



**School Bus  
Consultants**

## TRANSPORTATION STUDY

Calgary Board of Education

February 19, 2016



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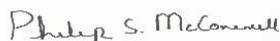
Mr. Dany Breton  
Superintendent, Facilities and Environmental Services  
Calgary Board of Education  
1221 8th Street SW  
Calgary, AB T2R 0L4

Dear Mr. Breton:

School Bus Consultants, LLC is pleased to submit the following observations, findings, and recommendations to assist the Calgary Board of Education with their development of a sustainable model for transportation services. The results of this study were based on observations and information obtained from onsite interviews and the analysis of data as provided by departmental and Board staff. The report is formatted in a manner to provide you and other senior and departmental managers with the information necessary to understand how well the system is currently operating and where there may be either opportunities for improvement or alternative models to consider.

The success of this type of study necessitates a high level of involvement from Board staff and the availability of quality data and information. We would like to take this opportunity to thank Dr. Donna Crawford for her excellent guidance into the current and past complexities of the transportation department. We would also like to thank Ms. Carrie Edwards and Mr. McArthur and the other members of the transportation staff as they were very willing to provide candid information and prompt and thorough responses to our many questions.

SBC looks forward to your thorough review of this document and the presentation of results to be scheduled at your convenience. Please do not hesitate to contact us with any questions, comments or concerns.

A handwritten signature in black ink that reads "Philip S. McLonnell". The signature is written in a cursive style and is positioned above a light yellow rectangular box.

Project Manager



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## Introduction

The Calgary Board of Education (CBE) provides educational services for more than 114,000 students across the City of Calgary. The Transportation Department is responsible for managing transportation services for approximately 28,400 regular and students with exceptional needs to over 220 schools and program locations. Additionally, Calgary Transit is utilized to transport approximately 11,000 secondary students to CBE schools and programs. Services are provided utilizing a contracted fleet of “yellow and black” school buses, taxis, specialized wheelchair equipped vehicles or handi-vans, and through the use of Calgary Transit buses and light-rail trains.

Board of Education staff are responsible for oversight of transportation services and the contractors that provide the service. These tasks and activities include the registration of students for transportation services, route planning and the daily management of routes and runs, assistance with student discipline, communication to stakeholders, and the oversight of the contractors including contract management and accounts payable activities.

## Background

Transportation services are provided within a complex transportation network requiring the transportation of students to programs not only within their assigned school of attendance but also to center based programs for students with exceptional needs and to alternative programs that draw students from all areas of the community. This complexity is also due to growth within the community that has resulted in the need to transport students across attendance boundaries to schools that can accommodate students from the schools that are currently over capacity.

In an effort to extend the sustainability of the existing model and operate within the available funding, operational changes were made for the start of the 2015-16 school that adjusted service levels and did not increase rider fees. The key service level change was the introduction of congregated stops, some with longer travel distances from home to the stop than the previous year. This change resulted in a potential reduction of 35 route buses at an estimated annual reduction of \$1,902,075 (35 buses x an estimated annual cost per bus of \$54,345 per year).

Based on concerns brought forward by parents after the start of school that included lengthy travel distances and longer than acceptable ride times, routes were adjusted and additional buses were added. Regardless of the program they attended, stops were added to ensure an alignment with the travel distances of 1.6 and 1.8 km for elementary and junior high students. This decision resulted in the necessity for up to 50 additional buses at approximately \$2,717,300 in additional costs. (Some routes may have been added due to growth or new routes for students with exceptional needs) While this strategy has resulted in a greater level of customer satisfaction, it is not sustainable given the current funding structure.

School Bus Consultants, LLC (SBC) was engaged by the CBE to conduct an assessment of the overall effectiveness and efficiency of the current routing system and the department in general. While this baseline understanding is necessary to understand the overall effectiveness and efficiency of the system as it currently operates, the prime objective of the engagement is to help the CBE develop a more sustainable transportation model within the constraints of the current Provincial funding structure. These objectives include the development of an implementation strategy and strategic plan beginning in 2016-17 that promotes continuous improvement and sustainable service delivery given available funding sources.

Following the initial collection of data, site visits were conducted to gain first-hand observations of the operation and

to review and collect additional data. The following report is the result of these observations and the quantitative analysis of provided data.

## Executive Summary

The following section summarizes the key observations, findings and recommendations related to the efficiency and effectiveness of the transportation system. The focus of these observations and recommendations is to develop a holistic picture of the administrative, operational, and financial requirements to cultivate an efficient and effective transportation operation.

### Policies, Regulations, and Communications

*Key Observation: While Administrative Regulations serve to document the basic criteria for the provision of service, they lack definitive parameters to guide the planning process and to support effective communications regarding the level of service and how services are to be delivered.*

Key recommendations for this area include:

1. An effort should be supported to collect, validate, and document informal processes and procedures that are currently in use across the department.
2. Once departmental processes, procedures, and guidelines are documented, their efficacy should be thoroughly reviewed to ensure that they remain pertinent and compliant with other CBE rules and regulations.
3. The development of Transportation Communications protocols should be considered a priority.
4. While the Transportation Services Procedures and Information Manual is an excellent first step, it should be expanded and be available to all stakeholders.

### Staffing Assessment

*Key Observation: Based on the size and complexity of the transportation operation for the CBE, the number of Route Scheduling positions and technical support personnel is well below industry standards.*

The initial and key observation is that for an operation that manages transportation for nearly 30,000 students with 1,100 routes using 800 buses, the number of staff that are dedicated to route planning is well below any industry standard. Additionally, as the department further implements new and enhanced routing software and supporting technology such as vehicle and student tracking systems, dedicated and specialized technical support staff will be required.

Key recommendations for this area include:

1. At least four additional Route Schedulers with the expertise in or the ability to master programs such as ArcGis and BusPlanner™ to support enhanced route planning and management activities.

2. For the department to implement and maintain software systems and the integration of supporting hardware, it is imperative that the following positions are fully staffed and dedicated to transportation functions:
  - a. Technical support for software and systems.
  - b. Systems management and maintenance i.e. the maintenance of the base map in the routing system must be updated as changes in the road network occur. In the absence of regular updates, the accuracy of planned routing solutions and the integrity of the overall routing network can rapidly degrade.
3. A systematic approach to the skills enhancement of incumbent staff should be considered. Training should not only be for new technologies but also on key district functions such as budgeting, reporting, and strategic planning.

### The Use of Technology and Data Management

*Key Observation: Although transportation staff have access to a variety of technology tools, the full benefit of the technologies is not being achieved due to the lack of an implementation plan, tech support, and training.*

Key findings and recommendations include:

1. To obtain the full potential of the available technologies, a strategic plan for the implementation of new technology tools and the re-implementation of existing technologies should be developed.
2. A systematic approach should be developed to “centralize” the data management and reporting processes. This approach should include the data that is internal to the department such as student, bus, and route data but also line item expenditure and other financial data. This would help to ensure that there is single point of contact (within the department) for the retrieval of key reporting and measurement data, and that the available data is accurate and consistent
3. Processes and procedures regarding the use of technology should be fully documented.
4. A technology plan for the department should be developed and integrated into the overall goals for the CBE.

### Routing Efficiency Analysis

*Key Observation: Route designs are victim to policy and technology constraints. On average, the system is adequately efficient by most metrics, however the system is large and within it there are opportunities to improve efficiencies.*

Data was analyzed for all of the regular and alternative program routes, for which data is regularly updated and monitored. From this data, an average capacity utilization of 81 percent was found based on two students per seat. Additionally, routes are not long, with over three quarters of routes lasting for less than 40 minutes. These are typical findings of systems that are of high service quality. Opportunities to retain this

level of service while improving overall efficiency are not necessarily routing problems.

