



Final Report

Transit Service And Downtown Terminal Needs Review



Prepared for City of Stratford
by IBI Group
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1 Background and Purpose

The City of Stratford provides conventional and specialized transit services. The conventional transit service consists of six fixed routes operating every 30 minutes Monday to Saturday while the specialized transit service, Stratford Parallel Transit, is a demand-response service operating seven days a week.

As a result of feedback received from the public by members of Council during the last municipal election as well as a desire to re-develop Market Square adjacent to City Hall where the main transit transfer point is located, the City retained IBI Group to review the conventional transit service issues and the downtown transit terminal location options. The purpose of this review and the following report is to provide information and analysis on each of the issues identified by members of City Council and the public and direction for consideration by City Council.

The key issues being addressed in this report specifically include:

1. Review the transit route network including a “continuous loop concept” and identify recommended route network changes and concepts suitable for application in Stratford. The route network alternatives should improve performance, serve newly developing areas within the city, and increase transit use;
2. Consider Sunday service including routes, service levels, cost, potential ridership and funding options;
3. Review site options for relocating the downtown transit terminal and provide terminal design concepts;
4. Review the suitability of equipping the transit bus fleet with bike racks; and
5. Consider the suitability of changing the conventional transit route schedule departure times to quarter to and quarter after the hour.

In the process of addressing the above issues, the consultant team met with City staff, several members of Council and the Environment and Transportation Task Force to confirm and review the issues. City staff also met with the transit bus operators to review the route network alternatives. A public information centre (PIC) was held on November 19th to provide information to the public and as an opportunity for the public to provide comment about the study and study conclusions with specific emphasis on route network changes, Sunday service and the downtown transit terminal location options.

The following sections summarize the results of the study.

2 Peer Review

As background to the study and to provide useful information about the performance of the city's conventional transit service, a peer review of transit services in other municipalities of similar size to Stratford was conducted. The peer municipalities are: Belleville, Brockville, Orangeville, Orillia, Owen Sound, St. Thomas and Woodstock. Although larger than Stratford, Brantford was included as it is located close to Stratford and is therefore a good comparator.

Exhibit 1 summarizes the key statistics for Stratford's peers together with those for Stratford based on data for 2013 (the most recent available) from the Ministry of Transportation. Stratford's statistics are for 2014. The Exhibit includes key background data such as population, vehicles, routes, ridership, revenue kilometres, expenses, revenue and net cost followed by "Performance Indicators".

The purpose of the peer review is to provide context for understanding how Stratford Transit is performing. Because of a wide range of variables between communities, it is not intended that the peer review be a comparison, per se, but rather, a context. The "Performance Indicators" provide a common basis for interpreting the performance of a transit system.

Comments about the performance of Stratford Transit are discussed below for each of the primary Performance Indicators.

2.1 Routes and Buses

Stratford has 6 routes serving the city which is similar or comparable to the peer group. The number of routes reflects the geographic layout of the city, the road network and also development patterns.

Stratford has 15 buses in the fleet which is higher than its peer group. However, 4 of the buses are utilized for brief periods in peak weekday hours for both school trips and service to the industrial area. Other cities may not provide these services.

2.2 Financial

ST achieved a 37% cost recovery (revenue divided by expenses) in 2014, compared to an average of 35% for the peer group. This rate is higher than Brockville, Orangeville, Owen Sound, St. Thomas and Woodstock but is lower than Belleville and Orillia.

ST's cost per revenue hour (expenditures divided by revenue hours) is \$80.84 which is the same as the average for the peer group. It is lower than Belleville, Brantford, Owen Sound and Woodstock. Local labour rates or the cost of materials can influence this cost as well as labour productivity.

Stratford's operating cost per passenger is lower than its peers which reflects the high ridership level in Stratford.

Stratford's 2014 municipal operating contribution per capita (expense minus revenues and provincial gas tax) was \$47.42.

2.3 Average Fare

ST's average fare at \$1.42 (revenue divided by ridership) is moderately lower than the peer average and significantly lower than some of the peers (Belleville, Brantford, Brockville) which reflects the fare levels. This reflects the difference in fare structure and higher fare levels amongst the peers. On a comparative year basis, the average fare for some of the peers may be higher than shown due to more recent fare increases.

Exhibit 1: Peer Review Summary

	Stratford	Belleville	Brantford	Brockville	Orangeville	Orillia	Owen Sound	St. Thomas	Woodstock	Average (w/o Stratford)	Average (w/ Stratford)
Service Characteristics											
Municipal Population	32,000	49,454	94,586	21,870	28,300	31,564	22,000	36,000	38,000	40,222	39,308
Service Area Population	32,000	37,000	94,586	21,870	28,300	31,564	22,000	36,000	38,000	38,665	37,924
Service Area Size (Sq.Km.)	27.0	247.2	75.1	20.3	14.0	28.8	23.7	35.7	39.0	60	56.8
Number of Fixed Routes	6	9	15	3	3	5	4	5	6	6	6
Routes per 1,000 capita	0.19	0.24	0.16	0.14	0.11	0.16	0.18	0.14	0.16	0.16	0.16
Routes per Active Veh.	0.40	0.60	0.48	0.75	0.75	0.63	0.80	0.45	0.67	0.64	0.62
Vehicles											
Active Vehicles:											
Light Rail Vehicles	-	-	-	-	-	-	-	-	-	-	-
Standard Buses	15	15	31	4	1	8	5	11	9	11	11
Articulated/Double Decker Buses	-	-	-	-	-	-	-	-	-	-	-
Small Community Buses	-	-	-	-	3	-	-	-	-	0	0
Total Active Vehicles	15	15	31	4	4	8	5	11	9	11	11
Percentage of Accessible Transit Fleet	100%	100%	100%	100%	100%	100%	100%	100%	78%	97%	98%
Ridership											
Ridership (Revenue Passengers)	615,745	917,459	1,571,812	102,764	112,100	750,000	266,640	213,300	306,297	530,047	539,569
Revenue Vehicle Kilometres	621,554	808,134	1,731,532	199,140	236,220	518,550	317,675	385,000	467,376	582,953	587,242
Revenue Vehicle Hours	29,836	40,536	76,149	10,496	9,999	25,379	13,926	17,017	18,430	26,492	26,863
Operating Revenue											
Regular Service Passenger Revenue	\$ 872,591	\$ 1,691,800	\$ 2,916,822	\$ 186,024	\$ 142,641	\$ 891,251	\$ 328,010	\$ 333,408	\$ 424,970	\$ 864,366	\$ 865,280
Total Operating Revenue	\$ 894,380	\$ 1,766,469	\$ 3,080,067	\$ 197,206	\$ 160,590	\$ 911,408	\$ 368,184	\$ 338,924	\$ 487,825	\$ 913,834	\$ 911,673
Total Revenue	\$ 894,380	\$ 1,766,469	\$ 3,177,650	\$ 197,206	\$ 160,590	\$ 911,408	\$ 368,184	\$ 351,105	\$ 487,825	\$ 927,555	\$ 923,869
Operating Expenses											
Transportation Operations	\$ 1,511,254	\$ 2,101,083	\$ 4,681,957	\$ 372,247	\$ 459,528	\$ 1,646,975	\$ 895,642	\$ 869,850	\$ 1,116,529	\$ 1,517,976	\$ 1,517,229
Fuel/Energy Exp. For Vehicles	\$ 391,000	\$ 581,674	\$ 1,129,447	\$ 84,636	\$ -	\$ -	\$ 170,217	\$ -	\$ 340,766	\$ 288,343	\$ 299,749
Vehicle Maintenance	\$ 420,062	\$ 569,810	\$ 1,479,220	\$ 60,745	\$ 127,250	\$ 1,140	\$ -	\$ 187,175	\$ 189,306	\$ 326,831	\$ 337,190
Plant Maintenance	\$ 24,424	\$ 128,096	\$ 1,446,917	\$ 65,373	\$ -	\$ 30,456	\$ 120,008	\$ 2,082	\$ 112,948	\$ 238,235	\$ 214,478
Genera/Administration	\$ 65,106	\$ 345,699	\$ 94,560	\$ 32,258	\$ 47,098	\$ 81,452	\$ 17,434	\$ 6,298	\$ 20,882	\$ 80,710	\$ 78,976
Total Direct Operating Expenses	\$ 2,411,846	\$ 3,726,362	\$ 8,832,101	\$ 615,259	\$ 633,876	\$ 1,760,023	\$ 1,203,301	\$ 1,065,405	\$ 1,780,431	\$ 2,452,095	\$ 2,447,623
Net Cost/Capita	\$ 47.42	\$ 52.97	\$ 59.78	\$ 19.12	\$ 16.72	\$ 26.89	\$ 37.96	\$ 19.84	\$ 34.02	\$ 33.41	\$ 34.97
Performance Indicators											
Financial											
Total Oper. Rev. / Total Dir. Oper. Exp (R/C Ratio)	37%	47%	35%	32%	25%	52%	31%	32%	27%	35%	35%
Municipal Operating Contribution / Capita	\$ 47.42	\$ 57.24	\$ 48.63	\$ 10.92	\$ 9.66	\$ 14.05	\$ 25.62	\$ 15.43	\$ 23.39	\$ 25.62	\$ 28.04
Net Dir. Oper. Cost / Reg. Serv. Pass.	\$ 2.46	\$ 2.14	\$ 3.60	\$ 4.07	\$ 4.22	\$ 1.13	\$ 3.13	\$ 3.35	\$ 4.22	\$ 3.23	\$ 3.15
Average Fare											
Reg. Serv. Pass. Rev. / Reg. Serv. Pass.	\$ 1.42	\$ 1.84	\$ 1.86	\$ 1.81	\$ 1.27	\$ 1.19	\$ 1.23	\$ 1.56	\$ 1.39	\$ 1.52	\$ 1.51
Cost Effectiveness											
Tot. Dir. Oper. Exp. / Reg. Serv. Pass.	\$ 3.92	\$ 4.06	\$ 5.62	\$ 5.99	\$ 5.65	\$ 2.35	\$ 4.51	\$ 4.99	\$ 5.81	\$ 4.87	\$ 4.77
Service Utilization											
Reg. Serv. Pass. / Capita	19.24	24.80	16.62	4.70	3.96	23.76	12.12	5.93	8.06	12.49	13.24
Reg. Serv. Pass. / Rev. Veh. Hr.	20.64	22.63	20.64	9.79	11.21	29.55	19.15	12.53	16.62	17.77	18.09
Amount of Service											
Rev. Veh. Hrs. / Capita	0.93	1.10	0.81	0.48	0.35	0.80	0.63	0.47	0.49	0.64	0.67
Average Speed											
Rev. Veh. Kms. / Rev. Veh. Hr.	20.83	19.94	22.74	18.97	23.62	20.43	22.81	22.62	25.36	22.06	21.93
Labour Productivity											
Rev. & Aux. Rev. Veh. Hrs. / Oper. Paid Hr.		0.69	0.70	0.63					0.98	0.75	0.75
Top Wage Rates											
Operators	\$ 26.94	\$ 23.92	\$ 24.47	\$ 25.95			\$ 16.50		\$ 28.54	\$ 23.88	\$ 24.39
Cost per Rev. Vehicle Hour											
Tot. Dir. Oper. Exp. / Rev. Hrs.	\$ 80.84	\$ 91.93	\$ 115.98	\$ 58.62	\$ 63.39	\$ 69.35	\$ 86.41	\$ 62.61	\$ 96.61	\$ 80.61	\$ 80.64

