



Regina Transit System Improvement

University of Saskatchewan Consulting

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Section 1: Introduction

1.1 Background

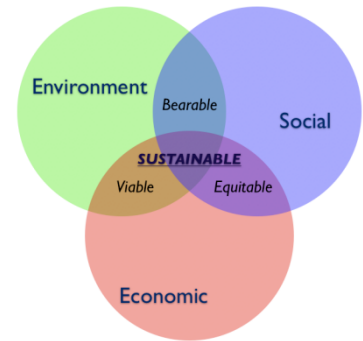
The growing City of Regina has hired University of Saskatchewan Consulting due to concerns about the environmental and social implications of increased traffic. The has charged the company with assessing the public transportation in Regina for the opportunity to improve the system. University of Saskatchewan Consulting's goal is to ensure that the City's transportation is scalable, sustainable, and able to adapt the changing demands of today's society.

1.2 Objectives

In assessing the City of Regina's transportation situation, the University of Saskatchewan Consulting has chosen to consider all implications. These implications are contained within the 'triple bottom line,' which considers not only the economic impact of the design, but the social and environmental impacts as well.

A sustainable transit design must attract ridership for income and reduce expense. Keeping maintenance and operations costs to a minimum is essential, but the design must consider that expense must be incurred to attract significant ridership. To justify what may seem like extraneous spending, one must consider the public perception of transit ridership. The design will encompass spending money on public awareness and advertising, as well as improving the aesthetic and ergonomic appeal of the fleet. The goal will be to cast transit ridership as a positive social status symbol as well as a comfortable and pleasurable alternative to personal transportation. The economic goal of the chosen design will be to balance income and expense, to create a cost neutral system that will be sustainable without requiring tax dollars to operate. The economic aspect of the triple bottom line, though, is the least important of the three. Above all else, the service must be provided well and at a low cost to the environment.

A well-designed transit system should be appealing to a wide variety of demographic groups and attract riders from multiple socioeconomic situations. For riders without personal vehicles, an efficient transit system can represent the ability to arrive in time to the career of their



choice. For riders with personal transportation, public transit can represent a less stressful or less costly option. The goal is to retain the current ridership and attract new ridership, but emphasis must be placed on new ridership to create a scalable transit system able to meet the challenges of a growing city. Many existing transit users will continue to use transit, and so one focus of the report is to ensure that as many people as possible consider taking transit or buying a transit pass.

There is growing concern in the world over the environmental sustainability of human society. Public transit is one of the largest opportunities to reduce the impact that humans have on the earth. Any riders that the transit system attracts are potential drivers that would be adding another vehicle's emissions to the air. Public transportation does still pollute, though, and consideration will be given to options that reduce the transit system's environmental cost.

1.3 Report Terminology

Throughout the report, the City of Regina, the proponent of the design, will be referred to as the City. The University of Regina will be referred to as the University. University of Saskatchewan Consulting will be referred to by the acronym USC.

Section 2: Design Specification

2.1 Evaluation Criteria

As stated above, the design will attempt to produce a favourable 'triple bottom line.' A successful design will be cost-neutral, so that that the transit system is self-contained and not reliant on taxpayer dollars. It will maintain current ridership as well as attract new ridership, and should appeal to multiple demographic groups, whether as an essential service or as a viable alternative to personal transport. An ideal design will also reduce the overall negative effect of human society on the environment, not only by attracting new riders that may have instead used personal transport, but also by reducing the environmental impact of the transit system itself by focusing on fuel efficiency and alternative fuels.

2.2 Design Alternatives

The nature of the problem is multifaceted and required multiple initiatives and decisions. Below is a list of divergences from the given design, along with the justification for why the decision was made to not implement that particular part of the scope of the design.

2.2.1 Use of Rail-based Transit Services

Given the size of Regina and the complications and cost of adding rail services, the design elected to focus instead on improving bus service in the city. In Regina, it takes "15 minutes to get anywhere by car," (Regina Transit Review Team, 2002) and there is not sufficient congestion to justify spending on a train to circumvent it.

2.2.2 Redesign of Bus Route Structure

Given our budget and the cost of redesigning the entire route structure of a city, we elected to focus on the existing bus routes, and how they might be improved. A redesign may reduce environmental impact

due to an increased adoption rate, but the change is, at this time, immeasurable, and USC suggests instead diverting capital to spend on tangible reductions.

