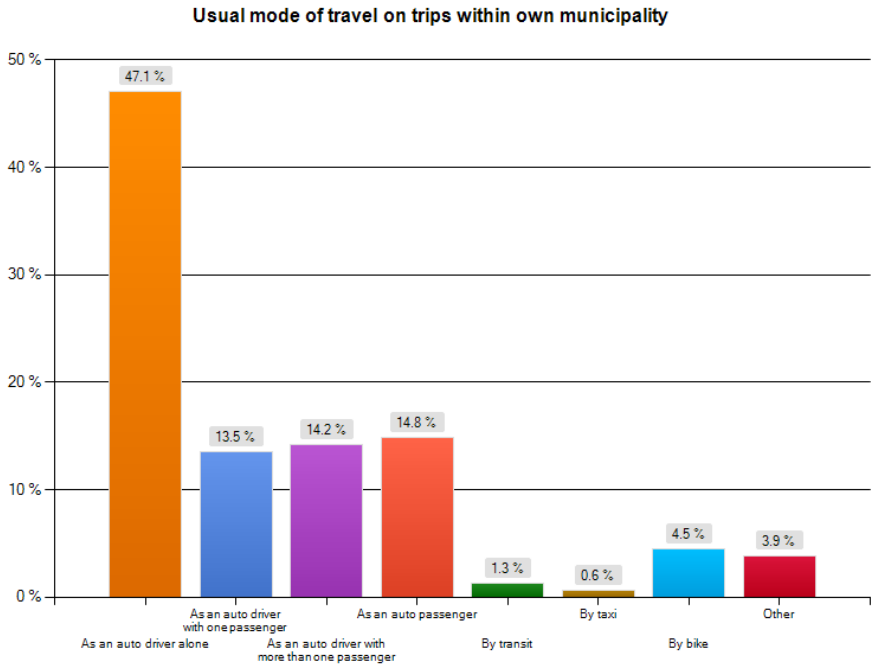
Reasons for not using transit – This question was designed for residents living in municipalities where transit services are already available such as Leamington and LaSalle. “Car is more comfortable” was selected by 41.7 percent of respondents as the most frequent reason not using local transit service. “Bus stop is too far from where I live”, “Does not go where I want to go”, “Does not fit my schedule”, “Takes too long” and “Does not come often enough” were also selected by at least 25 percent of respondents as reasons for not using transit. “Safety concerns” and “Not reliable” were the reasons with the fewest response at 8.3 percent each.



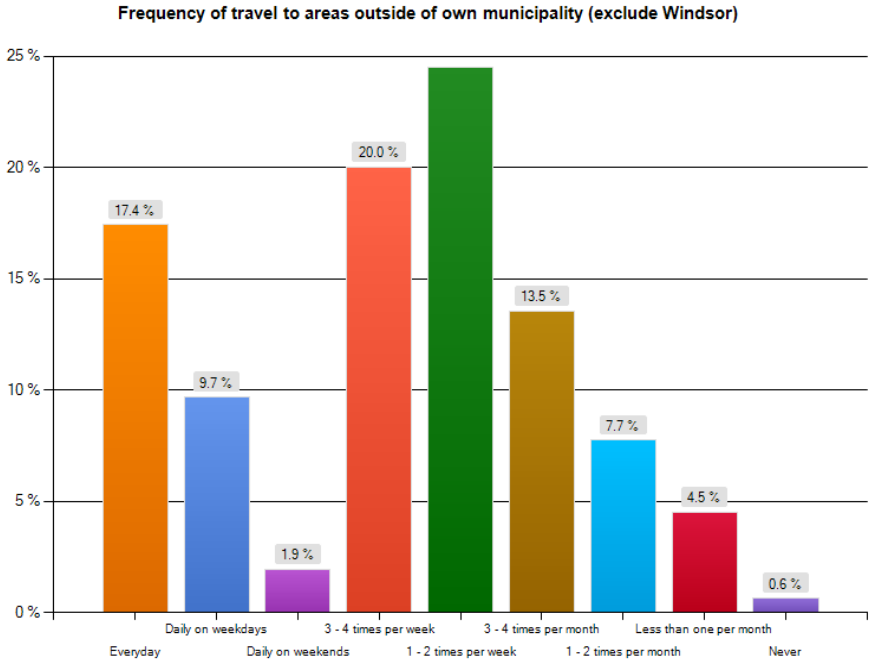
Purpose of most frequent trip within own municipality – "Shopping" was selected by 45.2 percent of respondents as the most frequent trip purpose within their own municipality, and "Shopping" and "Work" together represent more than 76 percent of respondent trips within their own municipalities. The fewest respondent trips taken within their own municipalities are for "Medical" purposes, at only 3.2 percent.



Usual mode of travel on trips within own municipality – Nearly 90 percent of respondent trips within their own municipality are made by car as a driver or passenger and more than 47 percent are made as an auto driver alone. Only 1.3 percent of respondent trips within their own municipality are made by public transit.

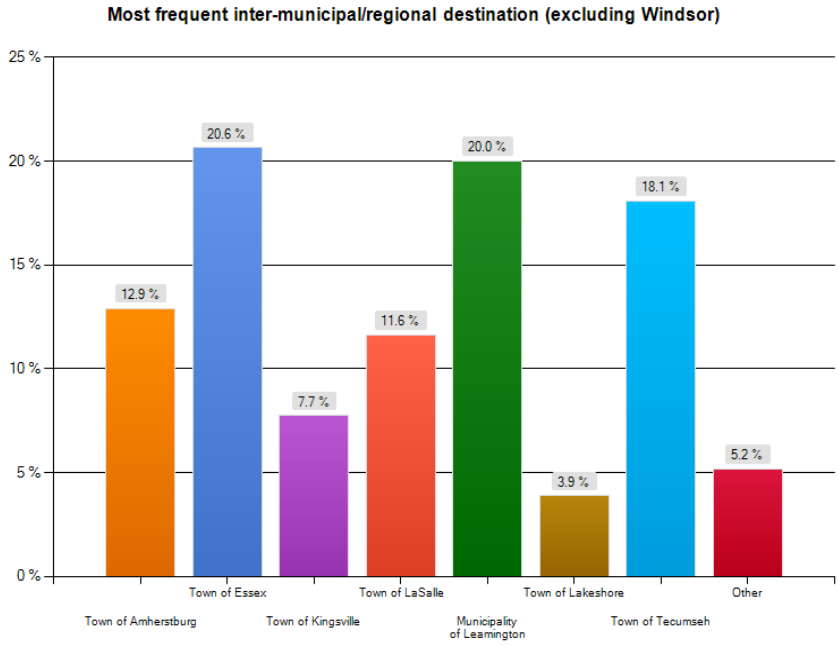


Frequency of travel to areas outside own municipality (excluding Windsor) – Approximately 74 percent of respondents travel to areas outside their own municipality at least one to two times per week (excluding Windsor). More than 27 percent travel to areas outside their of own municipality every weekday (excluding Windsor). Less than 1 percent of respondents stated that they “Never” travel to areas outside their own municipality.