2.4 Cost Effectiveness

ST's cost per revenue service passenger (excluding transfers) is lower than all of its peers except for Orillia. Ridership levels have a significant influence on this indicator.

2.5 Service Utilization

Stratford's level of transit use (ridership and rides per capita) is significantly higher than the peer group average and higher than all of the peers except Belleville and Orillia. Both Belleville and Orillia benefit from having community colleges and universities within their service area which contribute to good ridership levels. Nevertheless, Stratford attracts a good level of transit ridership on the strength of high school students.

In terms of productivity (passengers per revenue hour), Stratford is higher than the peer average and higher than most of its peers except again for Belleville and Orillia, for the same reason as noted above. This indicates that ST is providing a level of service consistent with the ridership level.

2.6 Amount of Service

The amount of transit service or level of transit service provided, 0.93 revenue hours per capita (revenue hours divided by population served), is significantly higher than the peer average including Brantford and Orillia but lower than Belleville. Overall, Stratford is providing a good level of service both in terms of frequency and span of hours.

2.7 Summary of Peer Review

Overall, the City's transit system performs well, either comparable to or above the average of its peer group, in all performance categories. In particular, it performs well financially, has high ridership and good productivity.

However, changing development patterns in the city will be a challenge to maintaining this level of performance. The level of transit ridership, the cost to deliver the service and productivity (rides per capita and ridership per revenue-hour) generally reflects the compactness of the community, strength of a downtown core and location of various trip generators. With continuing expansion of the City in the northwest, to the west along O'Loane Avenue and northeast, this will expand Stratford Transit's service area, complicate travel patterns and therefore make it more difficult and less efficient to serve the City overall compared to today.

3 Review of Route Network and Improvement Options

In this section, options for improving the conventional transit route network is presented.

3.1 Route Network

Alternatives for realigning the existing Stratford Transit route network to address a number of service and customer-related issues associated with the existing route network are presented. These alternatives were developed as a result of a critical review of the route network by the consulting team and feedback received from stakeholders including members of Council.

The critical analysis of the route network identified the following deficiencies:

- A circuitous, indirect route network particularly for routes 2, 4 and 6 which involve large one-way configurations.
- Limited service to the important shopping area at Ontario Street and C.H.Meier
- Indirect service to the hospital and the commercial area at Erie and Lorne streets.
- A need to serve newly developing areas of the city along O'Loane south of Huron Street and McCarthy west of Greenwood Drive and the Rotary Recreation Centre.

The overall objective of the route network alternatives presented herein is to increase transit use by improving the attractiveness and **usefulness** of the transit system for more people.

3.1.1 Route Network Alternatives

Three route network alternatives have been developed, each designed to address the network design deficiencies, and are illustrated in Exhibits 2, 3 and 4. The key features of each alternative are as follows.

- Route Network Alternative #1:
 - Based largely on the existing route network.
 - Adds service to new developments along O'Loane and McCarthy.
 - Minor trade-offs in coverage within existing neighbourhoods, particularly in south Stratford, with areas receive added coverage, some areas lose coverage.
 - Direct two-way service from the commercial district at O'Loane and Huron, to the Festival Mall (Ontario and C.H. Meier streets), the hospital and the high schools.
 - Moderately increased route lengths compared to the existing routes which will increase vehicle utilization and ensure greater on-time performance.
- Route Network Alternative #2:
 - Retains the basic structure of the existing route network while simplifying routes to provide more direct and more reliable service.
 - Introduces concept of two-way loops for the north/east and south areas of the city.
 - Adds service to new developments along O'Loane and McCarthy west.

- More direct two-way service from the commercial district at O’Loane and Huron, Festival Mall, the hospital, high schools and the commercial district at Erie and Lorne.
- Moderately increased route lengths compared to the present routes which increases productivity.
- Routes 1 and 3 largely follow a one-way loop routing but provide two-way service between O’Loane/Huron, the high schools and downtown
- Routes 2 and 5 operate on a primarily overlapping one-way loops to provide two-way service along most their routes. This provides a direct link from the residential area along Devon and Romeo north as well as Mornington/Graff to the important shopping area at Ontario Street and C. H. Meier.
- With routes 2 and 5, the existing service along Ontario, Brunswick and Douro is rationalized to one way service each way on Ontario and Douro.
- Routes 4 and 6 similarly operate on primarily overlapping one-way loops to provide two-way service along most of the routes with links to the commercial area at Erie and Lorne and direct service to the hospital.
- Route Network Alternative #3:
 - Blends features of Alternatives 1 and 2, particularly the concept of two-way loops.
 - Adds service to new development areas long O’Loane and McCarthy west.
 - Direct two-way service from the commercial district at O’Loane and Huron, Festival Mall, the hospital, high schools and the commercial district at Erie and Lorne.
 - Regular all-day/weekday service to the industrial area south of Lorne Avenue.
 - An alternative evening and Saturday service with one route (#4) covering the south end and extended east of Downie to serve a portion of route 6.