2.2.3 Reducing Bus Service Hours

USC assessed the feasibility of reducing service hours to save on expenses. According to the report provided by the Regina Transit Review Team (2002), only 1% of the daily ridership uses the buses in these hours. However, given the limited nature of this data, it cannot and should not be assumed that the riders do not represent a sizable portion of the daily ridership as well. The problem in reducing service hours is that, if forced to find alternative transport in the evenings, the riders may buy cars and subsequently take their business, night and day, away from the Regina Transit System. In assessing the benefits of holding a bus pass, potential riders will likely consider how late the transit system is available, even when they do not predict that they will be using the evening services regularly.

2.3 Design Specifications

The final design of the USC will consist of a few components. First, there are changes to be made with the capital budget of \$10 million. The suggestion is to acquire new buses, and switch the whole fleet to B5 biodiesel, to reduce greenhouse gases produced by the fleet. There will also be a significant emphasis on the public image of the transit system, including external perception and superior service. Part of this will be an advertising campaign that will run for five years before being reassessed for any further value. We will also spend some of the capital on a dispatch system to improve the transit systems response to emergencies and other unique usage situations. The infrastructure budget of \$35 million will also be utilized to improve service and reduce costs. Asphalt failure is common near bus stops; as these problems are fixed, the plan is to implement concrete pads over the area where bus to stops to pick up passengers. We will spend money to improve the phone system, adding ways to interact with an electronic system through dial-menus, text messages, and the internet. As a part of this initiative, and as

a form of advertising/rebranding, we will replace the bus stop signs, including 4 digit codes that will be used with the new electronic system or with the existing phone operators. Finally, we will include a budget to add a traffic control system to some intersections, whereby at an intersection, the street containing the bus will be favoured to move the bus along faster.

Over ten years, we will spend \$9 million to buy 26 new buses for the fleet. Using biodiesel instead of conventional diesel fuel will reduce harmful emissions to the environment by 6.8% and wear in the engine by 21%. The cost of biodiesel is similar to conventional diesel but a small amount higher. The 2.7% return in fuel economy and reduced maintenance makes biodiesel attractive, and carries with it the added bonus of spending money in Canadian fuels. The numbers presented here are taken from Hertz (2006).

A large component of the plan the USC is proposing is to work on improving the public perception of public transit, mainly through local advertising. The project allots \$500 000 to advertisement with the intention that the advertising campaign will occur over 5 years, with the advertisements being filmed or designed in the first year for \$300 000 and run for \$50 000/year for the next five years. USC considers the transit system's public image a key component of its future and believes that the advertising campaign is a key element of the plan to improve.

To improve public image, there must also be tangible changes made that riders will notice when using the transit system. Transit systems must be made flexible to accommodate needs that do not occur every day. An average rider will have no sympathy for a transit system that lets a full bus pass by, leaving the person to wait for another half an hour for the next bus. USC proposes an easy to use dispatch system that drivers can draw on to ensure that all customers en route are being provided service. When a bus is full or almost full, a driver would phone dispatch, and dispatch would have a driver nearby that is able to pick customers up within 10 minutes of the full bus. A wait time of any

shorter than this is unrealistic, but any longer will be discouraging to potential customers. If a customer knows that the transit system is trying to take care of them, despite heavy loads, they will place more faith in the transit system and rely on it in more situations.

Road repair, especially in Saskatchewan, is a major expenditure. The asphalt typically used underneath bus stops is much weaker in shear strength than concrete. Because of the large amount of stopping and starting that occurs at bus stops, concrete beds are a more appropriate structure that will extend the life cycle of the material underneath the bus stop.

It is important to improve interaction with all customers. Nearly half of the transit users in Regina are aged under 25 (Regina Transit Review Team, 2002), and a large number are presumably comfortable with electronic systems. A redesign of the RIDE Line will include electronic systems that can be interacted with through electronic means, including phone dial menus, text messaging systems, and an internet interface. The human operators will be retained to interact with those who would prefer to work with humans. The new system will utilize a 4-digit bus-stop identification code that will be clearly visible on the new signs.