Policy constraints such as eligibility for special programs and bell times cut down on efficiencies. Across over 600 routes studied in the analysis, only half were able to be “paired” or sequenced with another route during a shift. This is largely because bell times throughout the schools desiring transportation are not aligned strategically for transportation logistics. Also, certain programs are attended by students from broader attendance areas, creating long routes with low ridership because the density is lowered.

Lastly, the lack of a fully implemented comprehensive routing software package creates inefficiencies in the route planning process. The existing processes are designed to manage the system, and are relatively effective in doing so. However, a centralized database of route and student information can manage routes but also aggressively identify route design efficiencies, consolidation opportunities, and pairing opportunities.

Key findings and recommendations include:

1. Investigate areas where bell or program times, as well as facilities can be adjusted to positively affect transportation efficiency. This is a long term goal with no immediate opportunity, however important to consider during such discussions.
2. Continue to find opportunities for shared services with Calgary Transit. While yellow bus operations may or may not remain on existing contracts, the typical transit style routes can be tweaked or designed to offer services to more students.
3. Continue to implement a centralized routing technology that incorporates GPS data from buses in live time, a regularly updated student database, and effective base maps for accurate routing and scheduling.

## Financial Analysis

*Key Observation: Based on the current funding formula and fee structure, CBE transportation will continue to operate with a deficit absent the increase in provincial funding, student fees, increased routing efficiency, and/or a decrease in service.*

For the fiscal year 2014-15 the cost of transportation was calculated to be \$11,068,941 for regular education service, \$14,461,678 for students with exceptional needs, \$18,054,196 for students attending alternative programs, and \$1,645,172 for Calgary Transit rebates and waivers for a total annual cost of \$45,229,988. The annual cost per bus for all types of transportation was calculated to be \$54,345 with the average annual cost per student of \$1,534.

While the average annual cost for a regular education student at \$819 per year is reasonable, the cost of students with exceptional needs at \$7,611 and alternative program students at \$1,388 per year account for the overall higher than expected cost per student of \$1,534. The cost per student for regular education and alternative program students is the direct result of having to transport students out of their assigned school zone either due to program location or overcrowding.

The key recommendations for the area include:

1. While an increase in the fee for service is likely to meet with resistance, it is within the control of



CBE and the rationale can be clearly illustrated.

2. The processes for the waiver of fees must continue to ensure that only families that meet clear financial guidelines are granted waivers and that Principal waivers should be granted based on well-defined criteria ensuring equal and equitable application across the system.
3. Support the recommendation for an increase in departmental staff and especially in the area of route planning. As discussed above, for every bus that is removed from service due to improved route planning, an average of \$54,345 could be saved.

## Contract Management

*Key Observation: The current contract and the recently developed Request for Proposals - Student Transportation Services overall set the stage for effective and efficient delivery of transportation services.*

The key findings and recommendations related to Contract management are focused on a combination of concerns related to the contractual agreement and the manner in which CBE oversees the agreement. Specific concerns include:

1. A key element of the current Master Agreement that is found in Article 8 – Audits, does not appear in the draft Request for Proposals (RFP) or Form of Agreement. This article clearly defines the right of the CBE to review and audit the following:
  - i. Carrier records and supporting documents to ensure that the terms of the Master Agreement and YSA are being met or exceeded.
  - ii. The inspection of the facilities of the carrier.
  - iii. Employment records of personnel providing service the Board.
  - iv. Audits by CBE staff will not occur more than once annually.

This article should be reexamined and inserted into the RFP and Form of Contract. It is also recommended that the CBE reserves the right to conduct audits at any time during the course of the year where in the Board's judgment, that performance or safety related issues warrant an auditing of the carrier.

2. Fleet age maximums or the average age of the fleet is not discussed or described within either the draft RFP, Form of Agreement, of the Yearly Service Agreements. The establishment of fleet standards is important for multiple reasons including:
  - i. Newer buses have the benefit of improved safety and emissions equipment compared to older vehicles.
  - ii. Newer vehicles generally are more reliable resulting in less down time due to mechanical failure and maintenance.
  - iii. Newer vehicles generally provide a greater level of student comfort due to advances in seating, and heating and air conditioning systems.

## Alternative Service Delivery Models

It is apparent that the CBE is highly motivated to examine and implement improvements within its transportation operation while maintaining its high level of service. Concurrent with the start of this evaluation, the CBE met with senior managers of Calgary Transit to explore mutual opportunities for collaboration. This could range from increasing routes served by CTS up to the consideration of entering into a service provider agreement. Under a service provider agreement with Calgary Transit, all operational aspects of providing student transportation could be under the auspices of Calgary Transit. SBC was provided an opportunity to attend several of the preliminary meetings with CT and CBE representatives. CT expressed their understanding of K-12 transportation and how they feel they could be of value to the CBE as summarized below:

- Calgary Transit (CT) expressed that they have a high level of understanding of the unique requirements of K-12 pupil transportation. This understanding is in part due to providing service to secondary students but most importantly due to the fact that this concept was previously piloted in 1996. While the pilot was considered to be a success, no formal service provider agreement was signed nor was there any remuneration provided to Calgary Transit for managing the service.
- CT has embraced the use of technology throughout its organization and could transfer the benefits of their systems and their expertise in its use to ensure that K-12 transportation is operated in a manner that is both effective and efficient.
- The CT organization is of the size that it employs specialists in each of the key management and operational areas of an effective transportation operation. Examples include communications and media specialists, route planners, data analysts, technical support staff, and staff with expertise in strategic planning.
- CT expressed full understanding of the specific needs of the CBE regarding the concern for student safety at stop locations and while in transit being the most notable.
- CT views this form of collaboration as a great benefit to the City of Calgary as a whole and expressed these key points:
  - Collaboration would provide the best value and service to the community, further stating that it is “the right thing to do”.
  - That the CBE and CT share common values in trying to provide the best service possible to the customers they serve.
  - Collaboration would ensure greater sustainability for both organizations and would be mutually beneficial.

While SBC would agree that the potential for a mutually beneficial relationship appears to exist, several key areas would need further analysis and discussion. These include:

- Cost and service benefits would need to be fully analyzed to ensure that service standards would be maintained or enhanced and that cost savings are truly achievable.



- Services would need to be provided in a manner that fully aligns to CBE educational goals and safety standards.
- Methodologies would need to be designed to ensure enforcement of CBE policies and regulations.
- As the accountability for the service would remain with the CBE, a number of CBE transportation staff would need to be retained. Positions would include specialists in the area of contract management, performance analysis, and reporting.

Each of these findings and the resulting recommendations will be discussed in greater detail in the following report sections.

## Policies, Regulations, and Communications

A necessary starting point for the evaluation of any transportation program is to first understand the core inputs to and functions of the operation. For any transportation operation, service expectations as defined in policy and implementation practices as defined in operating procedures represents those core inputs. This is particularly necessary when a core expectation is also the evaluation of alternative service delivery options to ensure that the comparisons made are both reliable and valid. To gain a fundamental understanding of how the department operates across its core operational areas, a general review of policies, procedures, and guidelines for the transportation operation as a whole is necessary.

An important attribute common to most effective and efficient transportation organizations is the direction and guidance that is received from documented and enforced policies, procedures, and guidelines. Board of Education policies and administrative regulations are necessary to clearly establish the level of services that are to be provided while departmental procedures and guidelines should clearly describe and define how those services will actually be delivered. Defined and documented service level parameters can be especially important in an operation where services are contracted and drivers and other key operational staff are not direct employees of the Board.