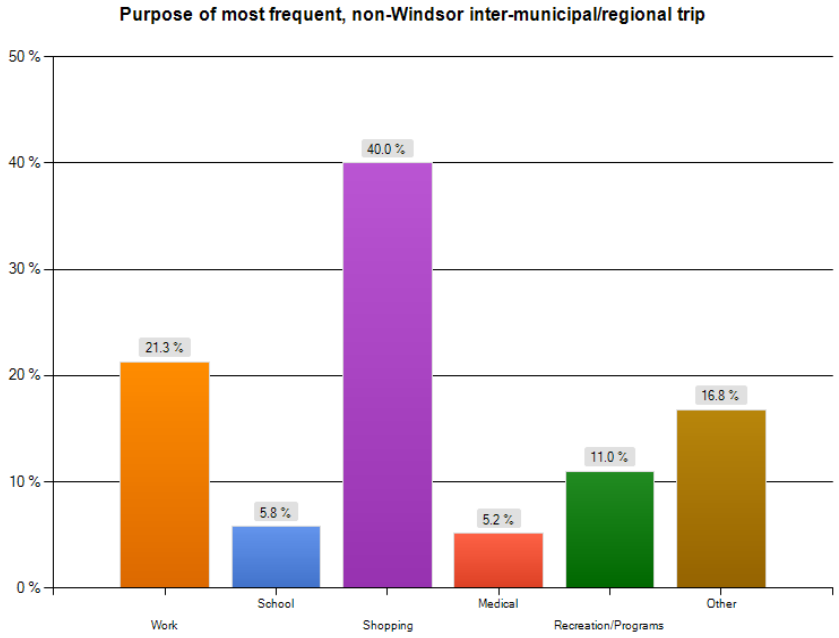


Most frequent inter-municipal/regional destination (excluding Windsor) – The Town of Essex, Leamington and Tecumseh are the most frequent inter-municipal/regional destinations of respondents, and represent approximately 60 percent of inter-

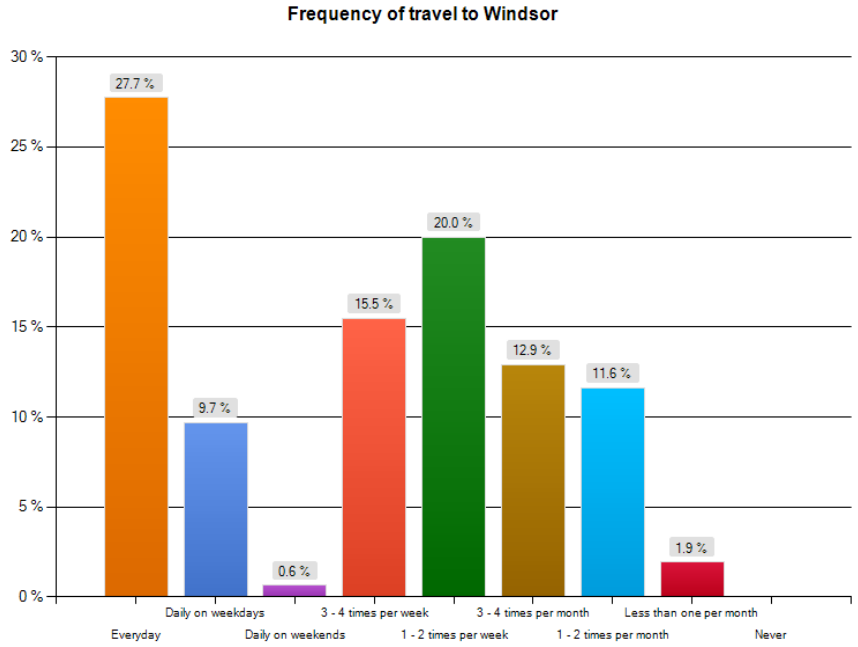
municipal/regional travel (excluding Windsor). Lakeshore was selected by 3.9 percent of respondents and is the least frequent inter-municipal/regional destination (excluding Windsor).



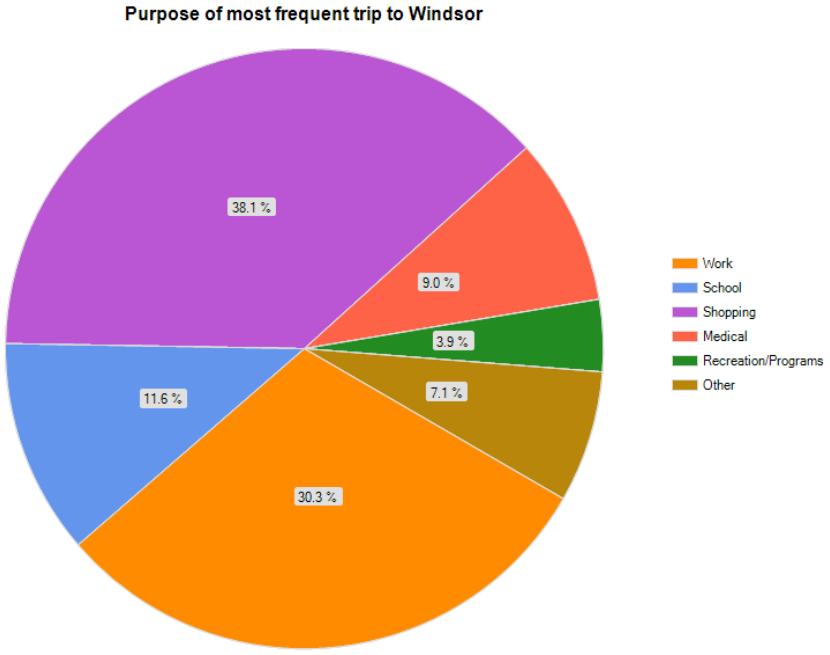
Purpose of most frequent, non-Windsor inter-municipal/regional trip – "Shopping" was selected by 40 percent of respondents as the most frequent trip purpose for inter-municipal/regional travel. "Shopping" and "Work" together account for 61.3 percent of inter-municipal/regional trips. "Medical" and "School" are the least frequent purposes for inter-municipal/regional trips at 5.2 percent and 5.8 percent respectively.



