

# Reducing Regina's Transportation Footprint

Increasing the Relevance of Regina Transit

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Better Urban Systems

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## ABSTRACT

A scoping level study of how to reduce urban pollution by reducing reliance on personal vehicles and growing ridership on Regina's public transit system.

## Table of Contents

<b>1.0 INTRODUCTION</b>	<b>3</b>
<b>2.0 ENVIRONMENTAL IMPACTS</b>	<b>3</b>
<b>3.0 RIDERSHIP GROWTH STRATEGIES</b>	<b>4</b>
3.1 UNIVERSITY PASS	5
3.2 EMPLOYER PASS PROGRAMS	6
3.3 SERVICE ENHANCEMENT	6
3.4 REGINA TRANSIT PROMOTIONS	7
<b>4.0 SYSTEM IMPROVEMENTS</b>	<b>8</b>
4.1 CAPITAL IMPROVEMENTS	8
4.1.1 <i>New Buses</i>	8
4.1.2 <i>Current Regina Bus Fleet Background</i>	9
4.1.3 <i>Emission Reduction</i>	9
4.1.4 <i>New Fleet Costs and Savings</i>	11
4.1.5 <i>Rider Quality Improvement</i>	12
4.2 INFRASTRUCTURE UPGRADES	13
<b>5.0 ALTERNATIVES</b>	<b>13</b>
<b>6.0 CONCLUSION</b>	<b>14</b>

## **1.0 Introduction**

Environmental sustainability is a key issue among many communities today.

Regina, like many Canadian cities, has made a promise to decrease greenhouse gas emissions by 2012 and will need to make some major changes in order to meet that goal. One of the major contributing factors to poor sustainability is emissions from motor vehicles. This is also a factor that we may have the most influence on.

In order to reduce emissions, Better Urban Systems (BUS) consulting is recommending improvement on the current transit system. Specifically, we will detail a campaign to increase rider numbers (and thus decreasing personal automobile usage) as well as an upgrade of the current transit infrastructure, including the route and buses.

## **2.0 Environmental Impacts**

Reducing the environmental footprint is a priority for urban planners in Canadian cities. Improved public transit is an important step towards this goal. For Regina, replacing the current fleet of vehicles with new, more efficient ones will significantly decrease certain types of emissions. Improved public transit will also reduce the number of vehicles on city roads. With reduced number of vehicles on the roads,

traffic congestion, noise pollution, and exhaust emissions will be reduced. Also, with the use of public transit there will be less demand for parking space downtown. This space will have the potential to be turned into Green Space or for other city improvements.

### **3.0 Ridership Growth Strategies**

The strength of any urban transit system is a strong, loyal ridership base who make the transit system a part of their daily lives. By taking people out of their personal vehicles and onto transit on a regular basis the city of Regina will make substantial strides in reducing the environmental impact of in-town transportation.

Three residents of Regina surveyed for this scoping study expressed strong “auto-centric” sentiments which is a barrier to Regina Transit’s mission. In order to overcome this attitude Regina Transit must focus efforts on new programs that make public transit an attractive alternative to driving. Better Urban Systems has identified a number of initiatives that will, if implemented correctly, undoubtedly increase transit ridership in Regina.

### 3.1 University Pass

With two strong post secondary institutions within city limits Regina Transit could benefit from the introduction of University Passes. The University Pass is a full access transit pass issued to and paid for by all students of an institution regardless of actual transit usage. The University Pass was first introduced to Canada at Queen's in the 1970's while in modern years the University of Victoria introduced their U Pass in 1999. Currently hundreds of institutions across North America have implemented University Passes with dramatic results and increases in transit usage<sup>1</sup>.

Most University Passes are revenue neutral programs thus giving students incredible discounts on the transit service. These programs are made revenue neutral by assessing pre-Pass ridership levels and assigning a revenue value to each institution, this revenue value is then divided by the total number of students attending the school, returning a per student University Pass fee that is levied upon students and paid with their tuition.

University passes enable students to avoid the costly venture of owning and operating personal vehicles<sup>2</sup> and provide a safe way for them to get from place to

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<sup>1</sup> In Vancouver the U-Pass program increased ridership at UBC by 53% in its' first year, and at SFU a 39% increase was experienced in the same time period.(U-Pass Review Final Report)

<sup>2</sup> 71% of UBC students say that the U-Pass has allowed them to reduce their reliance on using a car and/or avoid buying one.(U-Pass Review Final Report)

place when inebriated or tired. The increase in ridership associated with University Passes necessitates increased service which not only serves the students with passes but also community members along bus routes.