Operational and service level benefits of documented policies, procedures, and guidelines include:

- Ensuring that an equitable level of service is provided regardless of the service provider. This can be especially true of an operation such as the CBE where more than one contractor is responsible for providing service;
- Support for budget integrity by ensuring that the level of service that is delivered is within the limits and constraints of available funding;
- Providing clearly defined and communicated service standards to stakeholders (parents, students, schools, and contractors) resulting in clearly established service level expectations;
- Reducing the amount of time that is required to respond to questions or mitigating complaints based on the level of service provided;
- Ensuring that transportation is planned and delivered within well-defined safety rules and parameters; and
- That the school bus and vehicle fleet is maintained to contractual and provincial standards and replaced at intervals that support a high level of safety, comfort, and reliability.

### Results – Policies, Regulations, and Communications

The array and specificity of transportation policies, regulations, procedures, and guidelines varies greatly amongst transportation operations throughout Canada. This variability exists regardless of the size the operation or the service delivery model. While this variability exists, several common service level parameters that are usually defined and documented include eligibility, maximum ride times, arrival and departure time standards, loading parameters, and safety.

The evaluation included a review of CBE Board administrative regulations and an evaluation of the departmental handbook. Departmental and stakeholder guidance is derived primarily from CBE Administrative Regulation 6095 – Student Transportation and Administrative Regulation 6096 – Transportation Responsibilities and School Bus Rules and Administrative Regulation 6095 – Student Transportation. One best practice that is immediately noted is that each of the regulations clearly documents when the regulation was originally approved and/or when it became effective and also the dates of any revisions. This practice ensures that policies and regulations remain relevant as changes in program, funding, or service levels occur.

### Administrative Regulation

*Key Observation: Existing Administrative Regulations serve to document the basic criteria for the provision of service, but they lack definitive parameters to guide the planning process and to support effective communications regarding the level of service and how services are to be delivered.*

Tables 1 and 2 briefly summarize the current regulations while Table 3 provides suggestions for improvement to support effective and service delivery to reduce the potential for issues or concerns that may arise due to the lack of clarity or documentation at either the Board or departmental level.

**Table 1: Summary - Regulation 6095**

Regulation 6095	
Parameter	Summary
Student transportation fees	Establishes that independent students and parents who receive subsidized transportation must pay the student transportation fee. The statement further establishes that a waiver of transportation fees may be possible.
Waiver of eligibility requirements	While a waiver of eligibility requirements may be possible, parents remain responsible for the payment of the transportation fee.
Eligibility	The regulation establishes eligibility as follows: <ul style="list-style-type: none"> <li>• Students who attend their attendance area school, designated school or directed school and who live within the transportation service area.</li> <li>• Students who are in a special education program or who have a severe permanent disability, and who attend their directed school, if the student's application for transportation has been approved by the Area Learning Team or the manager of transportation services.</li> <li>• Students who, for disciplinary reasons, are enrolled at or directed to attend a school other than their designated school,</li> <li>• Students who are in grades 10 to 12 and live beyond 2.4 kilometres from the school that they attend, if public transportation is available in that community; and students who are in grades 10 to 12 and live beyond 2.4 kilometres from their regular program, or CBE designated alternative program attendance area school, if public transportation is not available in that community.</li> </ul>
Parent responsibility	The parent's responsibility for ensuring student safety to and from the stop is clearly established. Responsibility for the provision of transportation for ineligible students is also documented.

Regulation 6095	
Parameter	Summary
Conditional riders	Students from Kindergarten to Grade 9 may apply for transportation providing that there is space on the bus, a suitable stop is already in existence, and that the parent agrees to provide supervision and the payment of the transportation fee.
Occasional riders	Principals are delegated to authorize occasional transportation providing there is space on the bus, the bus is not required to deviate from its established route or stop schedule, and the request is infrequent.
Transportation schedules	Transportation schedules are to be established on an annual basis by the manager of transportation in consultation with area directors and school principals. A key and fundamental parameter that is established by this regulation is that changes in the school schedule that occur in August or September must be communicated to the transportation manager by June 30 of the prior school year.
School bus stops	<ul style="list-style-type: none"> <li>• Based on Section 273 of the School Act, only one school bus stop will be established for a student.</li> <li>• Student safety is considered of prime importance when stops are located including:               <ul style="list-style-type: none"> <li>○ Traffic safety considerations for bus loading and unloading;</li> <li>○ The number of students assigned to each stop;</li> <li>○ The use of public areas on main collector roads where possible; and</li> <li>○ Minimizing the inconvenience to the public.</li> </ul> </li> <li>• Travel distances to bus stops are established as follows:               <ul style="list-style-type: none"> <li>○ Kindergarten and elementary students: Approximately 800 meters or more.</li> <li>○ Junior high school students: Approximately 1,600 meters or more.</li> <li>○ Kindergarten to junior high school students who are enrolled in an alternative program, may be required to travel farther than 800 meters or 1,600 from their home to a congregated stop.</li> </ul> </li> </ul> <p><b>NOTE: Current practice is not in alignment with the regulation.</b></p>
Student transportation discipline	The statement establishes that the student is responsible to the principal for their behavior and conduct will being transported.
Transportation concerns, complaints, and appeal procedures	The processes for the reporting of concerns and appeals regarding fees are clearly explained within the regulation.

Table 2: Summary – Regulation 6095

Regulation 6096	
Stakeholders	Summary
Parents	General information section - Includes references to the application for transportation process, bus stop change request, the process to express concerns or issues, questions regarding student discipline, and the waiver application process.
Students	The statement establishes that the school bus is to be considered an extension of the classroom in regards to student behavior expectations and for the purpose of student discipline.

Regulation 6096	
Stakeholders	Summary
Principals – Key responsibilities include:	<ul style="list-style-type: none"> <li>• The supervision of the loading/unloading process for students from K to Grade 6.</li> <li>• Conducting a school bus roll call as deemed necessary.</li> <li>• The principal may assign a specific school bus route, school bus stop or seat on the school bus to any or all students accessing subsidized school bus transportation.</li> <li>• Notifying the Manager of Transportation of any student behavior violations which are considered to be serious</li> </ul>
Contracted carriers – Responsibilities include:	<ul style="list-style-type: none"> <li>• Provide transportation service that meet or exceed all requirement of the “Master Transportation Agreement”, yearly service agreements, and all relevant legislation.</li> <li>• Responsible for school bus operations</li> </ul>
School bus rules –	<ul style="list-style-type: none"> <li>• Students being responsible for their behavior.</li> <li>• Consequences for the failures to follow bus rules or driver directions including:               <ul style="list-style-type: none"> <li>○ The loss of transportation privileges.</li> <li>○ The assignment of a seat by the driver.</li> </ul> </li> </ul>

*Opportunities for Improvement:*

While the Board of Education Regulations 6095 and 6096 generally describe eligibility parameters, the fee for service requirements, and stakeholder responsibilities, they do not provide the level of detail that is necessary to support a more effective planning process. Examples of the parameters that should either be established or further defined or clarified are summarized in the following **Table 3**:

