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YORK REGION TRANSIT SMALL BUS STRATEGY PILOT PROJECT

The Transit Committee recommends:

- 1. The presentation by Irene McNeil, Manager, Service Planning be received; and**
- 2. The recommendation contained in the following report, April 26, 2005, from the Commissioner of Transportation and Works be adopted:**

1. RECOMMENDATION

It is recommended that:

1. Regional Council endorse the one-year Newmarket Community Bus pilot as outlined in this report, scheduled to begin in June 2005, with staff reporting back to Transit Committee in six months.

2. PURPOSE

This report explores the development of a Small Bus Strategy with the intention of integrating smaller buses (less than 30 feet) where applicable, into the overall York Region Transit (YRT) system. These buses could potentially replace some conventional 30, 35 or 40-foot buses in fixed-route conventional service, be used in Community Bus service, or in more flexible conventional operations, such as demand-responsive, or zone bus services. Specialized transit services (YRT Mobility Plus) currently employ small accessible buses and are excluded from this review.

3. BACKGROUND

The majority of the information gathered for this report is from the Transit Cooperative Research Program's (TCRP) study titled, "The Use of Small buses in Transit Service," published in 2002. The TCRP was founded by the U.S. Federal Transportation Administration (FTA) in 1992, after a report by the American Public Transportation Association (APTA) identified the need for transportation problem-solving research. The TCRP undertakes research and other technical activities in response to the needs of transit service providers. With regard to the above-mentioned study, 94 Canadian and American transit agencies provided information to TCRP on their experiences with the use of buses of various sizes.

In addition to the TCRP data, information was collected directly from Canadian transit agencies who use small buses in their current operations. These contacts include Oakville Transit, Translink (Vancouver), Grand River Transit (Kitchener-Waterloo), Transit Windsor, and Ajax-Pickering Transit.

In 2001, the five local municipal conventional transit systems amalgamated to create YRT. YRT routes currently consist of core routes (operating along major arterial corridors), feeder or local routes (operating in local neighbourhoods), high school specials (which focus on specific student demand), Express routes, GO train shuttles, and one Community Bus route (operating in Richmond Hill). Each category of route serves a particular transit market and each plays an important role in the success of the overall integrated network.

Additionally, YRT contracts small yellow school buses for transit service during late evening periods on two local routes in the Markham and Vaughan areas. These routes are, however, operated during the day by conventional transit buses when passenger volumes warrant the use of larger capacity buses. The contractor is compensated for this service based on an hourly rate for each service hour operated. The current hourly rate is approximately half the cost of operating the larger conventional transit buses, however, it must be noted that these buses do not have air conditioning, fareboxes or electronic destination signs, have narrow aisles, limited headroom, have louder interior noise, and are equipped with smaller child size seats.

The 2001 amalgamation brought with it a diversity of services and a variety of vehicle sizes and makes. For example, the previous Newmarket Transit system consisted of two 26-foot buses, six 30-foot buses, one 35-foot bus, and six 40-foot buses. The current conventional fleet mix includes 40-foot, 35-foot, and 30-foot buses from a variety of manufacturers. Further discussion regarding YRT's fleet mix is contained in Section 4 – Analysis and Options.

This review of current fleet mix and service delivery options is the result of a variety of issues including:

- Need to review the provision of service to lower-demand suburban areas.
- Overall system cost effectiveness.
- Growing concern over noise and emissions.
- Perceptions of underutilization.

3.1 Growing Suburbanization

Suburban land-use patterns, involving low-density subdivision design with circuitous street patterns, and strip commercial development along arterials, are notoriously difficult for traditional transit to serve cost-effectively. Population densities and demand for transit service vary considerably throughout York Region; for example, the south is more urbanized with higher transit use, as compared to a more suburban and even rural north

where it is difficult to provide transit service in a cost-efficient manner. On a full network basis, YRT recovers approximately 50% of operating costs through farebox revenues. However, some local/feeder routes recover much less than this (20-30%), while the main core routes (e.g. Hwy 7 and Yonge St.) experience almost full cost recovery.

3.2 Cost Effectiveness Based on Vehicle Type

It is clear from the research conducted by TCRP that on an annual basis, the cost per hour of small bus services is marginally lower than service using larger buses. This cost differential is primarily as a result of reduced fuel consumption and lower labour costs (especially where a special small bus wage rate has been negotiated). For the purposes of this review, a 10-year life-cycle cost analysis has been completed with data derived from Canadian and American transit experience. The details of these analyses are included in Section 5 – Financial Implications.