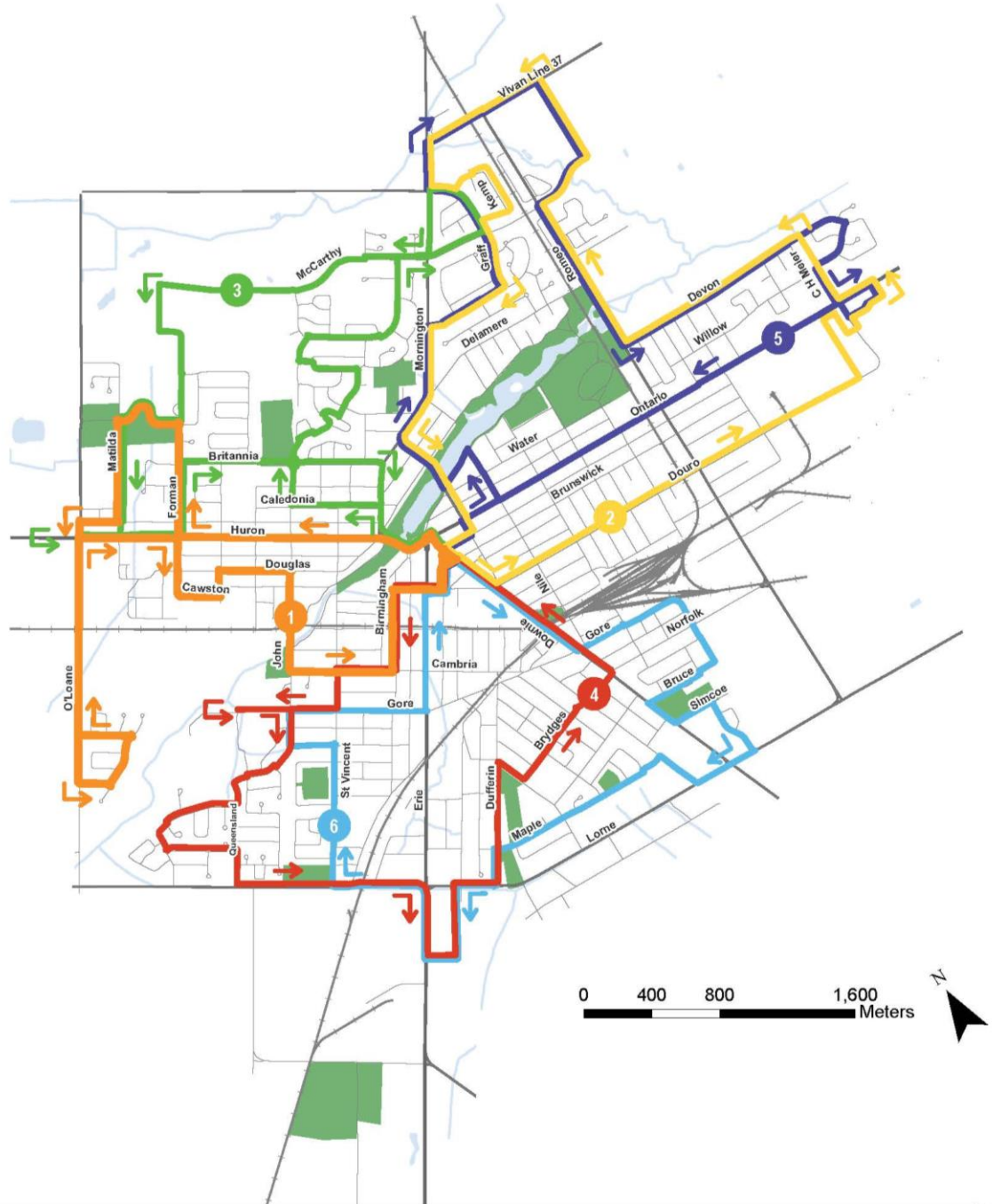
The evening and Saturday route network alternative, presented in Exhibit 5, would reduce the number of buses in service from 6 to 5 with resulting operating cost savings.

Exhibit 2: Route Network Alternative #1



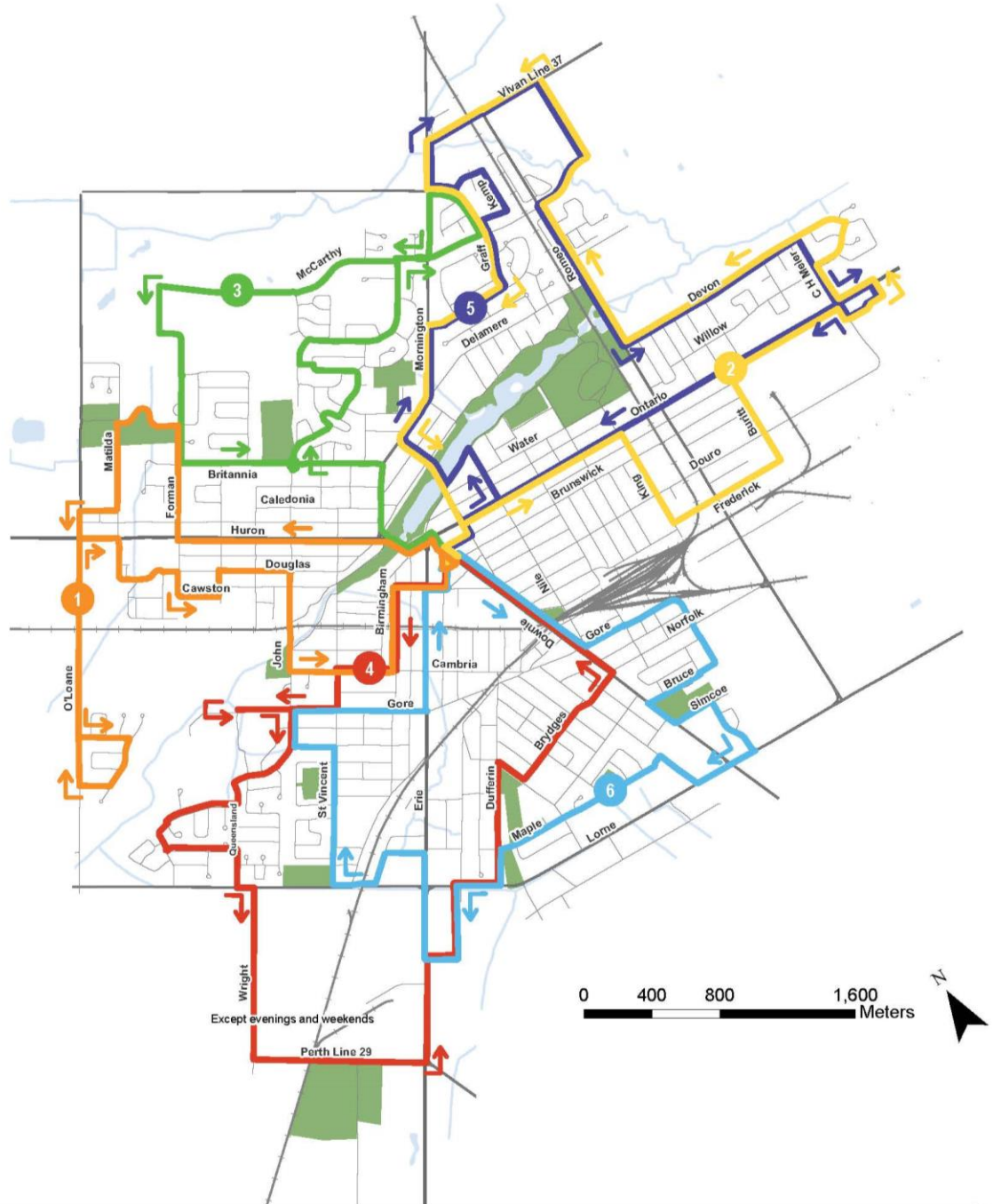
 Stratford Transit
Exhibit 1: Route Network Alternative #1 - Incremental