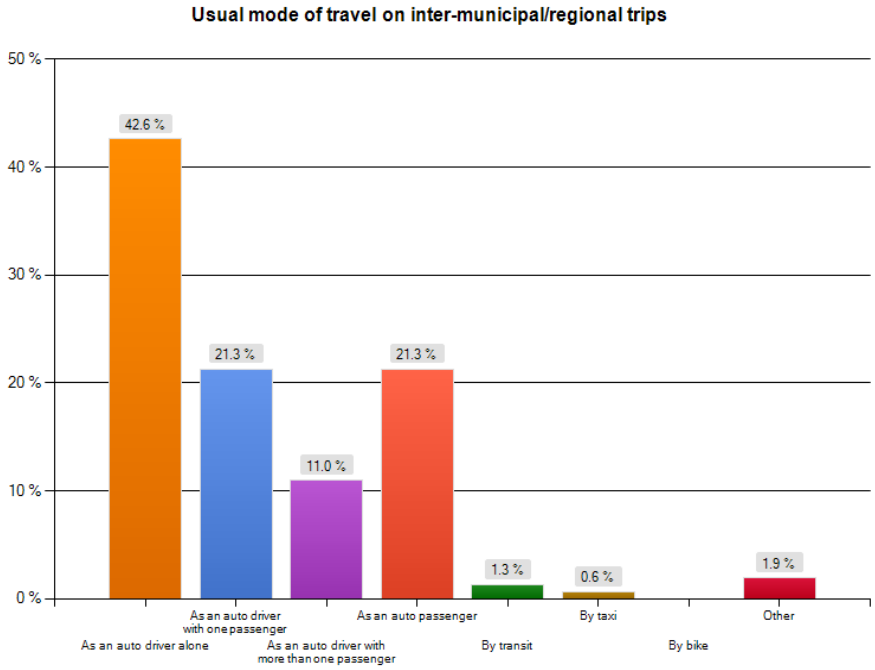
Frequency of travel to Windsor – More than 37 percent of respondents travel to Windsor daily on weekdays, and approximately 74 percent travel to Windsor at least one to two times per week. Only 13.5 percent travel to Windsor one to two times per month or less.



Purpose of most frequent trip to Windsor – "Shopping" was selected by 38.1 percent of respondents as the purpose of their most frequent trip to Windsor. "Shopping" and "Work" together accounted for 68.4 percent of trips to Windsor. "Recreation/Programs" were selected by only 3.9 percent of respondents as the purpose of their most frequent trip to Windsor.



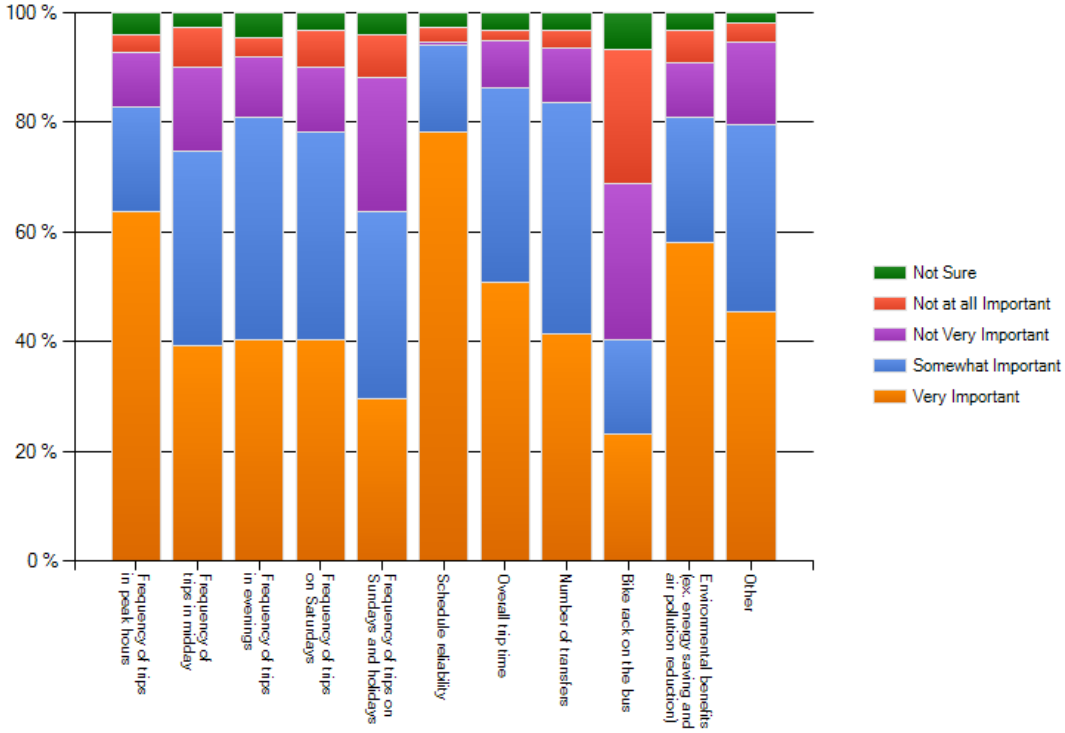
Usual mode of travel on inter-municipal/regional trips – More than 96 percent of inter-municipal/regional respondent trips are made by car as a driver or passenger and nearly 43 percent are made as an auto driver alone. Only 1.3 percent of inter-municipal/regional respondent trips are made by public transit.