### **3.2 Employer Pass Programs**

An Employer Pass Program can be aimed at all businesses and would offer discounts on transit passes to companies who have enough employees register in the program. Although it may be more difficult to get working professionals out of their cars and onto public transit it can be an attractive option to many individuals, especially if they have families and are in a position of needing two vehicles or during times where gas prices are prohibitive.

### **3.3 Service Enhancement**

Changes will be made to improve the coverage of the Regina transit system. Improvements to the quality of transit in Regina will increase ridership levels. Below are measures that will improve coverage.

- Extend the number two route further north to include the new development north of Argyle Park. The industrial area along Pasqua Street will be included in the transit network.
- Readjust route ten through Woodland Grove. Woodland Grove will maintain its bus service with a less convoluted route.
- An additional bus route is necessary to provide access to the airport as well as the new development to the south of the airport.

After establishing the transit network changes, a text message schedule service will be implemented. The service will allow riders the ability to access a list of buses that are scheduled to arrive at their stop. While waiting, the rider will send a text message to the transit service number. The text message will indicate the stop number as listed on the sign at the stop. Within seconds of sending the message, the rider will receive a response by the automated schedule service. The message will inform the rider of the expected time of the busses arrival.

### **3.4 Regina Transit Promotions**

In many cases people avoid public transit due to the social stigma associated with public transportation, this can be due to a perceived lack of cleanliness or

unreliability of the system or any number of other factors. It is incredibly important for Regina Transit to assess why people avoid the system, take corrective actions and then inform the public of the steps being taken to suit their needs. By addressing people's concerns and presenting them something that challenges the ideas they hold much progress can be made towards the end goal of reducing private automobile usage.

## **4.0 System Improvements**

### **4.1 Capital Improvements**

#### **4.1.1 New Buses**

The increased number of riders expected from the growth plan as detailed in Section 3.0 calls for an increased number of buses. In addition, the current bus fleet includes many older buses that are high in emissions and maintenance costs and that decrease rider quality. Thus, the purchase of new buses is key to both the direct reduction of emissions from the buses as well the support of the rider growth plan outlined above. With the decrease in maintenance costs and increased usage, the purchase is also financially feasible.

For these reasons, BUS is recommending the purchase of 20 new Nova buses for the Regina bus fleet and the retirement of the oldest 10 buses.

#### 4.1.2 Current Regina Bus Fleet Background

The current Regina bus fleet has 103 buses with 72 buses required for peak service. Among these buses there are 18 that date back to 1977-1981 and 52 from 1984-1992. For the older buses to stay in service, a costly refurbishing program has been instated.

#### 4.1.3 Emission Reduction

New buses, with new technology, have a much lower emission rate than the older models, as seen in Figures 1 through 3.

Figure 1. Comparison of particulate matter emission from buses of different ages.

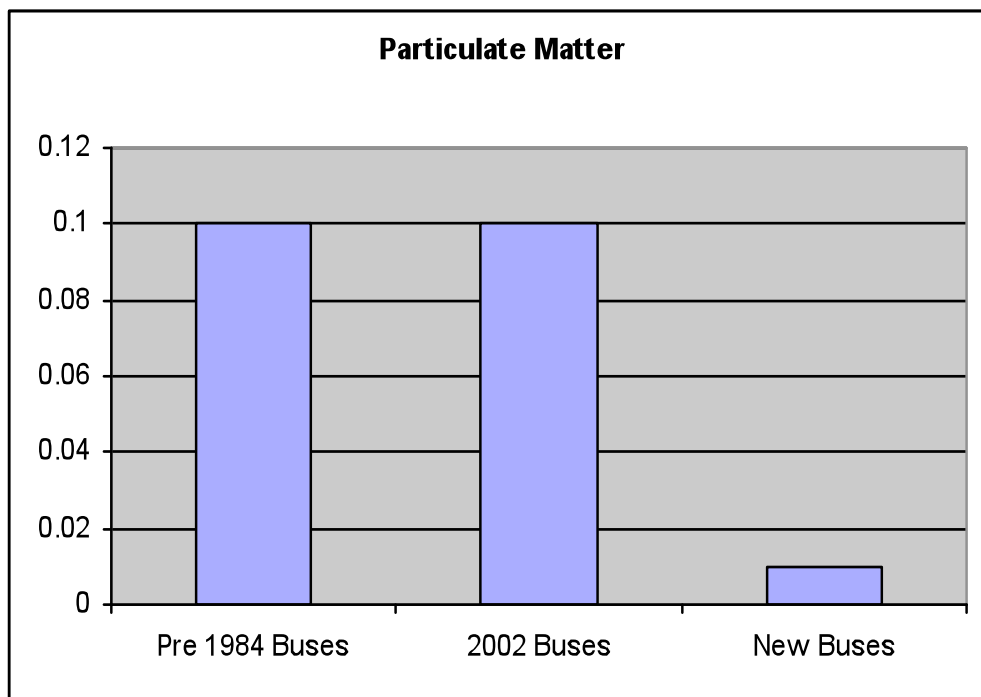


Figure 2. Comparison of NO emissions from buses of different ages.