Exhibit 3: Route Network Alternative #2



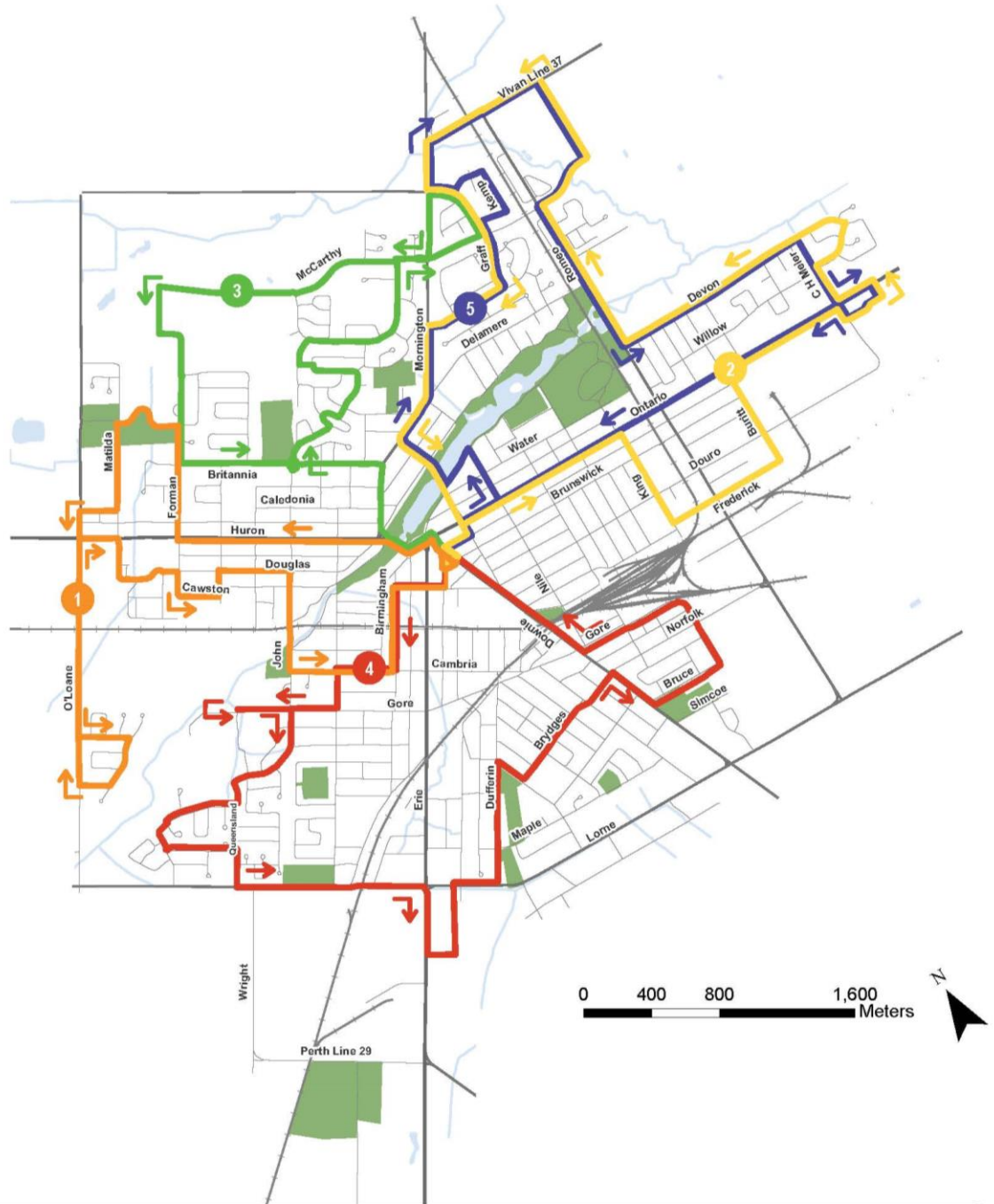
 Strafford Transit
Exhibit 2: Route Network Alternative #2 - Transitional


Exhibit 4: Route Network Alternative #3 – Weekdays



 **Stratford Transit**
Route Network Alternative #3 - Weekday Service

Exhibit 5: Route Network Alternative #3A – Evenings/Saturdays



 Stratford Transit
Route Network Alternative #3A - Evening and Weekend Service

3.1.2 Route Length Comparison

Exhibit 6 presents a comparative summary of the routes lengths for the network alternatives compared to the existing routes. All routes are within the general best practice planning guideline of an average speed of 22-23 km/hr. As can be seen, the overall length of routes 1 and 2 are increased. However, these existing routes are well below the route distance planning guideline and are known to have “extra” time within their current schedules.

Exhibit 6: Comparison of Route Lengths for Proposed Network Alternatives

	Route 1	Route 2	Route 3	Route 4	Route 5	Route 6
Existing	7.9	8.9	10.5	9.7	11.7	10.0
Alternative 1	11.3	11.6	11.5	11.9	11.9	11.6
Alternative 2	11.1	11.2	11.0	10.0	11.8	10.5
Alternative 3 Daytime	11.1	12.7	10.2	11.1	12.5	10.8
Alternative 3A Evening/ Weekend	11.1	12.7	10.2	11.5	12.5	10.8

3.1.3 Comparison of Walking Distance Coverage

As with any change in routes, changes in coverage, walking distances or access to a transit route will result. However, it should be noted that existing routes 4 and 6 provide extensive but duplicative coverage in the moderately small area of “south” Stratford. This characteristic results in excessively long travel times for most users and detracts from the attractiveness and usefulness of these routes. Accordingly, reduced coverage and some consequent increase in walking distance is warranted in these areas.

Each network alternative continues to provide excellent coverage, well within the 200 metre coverage/3-minute walking distance standard to a transit route that Transit staff use for service planning purposes although there would be some minor increase in walking distances for people living in the “south” Stratford area. The estimated maximum additional walk distance is about 100 metres or 2 minutes. A total of 10 bus stops are affected by the changes and the potential ridership involved is low.

3.1.4 Continuous Loop

The concept of a “continuous loop” system to replace the existing route network has been proposed for consideration although no specific details have been provided. Discussions suggest that the concept is based on buses circulating throughout the city, either following each other or travelling in opposite directions along a large “continuous” loop with no layover, or pause, at a downtown terminal or transfer point to permit transit users to transfer between routes if they require more than one route to complete their trip. Instead, buses would pass through the downtown, stopping at designated stops but not waiting to connect with buses originating from other areas of the city.

While the concept appears efficient and would eliminate the need for a common downtown transfer point, or terminal, for the transit routes, the concept would not be as attractive or convenient to existing or potential transit users as the existing route network structure with a central transfer point. For example, the concept does not reflect the varied travel patterns of residents where people across the city travel from various origins to various destinations, not just downtown. Currently, over 25% of transit users use more than one route to reach their destination. As such the continuous loop concept does not provide the travel flexibility offered by the existing system and would mean that if a transit rider wished to reach a specific area of the city, they would need to wait until the desired route bus arrived or remain on the bus until it reached their destination and this could take up to an hour or more. Depending on the arrival or

departure time of individual routes and buses passing through the downtown, transit users may not connect with their desired bus if the route they need to use happens to pass through ahead of the bus they are on and, instead, have to wait up to 30 minutes to board their bus, or stay on the bus until it reached their destination. This concept results in a significant inconvenience to the user by increasing their travel time and makes the transit system less attractive and less useful. It may also be confusing to existing and potential transit users.

It is therefore a significant disincentive to encouraging people to use transit where the objective should be to provide more direct service and reduce travel times. It is also significantly disadvantageous in comparison to auto drivers who can drive directly to anywhere they want to go in the city without detour, subject to the road network. If the same disincentive was imposed on car users, then the continuous loop concept might appear more attractive. In view of the inconvenient characteristics of the "continuous" loop concept, it is not recommended for consideration in Stratford.

3.1.5 Service Level Alternatives

Although not a criteria used in developing the network alternatives, route network alternative #3A offers the advantage of reducing service during the weekday evenings and on Saturdays by removing one bus from the route 4/6 combination while still maintaining adequate coverage. As indicated in Alternative #3A, Exhibit 5, a small portion of the area served by route 6 along Gore Road east of Downie Street would be added to route 4 in the evening and on Saturdays to maintain coverage in this area of the city.

Reduction of service by 1 bus during the evenings and on Saturdays would save approximately 1,664 revenue-hours annually.

3.1.6 Service to the Festival Mall

One continuing operational or routing issue still to be addressed is service to and through the Festival Mall.

The current situation has buses travelling through the mall along the main access roadway. Unfortunately, this routing conflicts with delivery vehicles, people stopping to drop off or pick up shoppers as well as speed bumps, all of which impede the movement of buses through the property resulting in delays and loss of operating efficiency as well as presenting potential safety issues. On this basis, transit service should be removed from the mall unless the Mall management agreed to changes to their internal road network to provide a more convenient and unimpeded routing for transit buses.

Transit staff and the consultant are reviewing alternatives to permit continued convenient service to the mall for implementation at a future date.

3.1.7 Preferred Alternative

Of the three proposed network alternatives, the preferred alternative is #3/3A for several reasons:

1. Superior links from several areas of the city to important and useful destinations, namely shopping/commercial areas at O'Loane/Huron, Ontario and C.H. Meier, Erie and Lorne, the hospital and high schools;
2. Service to new areas (O'Loane and McCarthy west);
3. Rationalized service in south Stratford;
4. Ability to moderately reduce service costs in the evenings and on Saturdays; and
5. Service to the industrial area south of Lorne Street during weekdays.

The final route network and routings adopted will need to be finalized by transit staff together with details regarding bus stop locations, relocation of bus stops and shelters and development of new customer information materials (route map/schedule brochure) and promotional information.

4 Sunday Service

Stratford currently provides conventional transit service from 6:00 a.m. to 10:00 p.m. Monday to Friday and 6:00 a.m. to 8:00 p.m. on Saturdays. There is no conventional transit service on Sundays. Stratford's specialized transit service, Stratford Parallel Transit, operates during the same hours but does operate on Sundays from 9:00 a.m. to 4:00 p.m. There is no service on Statutory Holidays.