3.3 Noise and Emissions

Although 40-foot buses offer excellent capacity (38 seated/22 standees), they are nonetheless heavy-duty vehicles that sometimes generate complaints of noise from residents in local neighbourhoods. This is especially the case in areas where streets are narrow and houses are located in close proximity to the street curb. Smaller buses have lower noise levels than larger buses and are generally perceived as more environmentally friendly. This is demonstrated by the fact that small buses have lower fuel consumption (due to smaller engine size) on a per passenger basis.

3.4 Perceived Image

Beyond specific complaints related to the physical characteristics of large buses, all transit agencies receive complaints about the perceived cost and inefficiency of operating standard size 40-foot buses in areas of lower demand. This is often expressed as “the empty bus syndrome.” YRT has received concerns over the years from both riders and non-riders regarding perceived “empty buses” traveling through their neighbourhoods. There are valid reasons for the use of 40-foot buses, and low utilization may in fact occur as a result of low ridership at particular points on a route. However, there are also other reasons to deploy larger vehicles such as: fleet interlining with other more productive routes, mid-route peak loads, etc. Nonetheless, the perception is a valid concern and merits attention.

4. ANALYSIS AND OPTIONS

As previously noted, YRT routes consist of core routes, feeder or local routes, high school specials, GO train shuttles, express services, late evening contracted yellow school buses, and one Community Bus route. The purpose of this analysis is to identify an ongoing role for small buses, including the formal designation of candidate routes and identification of areas for potential implementation.

Table 1 includes the current YRT fleet mix and the contracts or divisions in which the vehicles operate. In order to move forward with a Small Bus Strategy, YRT would need to negotiate with current service providers to implement a vehicle transition plan in order to transfer buses between divisions. Current YRT service contracts and operating rates are based on specific vehicle allocation and may limit the ease with which vehicles can be moved/transferred between divisions.

The following table illustrates YRT's current fleet mix. Approximately two-thirds of the fleet is accessible and air-conditioned.

Table 1
YRT Current Fleet Mix

Division	26-foot Bus	30-foot Bus	35-foot Bus	40-foot Bus	TOTAL
1 - Markham & Stouffville	0	12	3	48	63
2 - Northern York Region	2	8	13	9	32
3 - Richmond Hill	3	12	15	43	73
4 - Vaughan	0	11	0	61	72
TOTALS	5	43	31	161	240

The current contracts state that the Region reserves the right to transfer vehicles between contractors as required, and endeavours to provide a minimum of 30 days notice to the respective contractors. Prior to the transfer, the Region and respective contractors need to agree to a transfer strategy.

The routes in *Table 2* were chosen as candidate routes for smaller buses due to one or a combination of the following criteria:

- Suburban/Rural setting
- Circuitous routing
- Limited/low demand
- Low financial and performance productivity

Table 2
Preliminary List of Candidate Routes for Small Bus Operations
(Shorter than 30 feet)

Division	Route Number	Route Name	Number Peak Buses Required
1	9	Stouffville	2
1	9A	Stouffville Local	1
1	203	Centennial GO Shuttle	1
2	31	Aurora North	2
2	44/66	Upper Canada Mall - Glenway	2
2	50	Queensway South (Keswick)	1
2	51	Keswick Local	1
2	52	Holland Landing Local	2
2	56	Gorham Eagle	2
2	58	Leslie North	2
2	223	Newmarket GO Shuttle	1
3	84	Oak Ridges	2
3	89	Richmond Hill Community Bus	2
4	11	Woodbridge	2
TOTAL			23

4.1 Potential Uses for Small Buses

There are many reasons for integrating small buses into a transit fleet mix, however, according to the TCRP report, approximately 93% of transit agencies using small buses cited limited demand as the main reason for their use. Alternative applications for small buses include other more targeted uses and are described below.

4.1.1 Low Demand Routes

The routes listed in *Table 2* experience low demand, which could be due to the suburban or rural nature of the area through which they operate. Both Canadian and American transit experience show improved customer service when using small buses on these types of routes. However, the productivity improvement that can be achieved on such routes remains limited; on average, routes operating in low demand areas using small buses only carry between four and thirteen passengers per hour due to the combined limitations of low demand, limited vehicle capacity, and cost-effectiveness considerations.