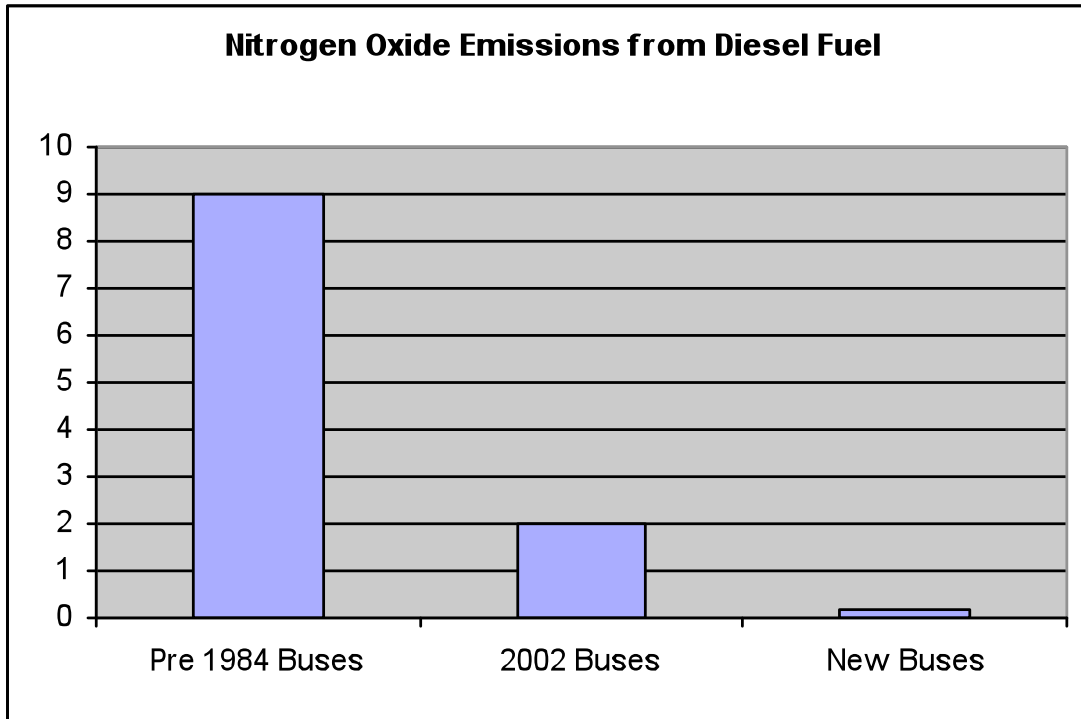
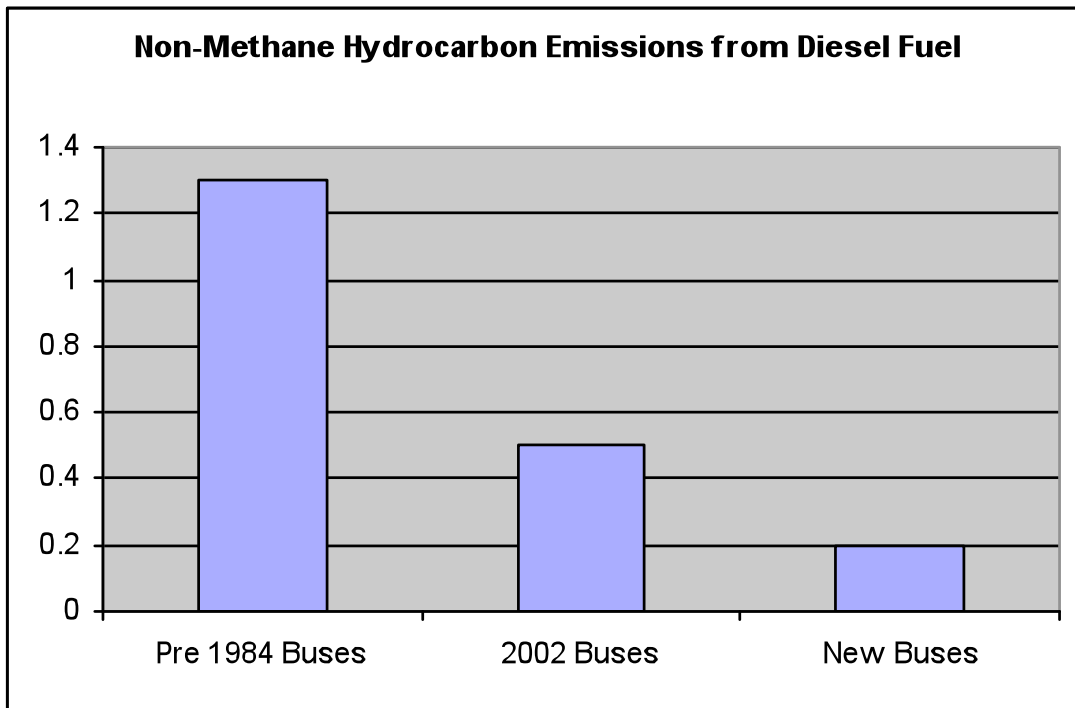