Although Sundays are becoming more active with many businesses now open similar to Saturdays, Sundays still continue to be a lower activity day in comparison to Saturdays. While transportation to church services is often cited as one reason for providing service on Sundays, it is much less important today. Church services and hours have changed over the years and many churches now have fewer services with many commencing at 10:00 a.m. Church attendance has dropped significantly such that any potential ridership is much reduced thereby making it more difficult to justify commencing transit service earlier just for that purpose. As a result, in communities where Sunday service is provided, the service hours are shorter, from approximately 10:00 a.m. to 6:00 p.m. In future, as society changes and work and shopping habits change, earlier and later hours for transit may be warranted.

This section presents options for providing transit service on Sundays together with costs, potential ridership and fare revenue estimates, and funding options.

4.1 Transit Service Options

There are generally two alternative approaches to providing conventional transit service on Sundays in a city the size of Stratford:

1. Fixed route – operate the existing conventional transit routes; or
2. Demand-response. Service would be provided on a demand-response basis similar to the Parallel Transit service. There would be no fixed routes. The city would be divided into “zones” with one bus operating in each zone and connecting at the downtown transfer terminal point.

4.1.1 Fixed Route

For the fixed route option, there are three sub-options which can be considered:

- a. Operate the existing Monday to Saturday routes every 30 minutes. This would require 6 buses and bus operators.
- b. Operate all routes but with a reduced service of 60 minutes on some of the routes. For example, 4 of the routes would operate every 60 minutes with the remaining two highest ridership routes (1 and 2) continuing to operate every 30 minutes. This would require 4 buses and 4 bus operators.
- c. Operate all routes at a reduced service level of 60 minutes. This would require 3 buses and 3 bus operators.
- d. Operate only some of the routes such as those with demonstrated higher ridership. However, this option would be inequitable, leaving parts of the city without service, would likely result in resident complaints and is therefore not proposed for consideration.

4.1.2 Demand Response

The Demand Response option is a proven strategy and is used in a number of small and medium size municipalities such as Peterborough, Welland, Cornwall, Sarnia and Whitby.

However, it can be difficult to understand from a customer perspective and challenging from an operations perspective especially for limited applications such as Sunday service.

Under this option the objective would be to serve the city with a minimum number of vehicles and thus minimize operating costs. For example, the city would be divided into two “zones” with one bus operating in each zone which would be fewer than for Fixed Route option C above. Buses would operate from the downtown terminal, to permit transfers between the zones and buses, and service scheduled to operate into their zone every 30 minutes. Riders would either call in to be picked, board the bus at the terminal or transfer from another zone bus.

This approach requires a dispatcher or the bus operators themselves to respond to service requests by accessing recorded messages in advance of each trip departure using cell phones and then plan how they will travel around their zone to pick up or drop off passengers.

4.2 Estimated Operating Costs

Exhibit 7 summarizes the service options described above, revenue-hour estimates, vehicle requirements and annual operating cost estimates for each of the service options. The annual operating cost is based on Stratford’s 2014 cost per hour of \$80.84. The operating costs would range from \$214,711 for the 30 minute-all routes option to \$71,463 for the demand-response option.

Exhibit 7: Summary of Sunday Operating Costs

OPTION	BUSES/ DRIVERS REQUIRED	REVENUE HOURS PER DAY*	NUMBER OF OPERATING DAYS*	ANNUAL REVENUE HOURS	ANNUAL OPERATING COST
Fixed Route: 30 minutes	6	51	52	2,656	\$214,711
30/60 minutes	4	34	52	1,768	\$142,925
60 minutes	3	25.5	52	1,326	\$107,194
Demand Response	2	17	52	884	\$71,463

*Based on 8.5 hours per bus per day

**Service on Statutory Holidays would be additional.

**Costs for communications equipment would be extra.

4.3 Ridership and Fare Revenue Potential

In general, Sunday transit use (ridership) potential is lower than Saturdays for an equivalent level of service, notwithstanding the trend towards an increased level of activity on Sundays. Ridership is also directly related to the level of service provided (frequency of service, hours of service) – less service, less ridership potential.

Weekday transit ridership is approximately 2,500 to 2,700 per day. Ridership levels on Saturdays are approximately 50% that of weekdays, in the range of 1,200 to 1,300 rides per day, largely the result of a lower level of student ridership on Saturdays. For Sundays, the potential may be less than half that of Saturdays due to the lower Sunday activity levels.

For the four fixed route and demand-response service options outlined above, the following daily ridership estimates are projected based on the reduced levels of service and experience in other communities. For this analysis, service would be provided between 10:00 a.m. and 6:00 p.m.:

Fixed Route:

- Option A (6 routes, 30 minute service, 6 buses) – 600 rides (11.8 trips/bus/hour)

- Option B (6 routes, 30/60 minute service, 4 buses) – 300 rides (8.8 trips/bus/hour)
- Option C (6 routes, 60 minute service, 3 buses) – 200 rides (7.8 trips/bus/hour)

Demand Response:

- 2 buses – 100 rides.

Proportionately lower ridership estimates for the Fixed Route Options B and C compared to Option A are forecast due to the lower frequency (60 minutes) on the routes and associated travel inconvenience. For example, with routes operating every 60 minutes, compared to 30 minutes, transit users would have to wait longer between buses for a return trip and users who must use two routes to reach their destination, may have to wait an additional 30 minutes at the terminal for their connecting route. This situation would greatly lengthen their travel time and reduce the attractiveness of the service.

For the Demand-Response option, a significantly lower ridership level is indicated largely on the basis that a demand response service, while appearing to be more personal, could, in fact, be less convenient overall since users would have to call ahead to book a pick-up and may have a less direct trip depending on the number of people being picked up or dropped off during each service cycle.

Exhibit 8 presents the ridership and associated fare revenue estimates for the service options. Fare revenues are based on Stratford’s 2014 average fare level of approximately \$1.42 per ride.

Exhibit 8: Ridership and Revenue Estimates

SERVICE OPTION	OPERATING DAYS	RIDERSHIP PER DAY	ESTIMATED ANNUAL RIDERSHIP	ESTIMATED ANNUAL REVENUE*	ESTIMATED OPERATING COST	ESTIMATED NET COST
Fixed Route: 30 minutes	52	600	31,200	\$44,304	\$214,711	\$170,407
30/60 minutes	52	300	15,600	\$22,152	\$142,925	\$120,773
60 minutes	52	200	10,400	\$14,768	\$107,194	\$92,426
Demand Response	52	100	5,200	\$7,384	\$71,463	\$64,079

*Assumes all riders are cash or ticket

This analysis indicates that Sunday ridership could range between 5,200 and 31,200 annually depending on the service option. Annual fare revenues would vary accordingly between \$7,384 and \$44,304. The net municipal investment would range between \$64,079 for the demand response service and \$170,407 for the 30 minute fixed route service option.

4.4 Effect of Monthly Passes

However, the foregoing revenue estimates are based on the existing Monday to Saturday fare payment conditions which are a blend of cash/ticket paying users and monthly pass holders. Since over 50% of transit riders use monthly passes, and unless the monthly pass rate was increased to reflect the additional days of service each month, no additional revenue would accrue from transit riders who use passes. Pass holders would then effectively ride “free” on Sundays. On the basis that the price of the monthly passes would not be increased, the foregoing revenue estimates would need to be reduced by some amount, potentially up to 50%, since no additional fare revenue would occur. The resulting net cost for the Sunday service options could then be higher than the amounts indicated in Exhibit 8.

4.5 Operations and Staffing Considerations

To introduce Sunday service, the following operational issues will need to be considered:

1. Sunday is currently not a recognized "day of work" within the collective agreement covering transit employees. The agreement would need to be revised to permit service to be provided on Sundays (and potentially Statutory Holidays).
2. Changes to bus operator work schedules would be required.
3. Bus operator lunch break relief. An additional bus operator will need to be available to provide a 30-minute lunch break for the bus operators on duty as currently occurs Monday to Saturday.
4. Supervision – arrangements will need to be made for someone to supervise the operation and be available to respond to operational issues.
5. Vehicle maintenance and cleaning, farebox emptying. Arrangements will need to be made to provide support in the event of a mechanical issue with a bus and for staff to fuel, clean and wash the buses and empty the fareboxes at the end of the day.
6. Additional vehicle hours would increase maintenance costs and may require additional maintenance staff.
7. Parallel Transit hours of service. Under the AODA, the hours of service for a specialized transit service need to be, at a minimum, the same as for those of the conventional transit service. If the conventional service operates until 6:00 p.m., then the Parallel service hours would need to be extended from the current 4:00 p.m. to 6:00 p.m. This could be offset by changing the morning start time to coincide with the conventional service start time of 10am.
8. Introducing service on Sundays would likely result in requests for service on Statutory Holidays. Of the primary statutory holidays (New Years, Family Day, Good Friday, Victoria Day, July 1st, Civic Holiday, Labour Day, Thanksgiving Day, Christmas Day, Boxing Day), it is suggested that service would not be offered on 5 of them (New Years, Good Friday, July 1st, Christmas Day and Boxing Day).