4.1.2 Community Bus

Community Bus routes are fully accessible transit services for general public use, but typically the routing is somewhat customized for seniors and people with disabilities who can use accessible conventional transit. Rather than follow conventional routing patterns, these routes are designed to provide better access to facilities oriented to this market group, such as senior's residences, medical facilities, community centres/libraries, and

shopping areas. This type of route is also ideally suited to small bus application since the vehicle is required to access less than standard roads or driveways. Generally, Community Bus routes operate in areas of lower demand with maximum frequencies in the 30-60 minute range.

4.1.3 Demand Responsive

The term Demand Responsive refers to the provision of transportation services on a per-person demand basis. The service is usually provided with an advance call process, whereby customers request a pick-up at a specific time, and identify the origin and destination of the trip. Demand Responsive services are currently operated by YRT for specialized services for registered persons with disabilities (Mobility Plus). In Canada, this type of service provision is normally used for specialized transit services only, where door-to-door driver assistance is required.

Demand Responsive services have, however, also been used in the transit industry for geographic areas where conventional fixed services are not warranted or cost-effective, but where there is nonetheless a desire to provide some form of publicly subsidized transit service. In fact, the former Markham Transit operated a Demand Responsive service using taxi cabs called Transcab for several years, in an area where demand did not justify fixed conventional transit routes. Various flexible forms of demand responsive service can be found in different Canadian cities. Some of these involve replacing daytime fixed route service with a Demand Responsive bus in the evenings, whereby the bus meets a major arterial bus route or GO train, and then delivers customers to their homes or bus stop according to a pattern determined at the time by the operator. This can allow for more cost-effective coverage of a geographic area when demand is low.

Another good example of Demand Responsive services is the Zone Bus operated by Oakville Transit. In this operation, riders are required to call Oakville Transit to request a pick-up from the nearest bus stop or major intersection and provide a destination point, within the zone. All calls must be placed at least two hours before the requested pick-up time. A small 12-seater, non-accessible van is used for this purpose. Additional dispatch costs must be factored into the equation when considering this type of service.

4.1.4 Business Area Shuttles

For a premium fare, the YRT Business Express service accommodates high demand travel between the Finch Subway station and business employment areas in the Hwy 404/Hwy 7 area (Markham and Richmond Hill). This service is currently operating with 40-foot vehicles which are basically at capacity. The main issue with this service is that once employees get to Hwy 7, limited transit service is offered to penetrate the business parks. These areas would be ideally suited for a small bus shuttle to connect from the main corridor (Hwy 7) into the business parks.

4.4 Longer Term Strategy

A systematic and well thought-out approach is required to develop a successful Region-wide plan for the deployment of smaller buses. In order to continue to grow ridership, it

is important to provide a high level of service coverage and frequency, while simultaneously managing financial resources. YRT staff are currently in the process of developing a new Five-Year Service Plan (2006-2010). A small bus strategy will be taken into consideration as part of the overall network plan for the next five years. The following issues will be considered to ensure a consistent and comprehensive approach is taken.

4.4.1 Develop Standards and Policies

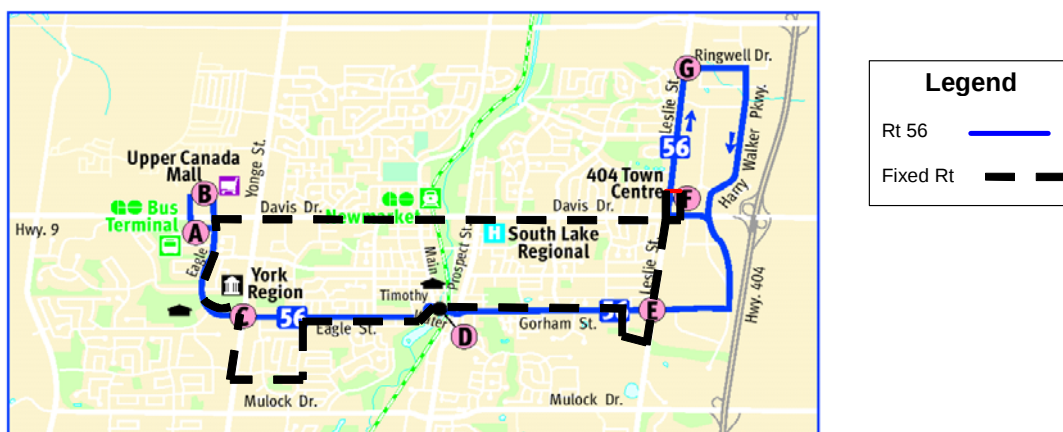
The first step is to develop standards/policies for future small bus application as part of YRT's new Five-Year Conventional Transit Service Plan. Such standards could include minimum density requirements, pedestrian amenities, trip generation projections, minimum productivity guidelines, probationary time limits to meet minimum standards, and technical specifications for the vehicles.