Figure 3. Comparison of Non-Methane Hydrocarbon emissions from buses of different ages.



As seen, a new model will have a 4500% decrease in Nitrogen Oxide emissions, 900% decrease in Non-Methane Hydrocarbons and a 1000% decrease in Particular Matter from the 1984 bus model. The Regina Bus fleet still has 18 of these buses, and with the purchase of new buses, we plan on retiring at least 10 of the older model as they clearly are not meeting emission standards.

#### 4.1.4 New Fleet Costs and Savings

Costs are one of the main concerns when purchasing a large number of new buses. The detail of costs and savings are seen below in Table 1 and 2.

**Table 1. Price comparison between purchasing new buses versus refurbishment.**

<b>Cost of a Refurbishing per Year</b>		<b>New Bus Costs Per Year</b>	
Cost	\$270,700	Cost	\$412,500
Number of Buses	8	Life Expectancy	18
Cost Per Bus	\$33,837.50	Cost Per Year of Life	\$22,916.67
Life Expectancy	10		
Cost Per Year of Life	\$3,383.75		

## **Table 2. Maintenance Cost Estimates**

### **Maintenance Costs Annually**

Maintenance Costs	\$2,261,600
Cost Per Bus	\$23,806.32
Cost Per New Bus <sup>3</sup>	\$5,951.58
Number of New Buses	20
Maintenance Cost with New Buses	\$1,904,505.26
Cost Difference (Amount Saved)	\$357,094.74

As seen, although new buses are expensive, there are savings in decreased maintenance costs. The initial investment of the 20 buses will eventually be offset by both the decrease in maintenance costs as well as the life expectancy. After the first 10 years of running in service, the life of an older bus would be over, thus needing either increased refurbishment or the purchase of new buses. Also, studies have shown that for the cost of refurbishing one older bus, two newer buses (12 years or so in age) can be refurbished to be like new and thus further decrease maintenance costs.

### **4.1.5 Rider Quality Improvement**

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<sup>3</sup> New Buses need half the maintenance for double the travel distance.

New buses will also improve rider quality and thus foster growth in the transit community. Newer buses have better ergonomics and aesthetics for uses to enjoy. They also come with better services such as air conditioning, heating, bike racks, seating arrangement and wheelchair accessibility.

## **4.2 Infrastructure Upgrades**

Regina has allotted thirty-five million dollars for additions to infrastructure. These funds will go towards improvements to make public transit more convenient for riders. Primarily, funds will be spent on the construction of bus stop enclosures. With enclosures available, fewer riders will be deterred from riding during poor weather. Enclosures are necessary for the comfort and safety of the riders.

Enclosures and signage will be installed along the new routes. Only a fraction of the allotted thirty-five million dollars will be spent on all of the improvements.

## **5.0 Alternatives**

Analysis of various types of transportation and fuel sources were considered. Such considerations included the use of electric-diesel hybrid buses, and the use of bio-

diesels. At this point in time the costs of hybrid busses prove to not be economically viable. It is possible that hybrid buses may become a valuable investment after the proposed transit improvement plan has been implemented. Also, the use of bio-diesel is not a sustainable long-term option. The ethical dilemma regarding the use of bio-diesel was a factor in the decision against its use.

## **6.0 Conclusion**

As a consulting firm working for the city of Regina, we plan to implement a public transportation improvement strategy that meets the needs of Regina's goals to reduce its ecological footprint. The strategy explained in this report follows a conservative approach to meet Regina's goal. The solution is sure to improve transportation in Regina while reducing its impact on the environment.