Access to Vehicle for Travel – Nearly 81 percent of respondents usually have access to a vehicle for their travel.

Importance of service features or other factors on decision to use transit (if provided) – "Schedule reliability" was the most frequently identified as "Very Important" influence on the decision to use transit and was selected by more than 78 percent of respondents. "Frequency of trips in peak hours", "Environmental benefits", and "Overall trip time" were also selected as "Very Important" by more than 50 percent of respondents. "Bike rack on bus" was selected by 53 percent of respondents as a "Not Very Important" or "Not at all important" influence on their decision whether or not to use transit.

Rate the importance of the following service features or other factors on your decision whether or not to use transit service (if it were provided)

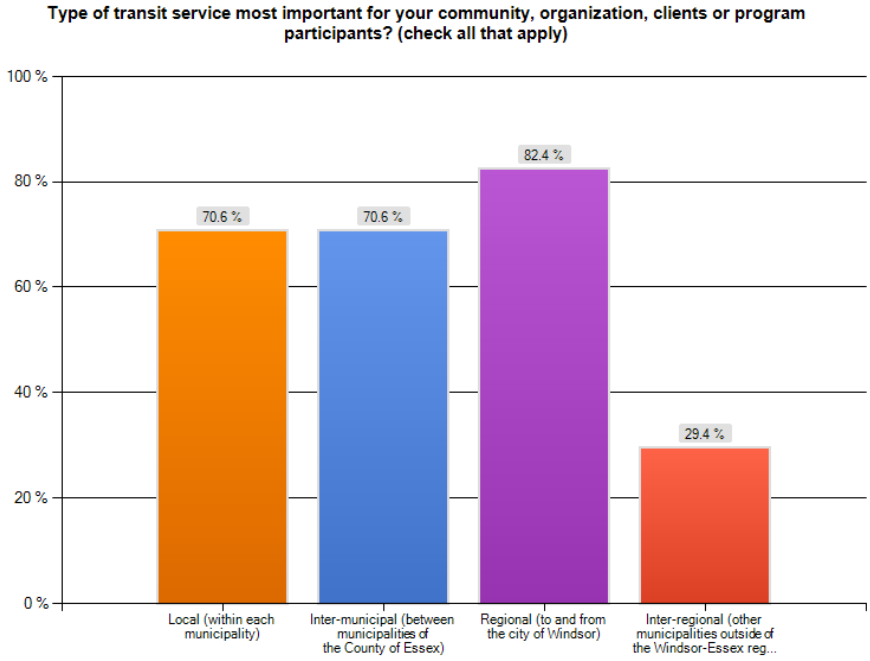


3. County of Essex Stakeholder Survey

The stakeholder survey was developed to obtain input regarding transit needs of the region from stakeholders. Stakeholders were contacted and invited to participate in the survey online.

View of changing needs and markets over the next five years – More than 88 percent of respondents believe needs and markets will be growing in the next five years while none believe there will be a decline. Approximately 12 percent of stakeholder respondents selected “Don’t know”.

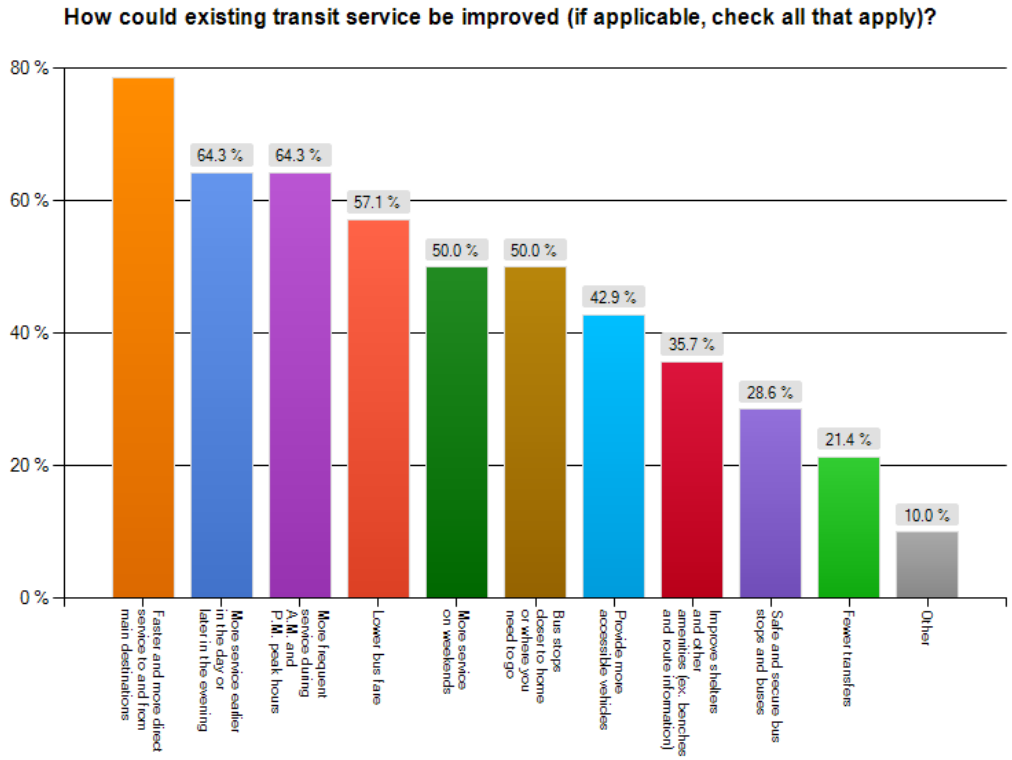
Type of transit service most important for the community, organization, clients or program participants of the stakeholder – “Regional (to and from the City of Windsor)” service was identified as the most important transit service by 82.4 of stakeholder respondents. “Local (within each municipality)” and “Inter-municipal (between municipalities of the County of Essex)” were also considered to be important by 70.6 percent of respondents. Only 29.4 percent identified “Inter-regional (other municipalities outside of the Windsor-Essex region)” as an important type of transit service.



Transportation barriers – More than 88 percent of stakeholder respondents feel transportation is a barrier for their community, organization, clients or program participants. Approximately 12 percent feel transportation is not a barrier.