4.4.2 Demonstration/Pilot Project

In order to more clearly assess the financial implications of small bus use, it is proposed that a one-year pilot project be implemented in June of this year. Staff will report back to Committee in six months with specific attention paid to operating costs per year between buses, and environmental issues such as fuel costs and emissions. The pilot project is proposed for the Newmarket area and is outlined below.

Currently, YRT operates both a fixed conventional transit route (Route 56 Newmarket) and a semi-fixed specialized transit route in an area of Newmarket. Careful review of passenger counts (on/off) indicates that by combining these two services and creating a Community Bus route, a higher level of service could be provided at the same or reduced costs. Further, registered riders with Mobility Plus would no longer need to call and book a trip (as with the current operation), and the provision of two vehicles would provide service in both directions on the fixed-route. It is believed this new route would be an ideal candidate for a small bus pilot.

Exhibit 1
Route 56 and the Newmarket Fixed Route



It is proposed that the Newmarket Community Bus pilot will combine the routing of both conventional Route 56 and the Mobility Plus Newmarket fixed route. Since many medical and seniors' facilities are located along this route, the use of a low-floor wheelchair accessible bus is recommended for this particular area. A 26 foot low-floor ELF vehicle (existing fleet) will be used to replace the larger conventional bus currently used on Route 56, resulting in two small low-floor vehicles operating the new Community Bus pilot route.

4.4.3 Renegotiation or Issuance of New Service Contracts

As YRT's four operating contracts expire or are eligible for renewal between January and June 2006, consideration would be given revisiting the contracts in an attempt to obtain a preferred rate for the operation of smaller (less than 30- feet) buses.

4.4.4 Develop Vehicle Transfer Plan

As part of the overall fleet plan development, a strategy will be created to address vehicle transfers between divisions to cover possible candidate small bus routes.

4.4.5 Develop Longer Term Strategy

As part of YRT's new Five-Year Service Plan (2006-2010), it is intended that a longer term (two-five year) strategy be developed to identify other small bus applications (e.g. business park shuttles, zone buses, new routes in low demand areas). Each of these applications should be designed to serve the needs of specific geographic and/or ridership market segments. The longer term small bus strategy should identify a coherent set of applications (i.e. service products). This variety of services would complement existing fixed route and bus rapid transit services served by larger buses, in order to create an integrated *family of services*.

4.5 Branding of Small Buses

An effective communication and marketing campaign will contribute to the successful implementation of a small bus service. Along with marketing efforts, it will be important that the service be supported by a customer information system that will ensure that all potential riders are fully aware of service operation, including its specific attributes and advantages. YRT staff recommends a special effort be taken to promote and brand the new services and its features as a unique but integrated service type.

4.6 Relationship to Vision 2026

The launching of a small bus strategy is supportive of the Region's goal relating to "Infrastructure for a Growing Region", and the action area of "making transit accessible ... continuing to improve service and infrastructure for successfully integrated transit service". Part of this strategy includes optimal access for all residents to public transit. It is believed the inclusion of a small bus strategy will assist the Region in achieving a balanced transportation system.

5. FINANCIAL IMPLICATIONS

Over an 18 year period, the potential cost savings between using accessible conventional 35 or 40-foot buses and buses smaller than 30-foot, range from 4% for a low-floor 30-foot bus to 34% for a high-floor lift-equipped 25-foot bus, annually.

Not factored into the costs of small buses is the potential lower wage rate for operators. Both in Canadian and American transit systems, successful negotiations over time have resulted in a lower wage rate for operators of small buses. Wage rate differences can vary from 55% to 80%, between small and large buses. This wage rate discount significantly reduces the cost of operating small buses, measurably increases their cost-effectiveness, and compensates for the lower levels of demand. Such negotiations, however, require a long-term strategy.