Table 3: Regulation Enhancement Summary

Parameter	Enhancements or Clarification Required	Why is it important?
Eligibility	<ul style="list-style-type: none"> <li>Regulations do not clearly define that provincial funding is only provided for students who live a distance greater than 2.4 km from their designated school.</li> <li>The current established distance parameters of 1.4 to 7 km (depending on the program) are not documented in the eligibility section and do not match current limits.</li> </ul>	<ul style="list-style-type: none"> <li>Supports safe and effective transportation planning.</li> <li>Clearly defines expectations to stakeholders.</li> <li>May promote greater stakeholder understanding of the rationale when necessary changes are contemplated to meet budgetary constraints.</li> </ul>
Ride Time Parameters	<ul style="list-style-type: none"> <li>Student ride times are a key indication of the level of service that is to be provided. Currently ride time goals are not documented in the regulations.</li> </ul>	<ul style="list-style-type: none"> <li>The formal establishment of ride time parameters should be considered to support planning activities ensuring both equitable service and the clear communication of expectations to stakeholders.</li> </ul>
Arrival and Departure Windows	<ul style="list-style-type: none"> <li>The amount of time that a student can be dropped off prior to the start of school or the time that is allotted for pick-up at the conclusion of the school day is not documented.</li> </ul>	<ul style="list-style-type: none"> <li>While student ride times are a prime indication of the level of service, arrival and departure time windows must also be considered to ensure that students are properly supervised and that the length of the educational day is maintained.</li> </ul>
Loading parameters	<ul style="list-style-type: none"> <li>Clearly establishing the expected number of students to a seat by grade level.</li> </ul>	<ul style="list-style-type: none"> <li>Supports effective planning and student comfort.</li> </ul>
Stakeholder Communications	<ul style="list-style-type: none"> <li>The establishment of clear protocols for the communication to stakeholders. Prime examples include: contemplated changes in bell times, attendance areas, and walk distances.</li> </ul>	<ul style="list-style-type: none"> <li>Ensures that stakeholders are well informed prior to the implementation of change.</li> <li>Ensures that the CBE is fully informed of the stakeholders concerns prior to implementation.</li> </ul>

While there are no national or industry standards for the various parameters discussed in **Table 3**, common practices as established by the transportation reforms in Ontario are presented as *Appendix 2* for illustration.

#### Departmental and Stakeholder Communications

Intra-departmental and external communications to stakeholders is a key and fundamental trait of a high performing transportation organization. Providing stakeholders with ready access to information regarding



routine operations and timely notification as changes in how services are to be delivered or as new initiatives are being considered is absolutely essential. As previously stated, Board level policies should determine and document the level of services that can be provided while departmental procedures and protocols are necessary to provide guidance to all departmental staff and external stakeholders. CBE has established a number of supporting procedures and manuals. Existing materials are described below.

**Departmental Handbook:** The department has developed a Transportation Services Procedures and Information Manual to support school staff in their understanding of transportation related processes and procedures. The manual is indexed and tabbed providing the user with quick access to specific information by subject matter. As an example, the manual begins by providing a general information section followed by a discussion on important parameters such as eligibility standards followed by the various transportation related processes and procedures. Examples of these include:

- Bus stop change request form – Includes the establishment of decision timelines depending on the point in the school year.
- Contracted Students Master List- Describes the responsibility of school staff to forward a list of students who are riding the bus but who do not appear on the master list. The impetus of this process is to ensure that all students being provided service have completed the School Bus Transportation Contract and that fees are collected.
- Lost bus passes – The process includes the issuance of a temporary bus pass, the completion of the Request for Replacement Bus Pass Form and the payment of the replacement fee.
- Conditional riders – Further defines the procedure for the application and approval of transportation for conditional riders.

Other important information is easily found by using the index and within specific tabbed sections. These sections include the following:

- Quick Reference Guide – Provides ready contact information to departmental staff including emergency numbers.
- Glossary of Terms – Useful definition of the terminology used by the department to promote a greater understanding of how services are planned and delivered.
- Bus Routes and Maps / Forms and Templates / FAQ's – Documents that are primarily available online.
- Emergency procedures – Includes emergency protocols, required actions, and contact information.
- CBE Board level initiatives and regulations – Operational expectations.
- Transportation rules and regulations.

**Process Flow Documentation:** One excellent practice is the documentation of key procedures in a flow chart format to support departmental staff in the implementation of processes and to enhance communications with stakeholders on shared or dependent tasks.

**Departmental Staff Meetings:** Departmental staff meetings are held on a weekly or regular basis and are designed to provide a forum for both the sharing of information between staff members and also as an avenue to provide training to staff members as changes in processes and procedures occur or new initiatives are being introduced.

While the handbook, process flow documentation, and departmental meetings are all positive elements of an effective operation, they are primarily designed for internal stakeholders. The development of a similar manual for parents and students, and the bus operators would help to ensure that all stakeholders are equally informed in how transportation services are managed and delivered. The following *Communication Protocol* discussion is another example of how current procedure documentation efforts should be enhanced.

#### Communication Protocol

One area that is clearly absent within the manual is documented and approved communication protocols. Communication protocols ensure that *all* stakeholders and especially parents and students are notified in a timely manner to ensure that stakeholders have an opportunity to present input and potential obstacles to recommended changes or new initiatives. Using the management of bell times as an example, a model bell time management and communication protocol contains the following key elements:

1. **Statement of purpose:** The protocol begins with a statement of purpose. As in the case of bell times, this includes the philosophy that a key responsibility of an effective transportation is to perform an annual review of bus routes to identify and implement efficiencies that result in the reduction of buses and/or improvements in service.
2. **Timelines:** Timelines for all stakeholders of the process are documented. Examples include:
  - a. Evaluation timeline is established for the supporting analytical work.
  - b. Timelines for presentation, stakeholder input, approvals, and implementation are established.
3. **Presentation and communication of the potential changes:** In the event that changes are to be recommended, the Transportation Manager is responsible for presenting the proposed changes to senior administration. The process includes fully describing the rationale for the change and the potential cost or operational benefit.
  - a. Issues with the proposed changes will be fully considered. This process is used to determine if further stakeholder outreach is required. As an example and again using a change in bell times as an example, if the request for a change in bell times originated as a school based request that has been fully vetted by the building administrator and parent communities, additional outreach may not be required.
  - b. Conversely, suggested changes that originate from either transportation or senior management, should have a documented process for community outreach. These presentations would again provide the rationale for the suggested change, and clear timelines for implementation.

- c. Once all stakeholder input is garnered and the initiatives or change have been approved, it is again imperative that clear communications to all stakeholders are provided.

Having communications protocols that align with the management of the operation in key areas such as bell time changes, changes in stop locations, changes in service levels etc. are necessary to ensure that all stakeholders are informed in a timely manner when changes are being contemplated. Communication of the this type will help to ensure that all stakeholders understand the rationale for a proposed change and the CBE administration can fully analyze and understand the potential risks or benefit when making substantive changes.

***Opportunities for Improvement:***

While the Transportation Services Procedures and Information Manual is an excellent first step in communicating the process and the procedures being used to plan and manage transportation services, the primary “targeted audience” is the school based staff. Given that other stakeholders including students and parents, contracted service providers, and departmental staff all require the same insights and understanding related to processes and procedures, an enhanced procedures manual should be considered that supports the information and documentation needs of all stakeholders.

### Conclusions and Recommendations: Policies, Regulations, and Communications

As will be referenced throughout the remainder of this report, defined and documented policies, regulations and departmental procedures and processes are necessary to support a more effective transportation operation as a whole and to improve communications with all levels of stakeholders.

In addition to the suggestions for improvement discussed within this section, the following global recommendations should also be considered:

1. An effort should be supported to collect and document informal processes and procedures that are currently in use across the department.
2. Once departmental processes, procedures, and guidelines are documented, their efficacy should be thoroughly reviewed to ensure that they remain pertinent and compliant with other district rules and regulations.
3. The development of Transportation Communication protocols should be considered a priority.
4. Once verified, all departmental policies, procedures, and guidelines should be approved by the Administration and inserted into the Transportation Services Procedures and Information Manual and a more general Transportation Handbook for distribution to parents and students.
5. These recommendations are of particular importance in the event that the CBE implements either a change in service levels utilizing the current delivery model or if the expanded use of Calgary Transit services is to be considered.
6. Upon approval, consideration should be given to posting transportation specific policies, procedures, and guidelines as a link on the department’s web page. The posting of these

documents will ensure ready access to information for stakeholders.