Addressing the above operational issues may increase the overall Sunday operating cost. City staff will need to develop a service plan related to implementing Sunday service and confirm any additional costs.

4.6 Options for Funding Sunday Service

As Council is interested in introducing Sunday service but concerned with minimizing the cost impact, there are several approaches to funding the extra service within the existing budget envelope as an alternative to increasing the annual operating budget:

1. Utilize gas tax funding;
2. Reduce existing transit service levels;
3. Increase transit fares; or
4. A combination of the above.

With regard to the second option, four sub-options are possible:

- A. Reduce weekday daytime service on selected routes.
- B. Reduce Saturday service levels on selected routes.

- C. Eliminate Saturday early morning service and reduce service levels on selected routes.
- D. Adopt recommended route network Alternative #3A with reduced service levels (1 less bus in service) weekday evenings and on Saturdays.

4.6.1 Gas Tax Funding

The City could direct a portion of the annual gas tax funding towards the Sunday service. Currently, the City primarily utilizes gas tax for capital purchases. The City receives approximately \$186,000 in gas tax funds annually.

4.6.2 Reduce Existing Service Levels

A review of current levels of transit use based on discussions with transit staff, indicate that the service is well used on most routes during all hours of the weekday although routes 5 and 6 could be candidates for a lower level of service during weekday midday and evenings. As well, early morning Saturday service has limited ridership and routes 5 and 6 could have service levels reduced during the remaining hours of service. To fund the Sunday service from an expenditure standpoint, a total of between 2,652 revenue-hours (6 buses, 30 minute service) and 884 revenue-hours (Demand Response) annually would need to be transferred from the existing services. Any loss of ridership and fare revenue would marginally increase the required cost savings and service-hours. The following combinations are potential sources for these additional hours:

- Reduce routes 5 and 6 during weekday midday and evenings from 30 minutes to 60 minutes. Total savings – 9 revenue-hours per day; 2,365 per year. Since weekday daytime;
- Eliminate early Saturday morning service. Service hours could be changed to commence service at 7:30 a.m. instead of 6:00 a.m. This would save 9 revenue-hours per day or 468 revenue-hours annually.
- Reduce Saturday service levels to 30/60 minutes (4 buses, 4 drivers) between 7:30 a.m. and 7:30 p.m. This would save 24 revenue-hours per day or 1,248 revenue-hours annually.

Another option, as outlined in section 2 and 4.6 above, would be to adopt the preferred route network alternative #3A which reduces the number of buses in service weekday evenings and Saturdays to five by combining re-structured routes 4 and 6. This would result in an annual revenue-hour savings of 1,664 generally sufficient to fund the 30/60 minute Sunday service option of 4 buses requiring 1,768 revenue-hours annually. Under this option and with the proposed route network alternative 3A, routes 1, 2 and 5 would operate every 30 minutes, requiring 3 buses, and routes 3 and 4 every 60 minutes with one bus.

4.6.3 Increase Transit Fares

An increase of between 10% and 20% to the transit fares would be required to cover the added net cost of the Sunday service for the service options outlined. A fare increase of this level could negatively impact transit use overall with the result that fare revenues would not achieve expected levels.

4.7 Summary

Four service delivery options and service levels can be considered for providing transit service on Sundays. The annual operating costs would range from \$71,463 to \$214,711. The estimated annual ridership would range from 5,200 to 31,200. Fare revenues would range from \$7,384 to \$44,304 although actual revenues may be less subject to monthly pass pricing. The

estimated annual net cost would range from \$64,079 to \$170,407. A Sunday transit service can be expected to attract between 5,200 to 31,200 new trips annually. On a ridership per revenue-hour basis, this represents a rate of 5.9 to 11.7. Current transit ridership rates average 20.6.

4.8 Preferred Option

Based on the review and assessment of Sunday service options, should Council wish to introduce Sunday service, the preferred service option would be to adopt route network Option #3A with a reduced requirement for 5 buses for weekday evening and Saturday services compared to 6 buses at present and using 4 buses on Sundays with a blend of 30 and 60 minute services.

5 Downtown Terminal Location

Alternative locations for the transit terminal in the downtown area have been considered on several occasions in response to the desire to re-development the area now used by the transit buses and the municipal parking lot as a market and landscaped area. This section reviews the locations previously considered and the associated terminal design concepts developed for those locations along with two new location options – St. George Street and St. Patrick Street, and design concepts. The primary criteria for considering alternate terminal locations was that they would be within the downtown area in order to maintain good access to businesses, employment and retail services.

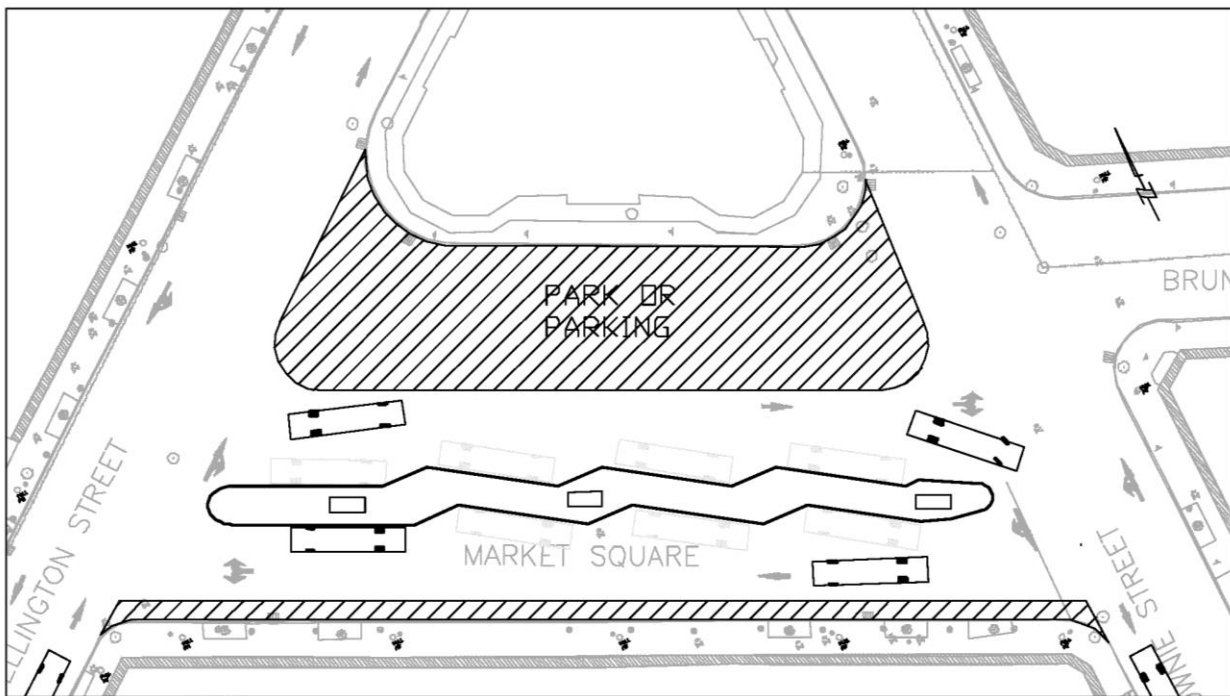
5.1 Previously Considered Sites

Locations considered for the transit terminal in previous reviews were Market Square, the use of Wellington and Downie Streets on either side of City Hall, the parking lot on Erie Street, and the parking lot off Cooper Street.

Market Square

Attached exhibit 9 illustrates a concept for a transit terminal on the market square parking lot which was not favoured in view of the desire to redevelop the parking lot for other purposes.