Existing transit service and transportation needs of community, organization, clients or program participants – More than 88 percent of respondents feel existing transit service does not meet the transportation needs of their community, organization, clients or program participants. Approximately 12 percent feel that existing transit service meets transit need.

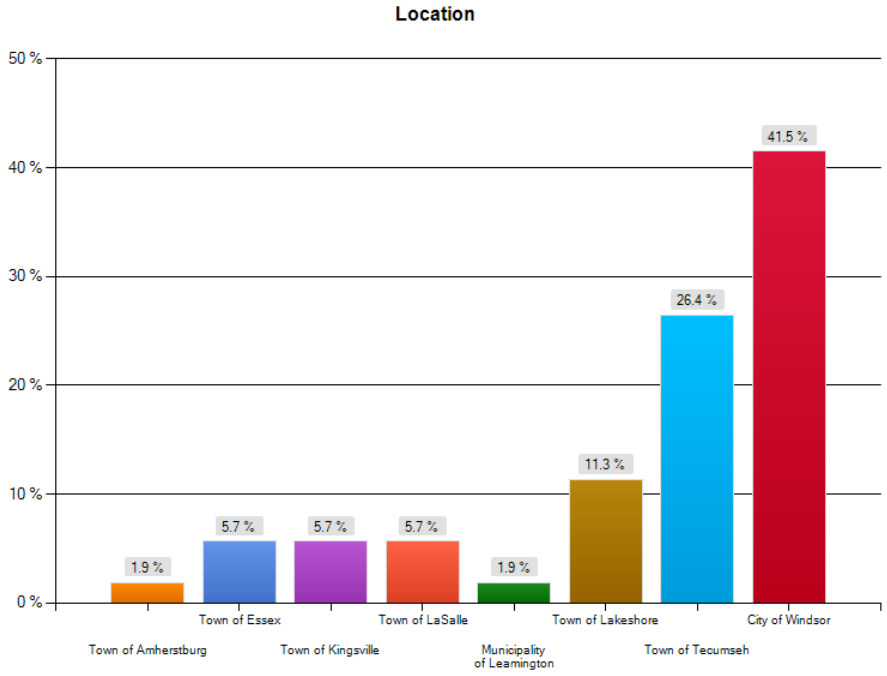
How to improve existing transit service – More than 79 percent of respondents indicated that transit service could be improved via “Faster and more direct service to and from main destinations”. “More service early in day/late in evening” and “More frequent service during A.M/P.M peak hours” were also identified by at least 64 percent of respondents as ways to improve existing transit service. “Fewer transfers” only received 21.4 percent of responses as a way to improve existing transit service.



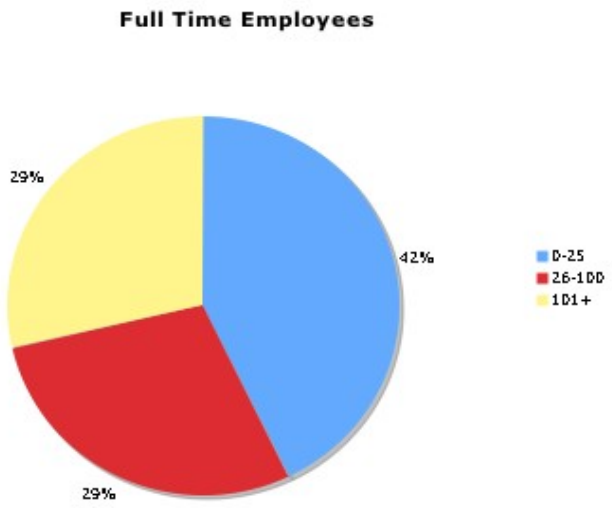
4. County of Essex Employer Survey

The employer survey was developed to obtain input regarding transit needs from major regional employers. Employers were contacted and invited to participate in the survey online.

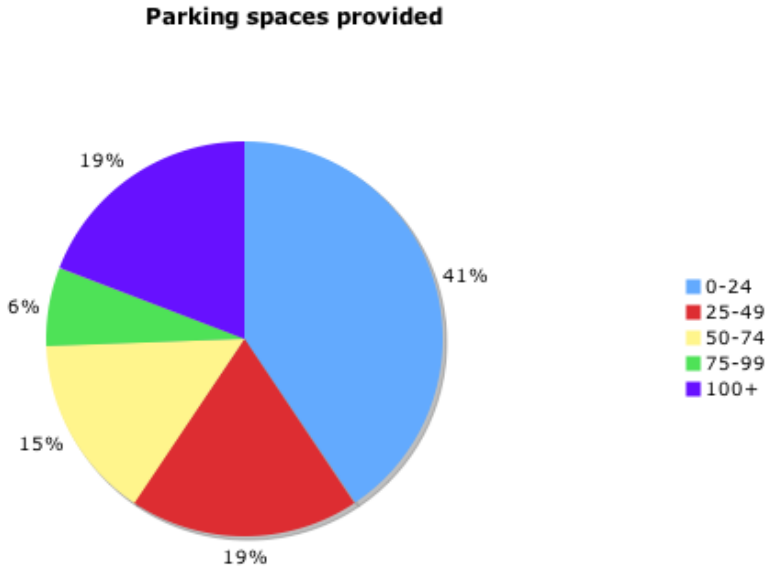
Location – Approximately 68 percent of employer respondents were located in Windsor and Tecumseh. Employers in Leamington and Amherstburg provided only 1.9 percent of survey responses each.



Full time employees – Approximately 58 percent of employers have more than 25 employees while 42 percent employ between 0 and 25 people. The average number of respondent employees was 80.



Parking spaces provided – Sixty (60) percent of employers provide between 0 and 49 parking spaces for their employees and 19 percent provide more than 100 spaces.



Charge for parking or limiting parking availability – More than 96 percent of employers do not charge or limit parking availability. Less than 4 percent of employers charge or limit parking availability.

Staff retention and transit – Nearly 87 percent of employers indicated that a lack of transportation alternatives is not a factor in staff retention. Approximately 13 percent felt that a lack of transportation alternatives is a factor in staff retention.

Transportation service or support provided for employees – More than 98 percent of employers do not provide transportation services or support for their employees (such as a ride-home service, transit subsidies or an employee shuttle).