As a part of the advertising campaign, bus stops will be rebranded and redesigned to contain more information. This will have the dual benefit of both putting a new face on the transit system, and helping riders to become accustomed to the new 4-digit stop identification, which they will use to interact with the Transit RIDE Line. To save costs, some low traffic signs could be affixed with a sticker displaying the 4-digit stop ID until such a time as there is more capital available to implement a new sign.

To speed buses along, some money is allocated to intelligent traffic systems, installing a communication channel between approaching buses and certain intersections. The idea behind this implementation is that buses will communicate their approach to a busy intersection, which will then adjust its timing to accommodate the bus and get it through the intersection faster by shortening the green light of the

perpendicular street. Precise numbers were not available for this type of installation, so instead there is \$1 million allocated to the purchase and installation and this can be spent as available.

Section 3: Additional Project Concerns

3.1 Environmental Implications

3.1.1 Operating biodiesel buses

The impact of operating buses using a bio-fuel mixture will be minimal. Issues that have been raised are outlined in later sections of this report.

3.1.2 Construction of concrete pads at bus stops

The construction phase of the pads is when the majority of environmental issues will arise, as this is the most active time during the service life of the pad. Concerns are construction noise, potential fuel spills, and removal of asphalt waster removal.

3.2 Social Implications

3.2.1 Operating biodiesel buses

Regina is a modern city and the use of biodiesel as an alternative fuel source should invoke a positive social response. Many of the local citizens have ties to the surrounding agricultural community from where the biodiesel is produced, benefiting from the regional economic stimulus.

3.2.2 Construction of concrete pads at bus stops

The construction of the concrete pads will not have any large impact in the urban environment of Regina as regular street maintenance and construction is common occurrence in the summer months.

3.3 Economic

3.3.1 Operating biodiesel buses

Biodiesel in Saskatchewan is primarily made from non-food grade canola, which is a renewable resource. This adds another product stream for canola producers in the province as biodiesel can be produced locally, providing regional economic stimulus.

3.3.2 Construction of concrete pads at bus stops

Replacing the existing asphalt surface at bus stops with concrete will lengthen the lifespan of the road at that location. Maintenance costs associated with asphalt failures and fixing potholes will be reduced.

Section 4: Conclusion

4.1 Conclusion

University of Saskatchewan Consulting ultimately concluded that it is not one large change in the Regina Transit system, but a series of smaller changes that will attract new customers and retain current customers. USC also suggests spending money on an advertising campaign to put forth an improved public image. Through improved service, ease of use, and other small fundamental changes, the transit system will be serve the community with a lower environmental impact, a higher appeal to all demographics, and an overall reduction in cost. The extensive list of small improvements will serve the 'triple bottom line' by operating with a positive social, environmental, and economic impact:

- New buses to reduce advertising costs.
- Advertising and rebranding to attract new customers.
- A dispatch system to improve transit reaction to emergencies or special case scenarios.

- Electronic RIDE system, to access bus schedules with phone calls, text messages, and a user friendly website. This includes a bus stop 4 digit ID implementation.
- Concrete pads to reduce road wear caused by stopping buses.
- New bus stop signs, for rebranding and displaying the new 4 digit ID.
- Intelligent traffic systems, to improve transit time, encouraging customers to try the system.

4.2 Further Recommendations

One initiative that may be of further use in fostering a transit culture is to implement the U-Pass at the University of Regina. This is not under the jurisdiction of the City, but it is possible to recommend the program to the University for consideration. The U-Pass has been a success in many western Canadian cities, including nearby Saskatoon, a city similar in demographic makeup and population to Regina. The U-Pass is a university community bus pass program wherein all students are given a bus-pass, without choice, but offered at a significantly reduced rate. A study done by Urban Systems (2005) found that the U-Pass does foster a transit culture among university students and reduces automobile usage in university areas. The study also found that the net change in greenhouse emissions was a reduction. The U-Pass program would be an extension of the goals of the design presented in this document.

One challenge in implementing a 'bike' culture is the current road infrastructure. While USC considers recommending changing the existing roads unviable, the group maintains a recommendation to ensure that new roads are built with room for bikes considered. Fostering lifestyles free of motor vehicle usage involves presenting choices, and making roads friendlier to bicycles will encourage residents to consider biking to their destinations.

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