Exhibit 9: Concept Design for Market Square Transit Terminal

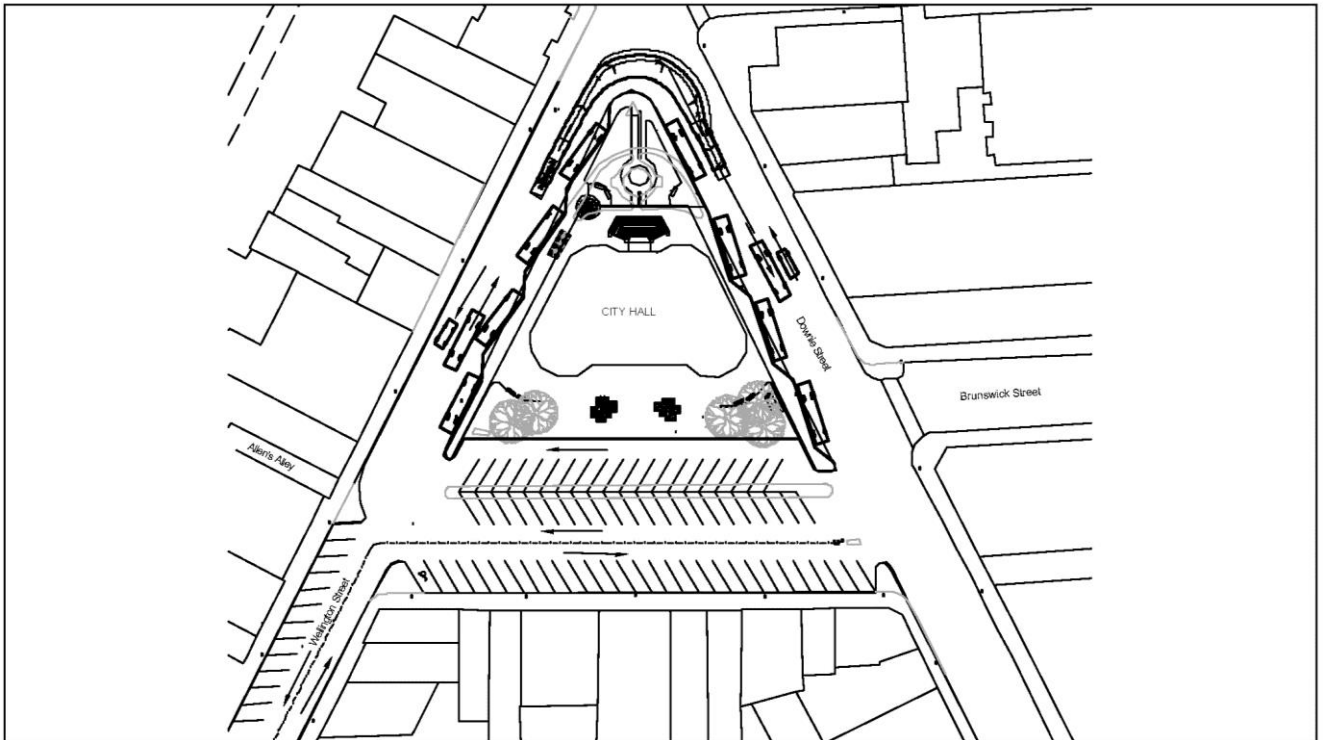


Wellington and Downie Streets beside City Hall

Exhibit 10 illustrates the potential layout of arranging buses either side of City Hall on Wellington Street (northbound) and Downie Street (southbound). This concept was not explored further in view of both the operational implications (extended walk distance and time for transit users transferring between routes) and visual impact on City Hall.

It was suggested during the course of this study that buses could be similarly arranged but further south on each street parallel to Market Square. This arrangement could negatively affect access to a future market square re-development as well as having negative operational implications on transit operations as noted above for the original concept design. As a result, this would not be a preferred alternative.

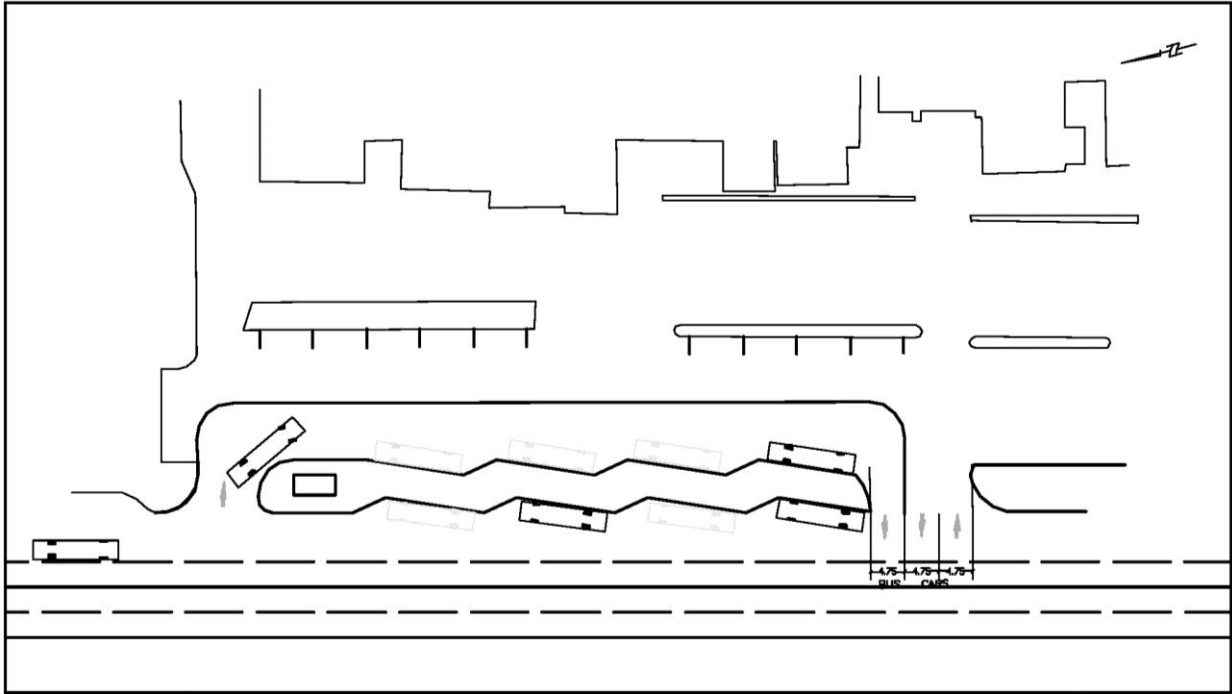
Exhibit 10: Use of Wellington/Downie Streets for Transit Terminal



Erie Street

Use of the parking lot for transit purposes along with a parking structure above, was considered as illustrated in Exhibit 11. However, the site size would not be large enough for both a transit terminal and a parking structure while access to and from Erie Street would be problematic. In addition, the cost to construct a terminal and parking structure would be significant. For these reasons, this site was not considered further.

Exhibit 11: Concept Design for Erie Street Transit Terminal



Cooper Street

This site was considered prior to it being partially re-developed for the Stratford Campus of the University of Waterloo. The remaining portion of the site is not sufficient for a transit terminal as well as having a constrained access from St. Patrick Street. It also lacks visibility for potential transit users.