Appendix B

Service Planning Guidebook

Transit Service Planning Guidebook

1. Guidebook Instructions

1.1 Introduction

This guidebook provides step-by-step instructions on how to develop a service design and to determine whether the proposed service is within the acceptable threshold as defined by the Performance Standards. This document will demonstrate how to compute the selected metrics (e.g. passengers per hour, hours per capita) to examine whether the proposed services meet established standard thresholds.

Each transit service proposal begins with the development of a service design. A service design comprises all the variables that dictate a proposed transit service. Typical service design components include (but not limited to):

1. Type of service
2. Route alignment and stop location
3. Span of service
4. Service frequency

In most cases, transit service levels are adjusted according to demand and vary depending on the type (e.g. weekday, Saturday, Sunday) and time of day (e.g. AM peak, midday, etc). Thus, service designs are usually developed on a period-by-period basis. Typically, transit service periods are defined as outlined in Exhibit 1 but may be altered according to local demand.

Exhibit 1: Transit Service Periods

Monday to Friday	
AM Peak	6:00 am to 9:00 am
Midday	9:00 am to 3:00 pm
PM Peak	3:00 pm to 6:00 pm
Evening	After 6:00 pm
Saturday	
Morning	6:00 am to 12:00 pm
Afternoon	12:00 pm to 6:00 pm
Evening	After 6:00 pm
Sunday	
Morning	6:00 am to 12:00 pm
Afternoon	12:00 pm to 6:00 pm
Evening	After 6:00 pm

1.2 Developing a Service Design

The first step to develop a service design is to identify a route alignment. This could be conducted through the use of Google Maps or Bing Maps[1]. Once the route alignment has been identified, the worksheet illustrated in Exhibit 2 can be used to develop the remaining components of the service design.

In this worksheet, you will indicate the type and level of service by time period. A number of different service designs may be required to strike a balance between serving customer needs and financial sustainability.

[1] Note: The distance measurements within from these web applications may not be entirely accurate. The use of GIS software will provide more accurate results.

Exhibit 2: Service Design Worksheet

Route Name	**(1)**								
Round Trip Distance	**(2)**	km							
Service Type	**(3)**	Urban Connectors							
		County Connectors							
		Local Services							
		Rural Services							
Time Period	Type of Service Operation		Level of Service (minutes) **(5)**						
	✓		15	20	30	60	90	Other (Specify)	
Monday-Friday									
AM Peak	**(4)**	Fixed Route / Schedule							
		Demand Response	Not Applicable						
		No Service							
Midday		Fixed Route / Schedule							
		Demand Response	Not Applicable						
		No Service							
PM Peak		Fixed Route / Schedule							
		Demand Response	Not Applicable						
		No Service							
Evening		Fixed Route / Schedule							
		Demand Response	Not Applicable						
		No Service							

Saturday								
Morning		Fixed Route / Schedule						
Sunday								
Morning		Fixed Route / Schedule						

Step by Step

(1)	Identify a route name
(2)	Determine the round trip route distance (km), based on the proposed route alignment
(3)	Check off the appropriate service type according to the definitions in Service Concept section
(4)	Check off the appropriate type of service operation for each individual service period
(5)	Check off the appropriate level of service (min) for each individual service period

1.3 Evaluating Consistency with Ridership Standard

Once the Service Design Worksheet is completed, you will complete a Ridership Calculation Worksheet. This worksheet will allow you to determine whether the proposed service is within the outlined Performance Standard for ridership.

Exhibit 3: Ridership Calculation Worksheet

	Monday-Friday			**Saturday**	**Sunday**
	AM Peak	Midday	PM Peak	Morning	Morning
Calculating Transit Trips					
Total Trips – All Modes	**(1)** trips	trips			trips
Percent of Transit Modal Share	**(2)** %	%			%
Estimated Total Trips – Transit	**(3)** trips	trips			tr
Calculating Round Trip Time					
Round Trip Distance	**(4)** km	km			km
Estimated Vehicle Speed	**(5)** km/h	km/h			km/h
Estimated Round Trip Time	**(6)** h	h			h
Calculating Riders Per Revenue Hour					
Proposed Service Interval	**(7)** mins	mins			mins
Vehicle-trips Per Period	**(8)** trips	trips			trips
Vehicles-hours Per Period	**(9)** h	h			h
Riders Per Revenue Hour	**(10)**				
Abide with Service Standard **(11)**	☐ Above Std ☐ Below Std	☐ Above Std ☐ Below Std	☐ Above Std ☐ Below Std	☐ Above Std ☐ Below Std	☐ Above Std ☐ Below Std

Step by Step

(1)	Indicate the number of total trips (from all modes) made along the proposed route within the specified time period from the county's Transportation Forecasting Model
(2)	Indicate the estimated percent of transit's modal share Transit's modal share would likely range from 0-5% depending on the area being served, the extent of convenient transit connections, and the maturity of the transit system
(3)	Multiply **(1)** by **(2)**
(4)	Indicate the route trip distance (km) of the proposed route, as already specified from the Service Design Worksheet
(5)	Indicate the estimated vehicle operating speed of the route In Urban Areas, operating speeds could range from 15 to 25 km/h depending on the frequency of stops along the route and traffic conditions In Rural Areas, operating speeds could range from 25 to 50 km/h depending on the frequency of stops along the route
(6)	Divide **(4)** by **(5)**
(7)	Identify the proposed service interval (mins), as already specified in the Service Design Worksheet
(8)	Divide 60 by **(7)** and multiply the answer by the span of service (h) in that period Span of service example: if the proposed route operates during the entire duration of AM peak as outlined in Exhibit 25, the service will operate for 3 hours
(9)	Multiply **(8)** by **(6)**
(10)	Divide **(3)** by **(9)**
(11)	Check off whether the figure calculated in **(10)** is above or below the outlined standards

1.4 Evaluating Consistency with Amount of Service Standard

Once the Ridership Calculation Worksheet is completed, you will complete an Amount of Service Calculation Worksheet. This worksheet will allow you to determine whether the proposed service is within the outlined Performance Standard for amount of service in a defined service area.