## Staffing Assessment

Regardless of the size of a pupil transportation operation or whether it is self-operated or outsourced, every transportation operation has four key functional requirements. These areas include:

- **Routing and Analysis:** Route planning and management staff responsible for the annual planning and daily management of effective routing solutions.
- **Administrative Support:** Responsibilities for the business functions such as timekeeping, attendance, and payroll.
- **Operations:** Management personnel responsible for both the strategic management and daily operational oversight of the department including:
  - Dispatch personnel to monitor daily operations ensuring that all routes and runs are completed as planned and that opportunities for improvement are identified;
  - On-road supervision and service monitoring; and
  - Training and compliance personnel to support both mandatory initial training and ongoing training requirements for staff.
- **Fleet Management and Maintenance:** Trained staffed in proportion to the number of vehicles to ensure that the fleet is maintained at or above mandated provincial, federal, and district standards. Responsibilities include:
  - Both preventative and reactive maintenance; and
  - Tracking of repair data and costs to ensure compliance to maintenance standards and to support replacement decisions.

The service delivery model that is currently in use by the CBE is fairly typical of the operations across Canada where the core functions of route planning and management and strategic planning for service delivery remain key responsibilities of the Board while the day-to-day bus operations including driver recruitment, training and supervision, fleet maintenance, and fleet replacement are all contractually enforced responsibilities of the contractor. The following **Figure 1** helps to illustrate how these core areas are currently managed between CBE and contracted staff.

Figure 1: CBE Student Transportation – Functional Responsibilities

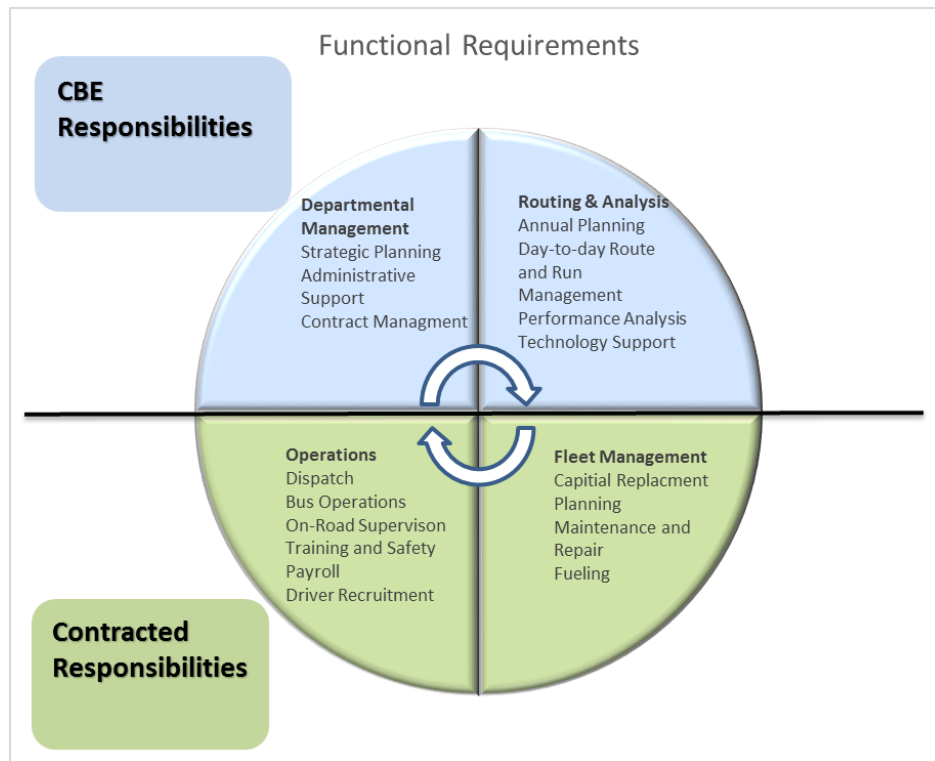


Figure 1 also helps to illustrate that although CBE staff and contracted staff have distinct responsibilities, there must be synergy between the entities for the operation as a whole to be fully effective and efficient. As an example, the value of the most effective and efficient routing solutions will not be fully realized absent a full cadre of bus drivers and reliable fleet assets. While each of the entities has separate management functions, there must also be a synergy in that area as well to ensure operational consistency.

## Results – Staffing Assessment

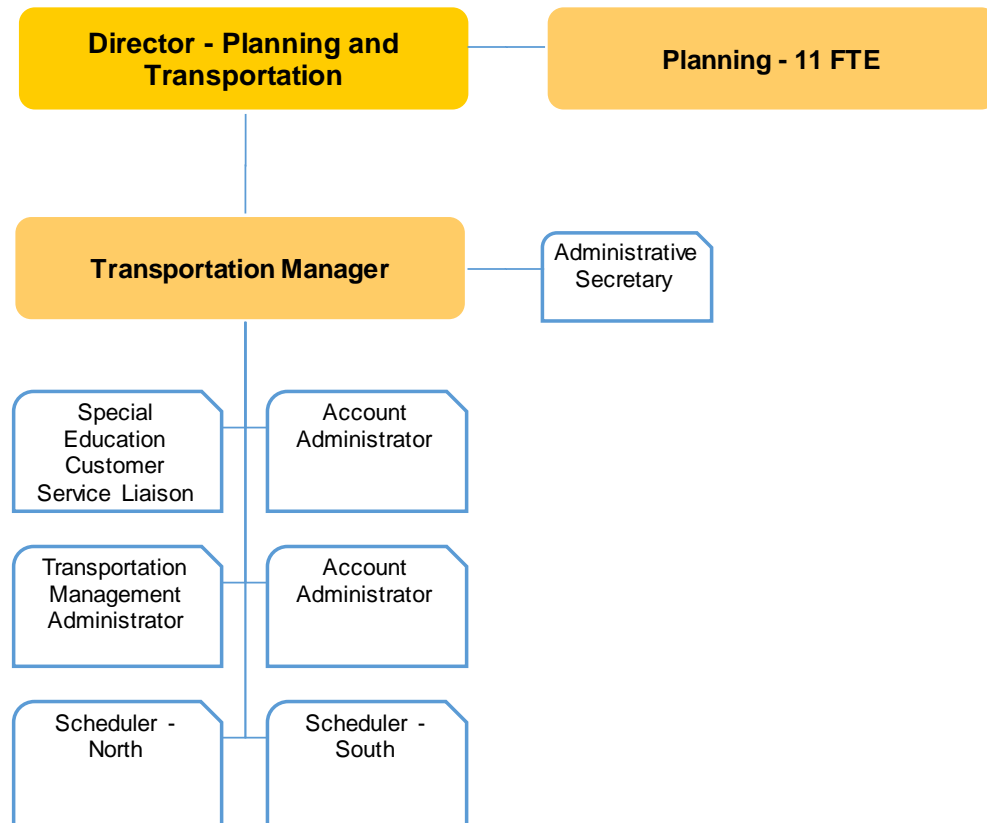
### Organizational Structure

*Key Observation: Especially in the area of route schedulers, the number of staff is well below industry standards.*

The Transportation Service Department for the CBE consists of eight full-time employees (FTE) that are responsible for the day-to-day oversight of transportation operations, annual planning, student registration (for transportation services) and the management of the contracted service providers. In addition to the eight FTE, the department is directly supervised by a one FTE Director who is also responsible for the Planning functions for the CBE. The organization of the department is illustrated in the following Figure 2:

Figure 2: Organizational Structure

## Functional Organizational Structure



The following **Table 4** summarizes staff duties as the department is currently structured and the number of recommended additional staff that are needed to support optimal performance.