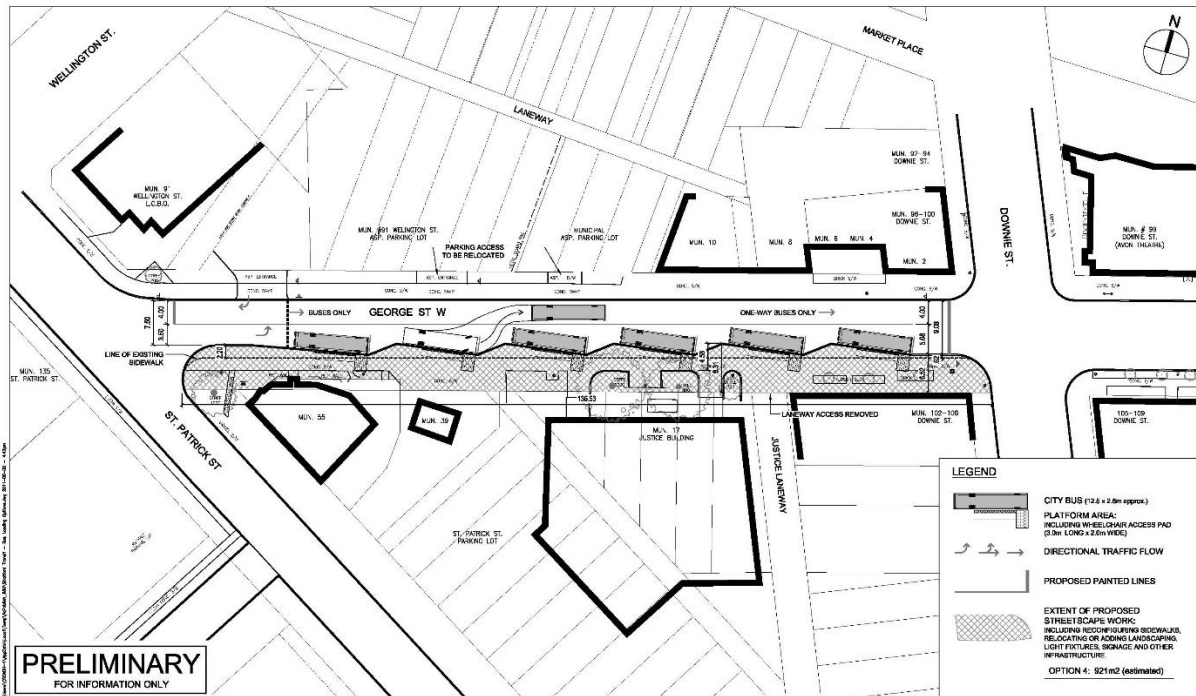
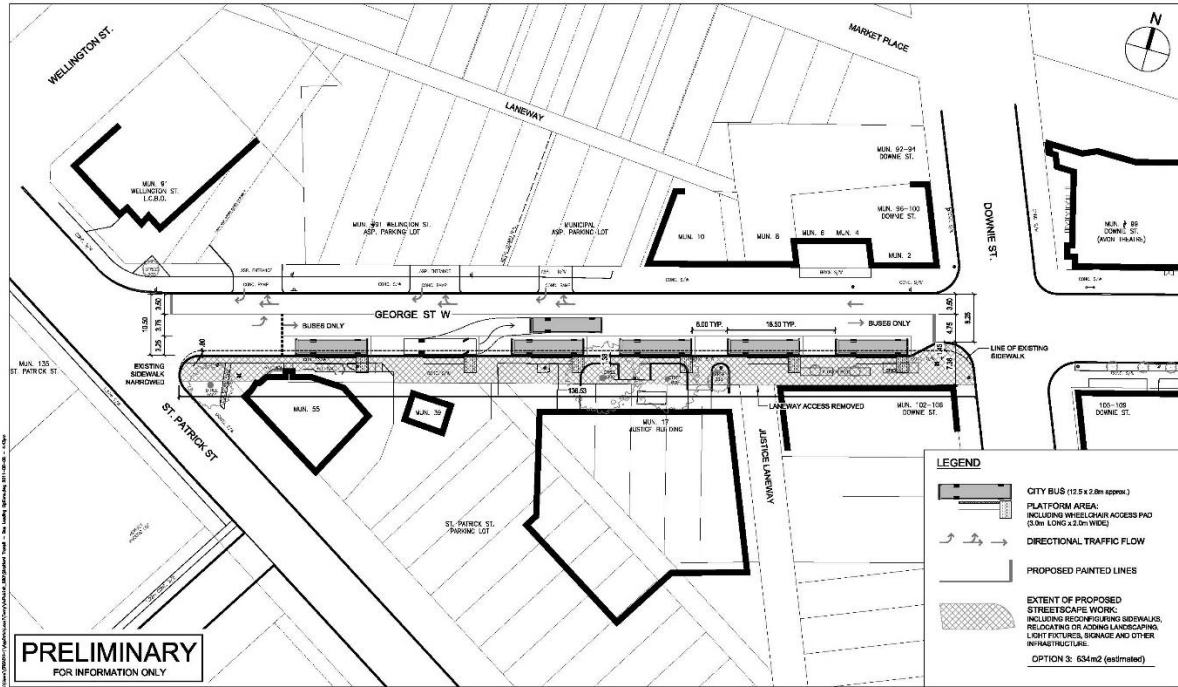
5.2 New Potential Terminal Locations

Two new sites for relocating the transit transfer point in the downtown were identified – George Street, and the parking lot on St. Patrick Street in combination with the use of a portion of St. Patrick Street.

George Street

In an effort to identify potential transit terminal locations, the option of closing or using part of a downtown city street was considered. This option was based on examples from other cities, such as Woodstock, where a street allowance was closed and used as the location for a transit terminal. A key criteria in considering a potential street was that it would be a relatively minor street with limited existing traffic volume and would not adversely affect access to commercial properties. Accordingly, George Street was identified as a potential candidate and two alternative terminal design concepts were prepared as illustrated in Exhibit 12. The first concept would see the eastbound lanes of the street dedicated to buses with buses parking parallel to the curb. The second concept would close the street east of the entry to the LCBO and individual angled bays for each route constructed. This design would allow buses to enter and exit independently but would require the full width of the street.

Exhibit 12: Concept Designs for Transit Terminal on George Street



St. Patrick Street

St. Patrick Street and the adjacent municipal parking lot were identified as another potential location option within the downtown area. In this concept, a portion of the parking lot as well as the current parking lane on-street would be utilized for a terminal. The design concept illustrated in Exhibit 13 features a centre-island platform with 3 buses positioned along either side. Buses would enter and exit in either direction (east, west). The platform would conceptually include

amenities for transit users (benches, shelters) and information signage as well as additional lighting. Provision could be made in the design for a washroom (non-public) for the transit employees. Subject to final design, it is estimated that 25 parking spaces within the parking lot and 13 on-street would be required for the terminal.

Exhibit 13: Concept Design for Transit Terminal on St. Patrick Street



6 Other Operations Considerations

During the course of the transit study, two operational issues were proposed for consideration: the use of bike racks on buses; and a change to the route departure times from downtown.

6.1 Bike Racks

In support of and to complement the principle of active transportation, the question of adding bike racks to the bus fleet was raised. Bike racks, attached to the front of buses, are an increasingly common feature in medium and large cities as a way for cyclists to travel a longer distance by utilizing the transit system. The racks cost approximately \$2,500 each and accommodate two bikes. They also extend the length of the bus by approximately 18 inches.

The demand for and usefulness of adding bike racks to buses in smaller cities and towns, however, is questionable as the benefit to cyclists, in terms of time savings, is limited. For example, the time taken for a cyclist to travel to the nearest bus stop, wait for the bus, board, travel to their destination, get off, unload the bicycle and complete their journey could well be more than if the person bicycled all the way. Overall, there is little or no information available about the potential demand to use buses by bicyclists. From a transit operations perspective, the time taken by a cyclist to load then unload their bicycle could delay the bus. In a small transit system with short routes, even several minutes can cause the bus to run behind schedule. As well, the added length to the bus of a bike rack would present operational and logistical challenges within the bus garage which is already constrained.

Instead, smaller towns and cities, have opted to permit bicycles to be taken on board the bus, under certain conditions (low ridership periods and subject to driver discretion). In this way, use of transit by bicyclists is encouraged and, over time, the actual need or benefit of adding bike racks to buses can be assessed. This practical approach is suggested for Stratford and, based on demonstrated need, a decision in time can be made as to whether or not to install bike racks.

6.2 Route Schedule Times

The routes schedules currently have buses arriving and departing downtown on the hour and half hour (00/30). A suggestion was made that consideration be given to changing this to quarter after and quarter to the hour (15/45) on the basis that this would allow people working and attending appointments in the downtown area additional time to walk to and from the bus stop. While this suggestion has merit for trips destined to or from the downtown area, in contrast, it would disadvantage people destined to or from locations in the rest of the city such as the malls at the outer ends of Ontario and Huron Streets, at Lorne and Erie Streets, the Rotary complex or the industrial area south of Lorne Street.

In prior reviews of the transit system, the current arrival/departure times downtown had not been identified as a disincentive to using transit. Therefore, on balance and in consideration that a schedule time change could disadvantage certain trips compared to other trips with no clear indication of a benefit and increased ridership potential associated with a schedule change, no change to route schedule is proposed.

7 Public Information Centre

A public meeting was held on November 19th at the Rotary Complex to present the results of the transit service review and the relocation options for the downtown transit transfer point to the public and to receive input.

The meeting was well attended by approximately 75 people including a member of council, transit staff and representatives of the local media (Stratford Gazette and Beacon Herald). For the meeting, the study purpose, findings and key conclusions were presented on a series of 13 display boards. The consultant made a verbal presentation of the study findings using the display boards as referenced, fielded questions and facilitated a general discussion regarding the study results and key conclusions. An electronic version of the display boards was also posted on the City's website.

Attendees were provided with comment forms on which to record their opinions and preferences for the study conclusions. A total of some 36 responses including emails were received.

In general, the primary feedback received at the meeting and on the comment forms were:

- Strong support for introducing transit service on Sundays, with a suggestion to start earlier than 10am (as proposed);
- Desire that the transit terminal remain where it is but a preference for the St. Patrick Street location should the terminal have to be relocated; and
- General support for route network Alternative #3.

Few comments were received about either adding bike racks to the buses or to changing the route schedule downtown. It would appear that participants supported the explanations provided on the display boards and by the consultant.

8 Recommendations

Based on the study findings, conclusions and results of the public input, the following recommendations are presented for consideration by City Council, that:

1. The study report be received;
2. Route network alternative 3 and 3A be adopted with implementation to occur by fall 2016 subject to the necessary operations arrangements and plans for bus stop and shelters installations and relocations, and preparation of customer information materials and new service promotion campaign;
3. Approve the introduction of Sunday service on the basis of route network alternative 3 and 3A with 30/60 minute service between approximately 10am and 6pm to be funded through the cost savings from the adoption of route network 3/3A as outlined within this report; and
4. The combination of the parking lot and on-street site on St. Patrick be the preferred location for the transit terminal when relocated from the current location.