Exhibit 4 - Amount of Service Calculation Worksheet

Population Coverage (1)					
	Monday-Friday		**Saturday**	**Sunday**	**Total**
	AM Peak	Midday	Morning	Morning	
Calculating Annual Vehicle Hours					
Vehicle-hours Per Period	**(2)** h			h	h **(3)**
Number of Weeks Per Year					52
Annual Vehicle Hours					h **(4)**
Calculating Vehicle Hours Per Capita					
Vehicle Hours Per Capita					**(5)**
Abide with Service Standard					Above Std
					Below Std **(6)**

Step by Step

(1)	Indicate the population in which the proposed route will serve Typically, the service area coverage is defined by areas within 500 metres along the proposed route
(2)	Indicate the number of vehicle hours per period for each period, as already specified in the Ridership Calculation Worksheet
(3)	Create a subtotal for weekday vehicle hours by multiplying the sum of Monday-Friday Vehicle-hours Per Period by 5 (the number of weekdays)

	Add the vehicle hours from the weekday subtotal, Saturday, and Sunday to obtain the number of vehicle-hours per week
(4)	Multiply **(3)** by 52 to obtain the annual vehicle hours for the proposed route Note: This calculation does not account for changes to schedules during holidays. Most transit agencies operate reduced service on the 10 recognized holidays in Ontario.
(5)	Divide **(4)** by **(1)** to obtain the vehicle hours per capita
(6)	Check off whether the figure calculated in **(5)** is above or below the outlined Service Standards

2. Sample Calculation

This section provides an example of a hypothetical transit service proposal for the Essex County. The purpose of this sample calculation is to better understand how the described worksheets can be used for transit service decision making.

In this example, an Essex County planner proposes to provide transit services connecting Lakeshore and Tecumseh communities to the Tecumseh Mall Transit Terminal in Windsor. Exhibit 29 illustrates the alignment of a proposed route. Exhibit 30 to Exhibit 32 show how the worksheets are completed and evaluated.

Exhibit 1 - Alignment of Proposed Route

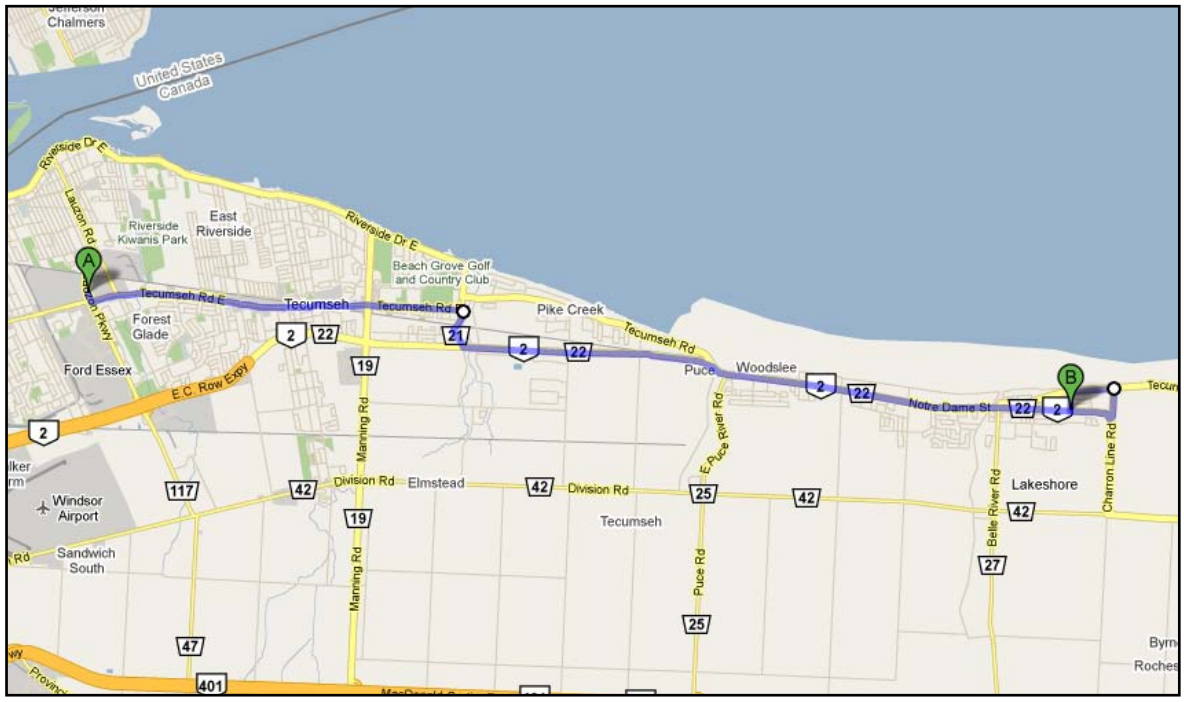


Exhibit 6 - Example of Completed Service Design Worksheet

Route Name	Route 1: Lakeshore-Tecumseh-Windsor							
Round Trip Distance	45.8 km							
Service Type	✓	Urban Connector						
		County Connector						
		Local Service						
		Rural Service						
Time Period	Type of Service Operation		Level of Service (minutes)					
	✓		15	20	30	60	90	Other (Specify)
Monday-Friday								
AM Peak	✓	Fixed Route / Schedule			✓			
		Demand Response	Not Applicable					
		No Service						
Midday	✓	Fixed Route / Schedule				✓		
		Demand Response	Not Applicable					
		No Service						
PM Peak	✓	Fixed Route / Schedule			✓			
		Demand Response	Not Applicable					
		No Service						
Evening		Fixed Route / Schedule						
		Demand Response	Not Applicable					
	✓	No Service						

Saturday									
Morning		Fixed Route / Schedule							
		Demand Response	Not Applicable						
	✓	No Service							
Afternoon		Fixed Route / Schedule							
		Demand Response	Not Applicable						
	✓	No Service							
Evening		Fixed Route / Schedule							
		Demand Response	Not Applicable						
	✓	No Service							
Sunday									
Morning		Fixed Route / Schedule							
		Demand Response	Not Applicable						
	✓	No Service							
Afternoon		Fixed Route / Schedule							
		Demand Response	Not Applicable						
	✓	No Service							
Evening		Fixed Route / Schedule							
		Demand Response	Not Applicable						
	✓	No Service							