Table 4: Current and Projected Staffing Needs

Function - Title	Common staff to bus ratio (FTE to Bus Count)	CBE Positions Assigned to the Function	Desired Number of FTE by Function (not by position title)	Current Number of FTE	Over (Under) Number of Desired FTE
Transportation Direction	1.0: 800+	<ul style="list-style-type: none"> <li>Director – Planning and Transportation</li> </ul>	1.0	.5	(.5)
Operations Management	1.0: 800+	<ul style="list-style-type: none"> <li>Director of Transportation</li> <li>Manager of Transportation</li> <li>Transportation Management Administrator</li> </ul>	1.0	1.0	-
Reg. Ed Routing	1.0: 150	<ul style="list-style-type: none"> <li>Scheduler – North</li> <li>Scheduler - South</li> </ul>	4.0+	2.0	(2.0)
Routing for Students with Exceptional Needs	1.0: 100	<ul style="list-style-type: none"> <li>Special Education – Customer Service Liaison</li> </ul>	3.0	1.0	(2.0)
Tech Support	1.0: 500	<ul style="list-style-type: none"> <li>Assigned to IT</li> </ul>	1.5	.5	(1.0)
Map/Systems Specialists	1.0: 150 to 500	<ul style="list-style-type: none"> <li>Transportation Management Administrator</li> <li>Tech Support</li> </ul>	1.5	1.0	(.5)
Performance Analysis	1.0: 150 to 500	<ul style="list-style-type: none"> <li>Shared between Manager and Schedulers</li> </ul>	1.5	0.0	(.5)
Administrative Support Payroll and Accounting	1.0: 150	<ul style="list-style-type: none"> <li>Administrative Secretary</li> <li>Account Administrator</li> </ul>	3.0	3.0	-
Field Trip Administration	1 to 150	<ul style="list-style-type: none"> <li>School Based Responsibility</li> </ul>	1.0	-	-
<b>Potential Number of Additional Staff</b>					<b>6.5 FTE</b>

The key observation is that for an operation that manages transportation for nearly 30,000 students with 1,100 routes using 800 buses, the number of staff that are dedicated to route planning is well below any industry standard. Additionally, as the department further implements new and enhanced routing software and supporting technology such as vehicle and student tracking systems, dedicated and specialized technical support staff will be required. These potential new staff members along with current staff will need additional training and support on the new technologies as discussed in the following section.

### Skills Assessment

The SBC team was tasked with an assessment of required skill sets of the employees that comprise the administrative and office support staff for the Transportation Department. The previous section was designed to first describe an ideal organizational structure and secondly to provide a point of comparison to the current CBE organizational structure with an overall goal of designing a structure that supports effective, efficient transportation within a culture of continuous improvement.

This process was designed to further support these goals through the evaluation of the skill sets and abilities of the incumbents to perform the specific core functions as discussed above and summarized below:

- **Operations:** Personnel responsible for both the strategic management and daily operational oversight of the department.
- **Routing and Analysis:** Route planning and management staff responsible for the annual planning and daily management of effective routing solutions
- **Administrative Support:** Responsible for the business functions of the department.

It should be noted that the conclusions for this assessment were based on qualitative observations and discussions absent the benefit of a formal skills testing procedure. Due to the fact that this evaluation is directly related to individuals within the department and that the results may become part of an individual's private employment file, the information will be presented as *Appendix 3* and will only be available to the appropriate CBE managers and administrators.

As this assessment helped to illustrate, training support will be necessary as the department further implements current and new technologies. Training is especially necessary for the use of route planning software in order to fully achieve the potential benefits of the system. Examples of the advanced and targeted training that will be necessary include:

- The day-to-day use of system including adding new students, changes in addresses, and removal of students who no longer attend school or require transportation.
- Route planning and optimization.
- System maintenance to ensure the accuracy of base map and the overall integrity of the system.
- The analysis of data and reporting.

### Conclusions and Recommendations: Departmental Staffing

A level of staffing with the appropriate level of training and expertise is necessary not only to support effective and efficient day-to-day operations but as important, to ensure that the new technologies are implemented in a manner that fully capitalize on the investment. To achieve these goals, the CBE should consider the following:

1. At least four additional Route Schedulers with the expertise in or the ability to master programs



such as ArcGis and BusPlanner™ should be hired. The additional staff is necessary to support enhanced route planning and management activities especially for the routing of students with exceptional needs.

2. For the department to implement and maintain software systems and the integration of supporting hardware, it is imperative that the following positions are fully staffed and dedicated to transportation functions:
  - a. Technical support for software and systems.
  - b. Systems management and maintenance i.e. the maintenance of the base map in the routing system must be updated as changes in the road network occur. In the absence of regular updates, the accuracy of planned routing solutions and the integrity of the overall routing network can rapidly degrade.
3. A systematic approach to the skills enhancement of incumbent staff should be considered. Training should not only be for new technologies but also on district functions such as budgeting, reporting, and strategic planning.
4. The preceding recommendations must be considered within the context of the other recommendations within this report. Specifically, if the CBE were to consider an alternative service delivery model as discussed at the conclusion of this report, the number and qualifications of transportation staff would be significantly different.

## The Use of Technology and Data Management

Information and its effective management can be one of the greatest tools for promoting efficiency in transportation operations. For systems as large and complex as CBE, the integration of valuable information and relevant technologies is a necessity. Modern routing software and databases are capable of storing large quantities of data related to students, routes, locations, and reports. Web based communication tools can assist operational staff and stakeholders alike by offering real-time access to current information regarding student's transportation services. The benefits are obvious, but many are never realized without proper implementation, maintenance, and operational processes.

At present, CBE transportation staff utilize a variety of technologies and processes to assist in managing the vast amounts of information. These range from highly technical and automated database processes to manual data entry and recordkeeping. One example of the impact of this is that no single database exists that effectively tracks all the necessary data points that are required for effective reporting and performance measurement. This fact became evident during the course of this evaluation as the data necessary to understand how the system operates had to be obtained from multiple sources and verified. The summaries below describe each of the programs used by staff in the transportation department.

### Software Use and Current Processes

Each of the transportation employees are equipped with a variety of software platforms to assist in route planning and other operational tasks. This software is supported by a contracted employee from the Department of Information Technology. Each is outlined below with a description of their purpose and any processes associated.

#### Versatrans Routing Software

This software was originally purchased and implemented as a route planning tool. Currently, there is no designated staff member responsible for upkeep of the Versatrans database within the transportation department. The department receives assistance from an information technology professional on an as needed basis to support the route database. Several interviews had indicated the software is not up to its current version, and most information held within the routing database is outdated.

Presently, CBE is in the process of switching to a different vendor for routing software. Interviews suggested that the Versatrans license is expiring in early 2016 and there are no plans to renew. The new vendor is providing a product that is similar in nature to Versatrans in many ways. The eventual goal is to use the newly acquired BusPlanner routing software for route planning, GPS tracking, and performance reporting.

#### Zonar GPS

Buses throughout the contracted fleet are currently piloting a Zonar GPS monitoring system. This system works by equipping each of the buses with a GPS unit, which transmits information about the location, current speed, and other attributes that can be used for routing analysis and operational support. Currently, transportation staff does not receive, nor do they have any written procedures in place for organizing and

managing the GPS information.

The Zonar software is related in part to the situation discussed in the previous section. The switch to a new routing software vendor was consciously timed in a way to go live as the Zonar pilot was concluding. Zonar units are capable of working with the new vendor's software and can show both live information, and input for route planning processes.

Presently, no deadlines or milestones pertaining to both Zonar and the routing software implementations are formalized. Any roles, responsibilities, and timelines associated with implementing these complex software and hardware components have not been communicated to transportation staff at the time of our interviews.