5.1 Life Cycle Analysis

The following table illustrates the approximate costs and savings of utilizing 40 or 30-foot buses versus 25-foot low-floor ramp-equipped, and 25-foot high-floor lift-equipped buses. It should also be noted that both the 40-foot and 30-foot buses have a life span of 18 years, while the smaller 25-foot buses have a life span of five to seven years. YRT's capital budget numbers have been used as a base, and all vehicle capital costs include fareboxes and taxes.

Table 3
Comparison of Capital Costs (000s) over 18 years

	40-foot bus Low Floor w/ Ramp	30-foot bus Low Floor w/ Ramp	25-foot bus Low Floor w/ Ramp	25-foot bus High Floor w/ Lift
Capital Cost year 1 ¹	\$ 540	\$ 495	\$ 235	\$ 110
Capital Cost year 8 ²	\$ 0	\$ 0	\$ 235	\$ 110
Capital Cost year 9 ³	\$ 100	\$ 100	\$ 0	\$ 0
Capital Cost year 15 ⁴	\$ 0	\$ 0	\$ 235	\$ 110
TOTAL COST over 18 years	\$ 640	\$ 595	\$ 705	\$ 330
Average Capital Cost Per Year	\$ 36	\$ 33	\$ 39	\$ 24

Source: YRT and U.S. experience

Notes:

1. Initial capital outlay for vehicle purchases.
2. Additional purchase of smaller buses (due to shorter vehicle life of 7 years).
3. Refurbishment of larger vehicles at year 9.
4. Additional purchase of smaller vehicles at year 8 and year 15.

Table 4
Comparison of Operational Costs (000's) over 18 Years

	40-foot bus Low Floor w/ Ramp	30-foot bus Low Floor w/ Ramp	25-foot bus Low Floor w/ Ramp	25-foot bus High Floor w/ Lift
Annual Fuel Cost/Year	\$32	\$30	\$14	\$14
Maintenance Cost/Year	\$15	\$15	\$ 9	\$ 9
Bus Operator Cost/Year ¹	\$40	\$40	\$40	\$40
Total Cost for 1 year of operations	\$87	\$85	\$63	\$63
Total Cost over 18 years (versus 40 foot bus)	\$1,566	\$1,530	\$1,134	\$1,134

Source: YRT and U.S. experience

Notes:

1. Assumes no difference in operator rate for smaller buses.

Table 5
Total Average Annual Costs (000's)

	40-foot bus Low Floor w/ Ramp	30-foot bus Low Floor w/ Ramp	25-foot bus Low Floor w/ Ramp	25-foot bus High Floor w/ Lift
Avg. Annual Operating Cost	\$87	\$85	\$63	\$63
Avg. Annual Capital Cost	\$36	\$33	\$39	\$18
Avg. Annual Operating & Capital Costs	\$123	\$118	\$102	\$81
Avg. Annual Total Savings	N/A	4%	17%	34%

Source: YRT and U.S. experience

Table 6
Other Performance Measures

Measure	40-foot bus	30-foot bus	25-foot bus
Annual Kilometres	85,800	85,800	74,400
Cost/Kilometre	\$0.90	\$0.87	\$0.59
Kilometre/Litre	1.7	1.8	3.4

Source: YRT and U.S. experience

6. LOCAL MUNICIPAL IMPACT

A Small Bus Strategy would have application across the Region. Small buses could be used for a variety of services depending on market demand and operating requirements. Each municipality across the Region has different needs, and an overall longer term strategy to address these individual needs will provide for a customized and cost-effective service solution.

7. CONCLUSION

While cost savings are evident, there are also credible qualitative reasons to include a small bus strategy as part of the future of YRT's fleet plans. Small buses can provide savings in fuel consumption, be a flexible and cost-effective alternative in serving low demand areas, and improve the perception of public transit efficiency. In the short term, a pilot project in the Newmarket area will help to assess the actual cost savings, environmental benefits, and customer satisfaction. YRT staff will report back to Transit Committee in six months with results from the pilot. The development of a longer term small bus strategy will be included in the new YRT 5-Year Service Plan underway this spring.

The Senior Management Group has reviewed this report.