Exhibit 7 – Example of Completed Ridership Calculation Worksheet

	Monday-Friday				**Saturday**			**Sunday**		
	AM Peak	Midday	PM Peak	Evening	Morning	After-noon	Evening	Morning	After-noon	Evening
Calculating Transit Trips										
Total Trips – All Modes	12,130 trips	9,450 trips	14,900 trips	trips	trips	trips	trips	trips	trips	trips
Percent of Transit Modal Share	2.0 %	2.0 %	2.0 %	%	%	%	%	%	%	%
Estimated Total Trips – Transit	243 trips	189 trips	298 trips	trips	trips	trips	trips	trips	trips	trips
Calculating Round Trip Time										
Round Trip Distance	46 km	46 km	46 km	km	km	km	km	km	km	km
Estimated Vehicle Speed	25 km/h	25 km/h	25 km/h	km/h	km/h	km/h	km/h	km/h	km/h	km/h
Estimated Round Trip Time*	2 h	2 h	2 h	h	h	h	h	h	h	h
Calculating Riders Per Revenue Hour										
Proposed Service Interval	30 mins	60 mins	30 mins	mins	mins	mins	mins	mins	mins	mins
Vehicle-trips Per Period	6 trips	6 trips	6 trips	trips	trips	trips	trips	trips	trips	trips
Vehicles-hours Per Period	12 h	12 h	12 h	h	h	h	h	h	h	h
Riders Per Revenue Hour	20 riders	16 riders	25 riders	riders	riders	riders	riders	riders	riders	riders
Abide with Service Standard	✓ Above Std Below Std	✓ Above Std Below Std	✓ Above Std Below Std	Above Std Below Std	Above Std Below Std	Above Std Below Std	Above Std Below Std	Above Std Below Std	Above Std Below Std	Above Std Below Std

* Calculation of estimated round trip time includes provision for recovery time. Recovery time is defined as time that is added to the pure running time (1) to enable a vehicle to make up small delays and (2) to adjust travel time to be compatible with proposed service intervals.

Exhibit 8 – Example of Completed Amount of Service Calculation Worksheet

Population Coverage	39,000										
	Monday-Friday				**Saturday**			**Sunday**			**Total**
	AM Peak	Midday	PM Peak	Evening	Morning	After-noon	Evening	Morning	After-noon	Evening	
Calculating Annual Vehicle Hours											
Vehicles-hours Per Period	12 h	12 h	12 h	h	h	h	h	h	h	h	180 h
Number of Weeks Per Year											52
Annual Vehicle Hours											9,360 h
Calculating Vehicle Hours Per Capita											
Vehicle Hours Per Capita											0.24 hrs/cap
Abide with Service Standard											✓ Above Std Below Std

3. Worksheet Templates

Service Design Worksheet

Route Name								
Route Distance		km						
Service Type		Urban Connectors						
		County Connectors						
		Local Services						
		Rural Services						
Time Period	Type of Service Operation		Level of Service (minutes)					
	✓		15	20	30	60	90	Other (Specify)
Monday-Friday								
AM Peak		Fixed Route / Schedule						
		Demand Response	Not Applicable					
		No Service						
Midday		Fixed Route / Schedule						
		Demand Response	Not Applicable					
		No Service						
PM Peak		Fixed Route / Schedule						
		Demand Response	Not Applicable					
		No Service						
Evening		Fixed Route / Schedule						
		Demand Response	Not Applicable					
		No Service						

Saturday								
Morning		Fixed Route / Schedule						
		Demand Response	Not Applicable					
		No Service						
Afternoon		Fixed Route / Schedule						
		Demand Response	Not Applicable					
		No Service						
Evening		Fixed Route / Schedule						
		Demand Response	Not Applicable					
		No Service						
Sunday								
Morning		Fixed Route / Schedule						
		Demand Response	Not Applicable					
		No Service						
Afternoon		Fixed Route / Schedule						
		Demand Response	Not Applicable					
		No Service						
Evening		Fixed Route / Schedule						
		Demand Response	Not Applicable					
		No Service						

Ridership Calculation Worksheet

	Monday-Friday				**Saturday**			**Sunday**		
	AM Peak	Midday	PM Peak	Evening	Morning	Afternoon	Evening	Morning	Afternoon	Evening
Calculating Transit Trips										
Total Trips – All Modes	trips	trips	trips	trips	trips	trips	trips	trips	trips	trips
Percent of Transit Modal Share	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**
Estimated Total Trips – Transit	trips	trips	trips	trips	trips	trips	trips	trips	trips	trips
Calculating Round Trip Time										
Round Trip Distance	km	km	km	km	km	km	km	km	km	km
Estimated Vehicle Speed	km/h	km/h	km/h	km/h	km/h	km/h	km/h	km/h	km/h	km/h
Estimated Round Trip Time*	h	h	h	h	h	h	h	h	h	h
Calculating Riders Per Revenue Hour										
Proposed Service Interval	mins	mins	mins	mins	mins	mins	mins	mins	mins	mins
Vehicle-trips Per Period	trips	trips	trips	trips	trips	trips	trips	trips	trips	trips
Vehicles-hours Per Period	h	h	h	h	h	h	h	h	h	h
Riders Per Revenue Hour	riders	riders	riders	riders	riders	riders	riders	riders	riders	riders
Abide with Service Standard	☐ Above Std ☐ Below Std	☐ Above Std ☐ Below Std	☐ Above Std ☐ Below Std	☐ Above Std ☐ Below Std	☐ Above Std ☐ Below Std	☐ Above Std ☐ Below Std	☐ Above Std ☐ Below Std	☐ Above Std ☐ Below Std	☐ Above Std ☐ Below Std	☐ Above Std ☐ Below Std

Amount of Service Calculation Worksheet

Population Coverage											
	Monday-Friday				**Saturday**			**Sunday**			**Total**
	AM Peak	Midday	PM Peak	Evening	Morning	Afternoon	Evening	Morning	Afternoon	Evening	
Calculating Annual Vehicle Hours											
Vehicles-hours Per Period	h	h	h	h	h	h	h	h	h	h	h
Number of Weeks Per Year											52
Annual Vehicle Hours											h
Calculating Vehicle Hours Per Capita											
Vehicle Hours Per Capita											hrs/cap
Abide with Service Standard											Above Std / Below Std