### ArcGIS

ArcGIS is a popular geographic information systems (GIS) software platform. It contains a regularly updated base-map with Calgary streets, waterways, school locations, railroad tracks, and other pertinent information for map creation. The maps created within this software represent a driving path for bus drivers to follow. Each route performed by the bus providers has a map that was created within this software. These maps are paired with a typed record of the stop locations, and their estimated times for morning and afternoon service. The records are typed in a separate word processing program.

Both Versatrans™ and BusPlanner™ are capable of producing route descriptions similar to the processes used within ArcGIS. Both maps and directions can be automatically created for each route through reports embedded in the software. These reports are typically at no cost with a software license. In addition, other tools can aid in ancillary processes involved in route planning such as optimizing route times, route designs, bus stop placement, boundary planning, and hazard mapping.

### Transportation Database

The database program commonly known as the "transportation database" is responsible for managing contract requests, payments, and the student information associated with this recordkeeping. It was designed by CBE employees and is maintained by the Department of Technology Services. Each of the departmental manager positions has full access.

Information stored in the database is supplied by the student information system (SIRS), and information regarding the contract information is added. The database also works with the ArcGIS mapping software discussed earlier. Within ArcGIS, there are boundaries representing the distances where students attending certain schools are eligible for transportation accommodations. When a contract is requested, students' addresses are sent through this map filter to determine eligibility.

The information stored in this database can be invaluable when introduced to route planning. Knowledge of where students live and what school they are attending are two fundamental components to designing a route. At present, no regular exchange of information between the processes occurs. The transportation database was referred to in many interviews as a financial tool. SBC believes that while this is true, applications beyond financial recordkeeping likely exist.

## Conclusions and Recommendations: Technology Use and Data Management

1. Transportation staff currently has access to a variety of underutilized technology tools. The technology owned and used by CBE is expansive. That said, the actual use of this technology could be greatly expanded to support the management of operations. The timing is opportune for corrections in how the department uses these tools to occur. New technologies and the implementation of BusPanner will require a well-documented approach to how they will be implemented and utilized to fully derive a benefit from each of the systems. Routing software systems are driven by two essential components, the map and the student information. The latter is arguably the most important, as it drives the student locations, route timing, and route paths. CBE staff should focus on integrating the student data captured in the transportation database with the routing software to provide for a systemic view of routing outcomes.
2. In conjunction with the evaluation of staff training enhancements and responsibilities as described in the previous section and as new technologies are introduced, a systematic approach should be developed to “centralize” the data management and reporting processes. This approach should include the data that is internal to the department such as student, bus, and route data but also line item expenditure data. This would help to ensure that there is single point of contact (within the department) and that the available data is accurate and consistent.
3. Implementation goals, target dates, responsibilities, and participants should be established and approved by CBE administration to support a clearer understanding of implementation expectations and resource allocation requirements among interdisciplinary departments. Interviews with transportation staff had not led us to a written implementation plan for the newly acquired software packages. Along the same vein, or perhaps causally related, is that the functional requirements of the transportation department may not be fully understood by the information technology department. Successful implementation of new initiatives is dependent on the collective understanding of the plan, its user goals and the steps required to get there. Much of the successful inter-departmental activity involves proprietary software built, owned, and operated by CBE. Areas for improvement include support for outside vendor software that is solely used by transportation staff. Accountability is important for all involved to appreciate the goals of each department, but these goals must be understood by all parties first and foremost.
4. Procedures and practices related to software use, data capturing, and reporting should be documented as part of the development of operating procedures discussed earlier in the report. Most current processes are done as a result of self-learned techniques or best practices. Minimal training on existing programs has been provided to staff. This observation and finding has been recognized by CBE administration and the implementation of new technology in the department provides the necessary impetus to establish procedural and operating norms as it relates to student, route, map and other transportation data.

The acquisition and implementation of the new routing software serves as a unique opportunity to modernize departmental practices related to technology use and data management. All stakeholders were clearly enthusiastic about providing updated technological capabilities to the

department, but the implementation process lacked clearly defined accountabilities, dependencies and timelines. Additionally, much of the focus was on the technical aspects of the implementation and inadequate attention had been given to the substantial work process changes that would require revision in the new technology-enabled environment. CBE should immediately focus on creating a structured implementation and integration plan for the new technology that incorporates both the technical support and process changes to ensure the department can receive maximum value from its investment.

Capturing data trends as they pertain to contract requests and waivers can begin to be captured in the routing software itself. As such, contract managers and route schedulers can be cross trained to understand how each system works. Data trends related to service issues can be captured in the hybrid use of Bus Planner and Zonar, however these reports and benchmarking tools must be established and documented. Highlighting repetitive service issues such as speeding, idling, deviation from the route, and late arrivals are all potential reporting tools that must be built and taught to employees throughout the implementation process.

## Routing Efficiency Analysis

The way in which bus routes are planned, designed, monitored, and managed will affect the overall efficiency of the operation drastically. Route planning or route scheduling is the starting point for all student transportation operations. Each year, routes are laid out based on a variety of constraints. The most notable constraints are the capacity of a bus, the ride time allowed by policy, and the bell schedule of the school for which the route is being designed. From within these constraints, efficient systems utilize as much of the bus's capacity as many times throughout the day as possible.

The routes serving CBE students are categorized in three ways. The first type of route is the “regular and alternative programs” route. The students served by these routes are generally Grade 9 and below and are attending a school that is far enough away deeming them eligible for transport. The second type of route is the “Kindergarten” route. These routes serve morning Kindergarteners returning to home or daycare, and afternoon Kindergarteners on their way to school during the middle of the day. Lastly, “Students with exceptional needs” routes are designed exclusively for students requiring transportation because of a disability or to a specialized program. Below is a summary of these routes by type, showing the quantity in operation daily.

**Table 5: Route Activity by Type**

Service Type	Routes
Regular and Alternative	656
Kindergarten	183
Students with Exceptional Needs	274

The largest group of the three types, regular and alternative routes, can be further analyzed to determine opportunities for efficiency improvements. These routes serve the general student population, while the other two categories serve the most specialized and fragile population within CBE. It should be noted that the total number of routes exceeds the actual count of buses, as some buses are able to perform more than one route in either the morning or afternoon time panel.

### Performance Indicators

The data used to assess the routing framework was from what is maintained by the schedulers who are responsible for route design and management. The schedulers coordinate with bus operators on a regular basis to ensure the currency and accuracy of pertinent information such as rider counts, up to date times, directional instructions, and maps. This information is stored in a spreadsheet and in a software mapping program called ESRI ArcGIS™. Using this data, the following summary statistics and performance indicators were calculated for the Regular and Alternative route grouping. The following **Table 6** illustrates the number of students utilizing transportation services in the morning time panel:

**Table 6: Routing Performance Indicators – Regular and Alternative Routes Only**

Metric	Value
Percentage of Enrolled Students utilizing Yellow Buses	22.4%
Percentage of Enrolled Students utilizing Calgary Transit	9.9%
Number of Buses	449
Number of Routes	656
Average Routes per Bus	1.5
Buses per 100 Students	1.8
Average Route Time (minutes)	0:31
Average Riders per Route	39

The top two statistics indicate a critically important contextual concern related to transportation. Less than one third of enrolled CBE students are transportation customers. Consequently, it is crucial to consider the impact of systemic changes that impact bus riders versus systemic changes that may impact all students.

When isolating on the transported population only, it is evident that CBE is providing quality services (as demonstrated by the average route time) but that there are constraints on service delivery that are introducing inefficiency (as indicated by the routes per bus and buses per 100 students metrics). An interpretation of the individual metrics and their interrelationships is included below.

#### Average Routes per Bus

Each route bus has effectively two peak periods throughout the day: the morning and afternoon. During each of these periods, effective operations utilize buses as often as possible. A highly optimized morning shift will have buses scheduled to deliver three different groups of students to three different schools. This is not always possible however, due to bell schedules or distances. In the case of CBE, the average bus is driving 1.5 routes. Rather, effectively half of the buses are driving one route, while the other half are driving two.

#### Buses per 100 Students

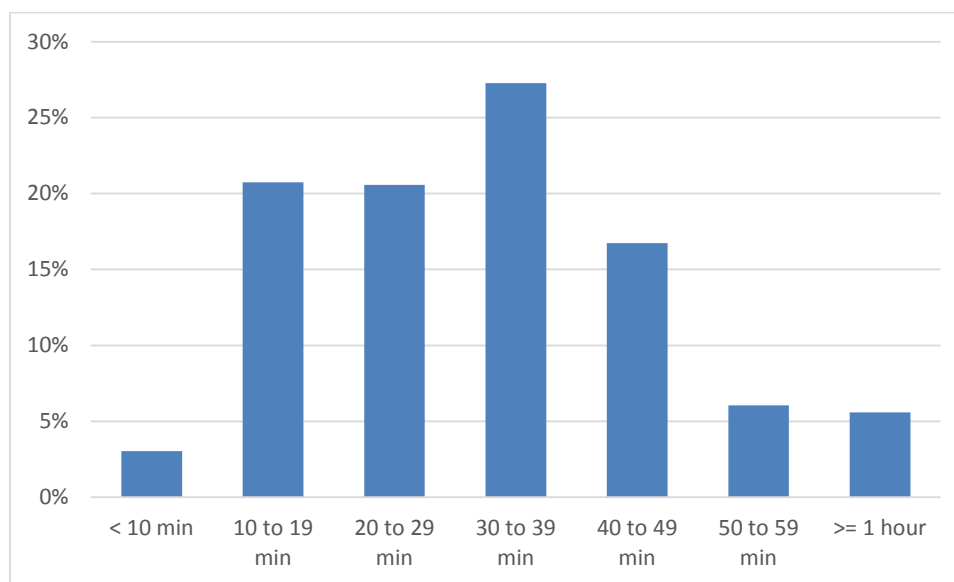
This metric is a composite indicator that looks at both seating capacity utilization and the number of times a bus is used throughout the routing scheme. Like golf, the lower scores for this metric are better as it indicates that given a fixed number of students, fewer buses are required to transport them. A value of between 1.0 and 1.3 for regular routes is indicative of an efficient operation. Typically, the lower numbers are seen with three tiered systems, where buses are utilized three times within a contiguous shift of work. In CBE's case, this metric can be correlated to the average riders per bus and the number of routes per bus. The CBE result of 1.8 buses per 100 students is indicative of system whose bell times are not fully aligned

to support more effective use of the fleet assets. Given the relative short rides times of 31 minutes, it appears that there may be opportunities for greater efficiencies through a more strategic staggering of bell times without a great impact on the level of service.

### Average Route Time

A straightforward metric, this represents the average time from first stop to the final school. It is important to note that it does not represent the average ride time for individual students. The average sometimes does not tell the whole story however, and that is especially true with large systems such as CBE. To understand the spread, the following **Figure 3** shows the percentage of routes meeting certain time criteria:

**Figure 3: Percent of Routes Meeting Time Criteria**



**Figure 3** shows that routes drastically vary in length. Over 40 percent of routes are less than 30 minutes in total length, meaning no student on those routes is riding the bus for longer than that, and many are riding for less time. On the other hand, over 10 percent of routes are longer than 50 minutes. Typically, these routes are serving specialized programs that draw students from vast areas. For example, the average ride time for the All Boys Program is 50 minutes. Below are specific programs or schools that have long route times, on average.

**Table 7: Schools and Programs with Longer Than Average Routes**

School/Program	Number of Routes	Average Route Time
Piitoayis Aboriginal Learning	6	0:53
Eugene Coste Spanish Bilingual	4	0:53



Lake Bonavista Montessori	2	0:54
Sir James Lougheed All Boys	10 (shared with Killarney)	0:58
Mayland Heights French Immersion	7 (shared with Bob Edwards)	1:02
Bowcroft German Bilingual	4	1:12

Route time is a useful metric for understanding systemic performance, but can be a less valuable indicator when evaluating service quality. This is due to the fact that route time represents the maximum constraint for the route and is not necessarily an indicator of how long students ride the bus. For example, assume a route has 40 students assigned to 2 stop locations. The first stop location has 39 students that depart the bus after 5 minutes and 1 student that rides for 50 minutes. In the chart above this route would show as a 50 minute route even though from a service perspective it would be very high quality because 39 of the 40 students only rode for 5 minutes.

In order to address this type of concern it would be typical to calculate both route time and average student ride time. However, existing data sources did not include sufficient detail to calculate this metric. After the implementation of the new routing software, CBE will be able to calculate these two key metrics in order to more fully assess operational performance.

#### Average Riders per Route

Knowing how many students are actually riding the routes on average throughout the system is also a key metric when assessing performance. While the fleet used throughout the CBE system varies in size, regular and alternative routes generally use full size buses. Given this, the 39 riders per bus represent a value of 81 percent of available capacity utilized. Most full size buses are rated for 72 passengers based on three students per bench. This equates to a 48 passenger capacity when planning for two students per bench. Like the previous metric, the routes are varied throughout the system. The chart below summarizes the percentage of routes fitting certain criteria.

Figure 4: Percent of Routes Meeting Ridership Criteria

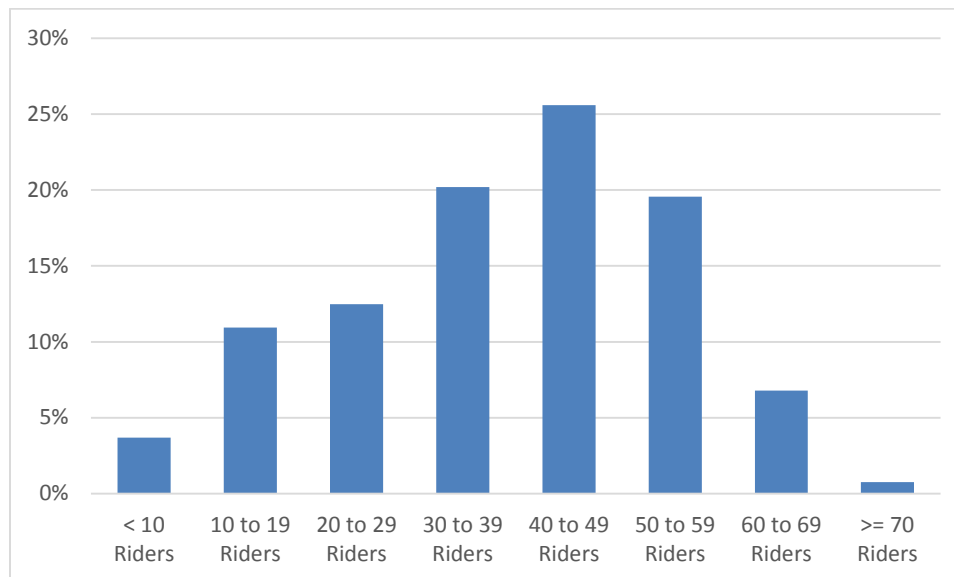


Figure 4 shows that the highest percentage of routes fit into the “40 to 49 riders” category. Very few routes have greater than 70 students riding, but 15 percent also have fewer than 20 riders assigned. Roughly 20 percent of routes are operating less than half full, with only one student per bench. Below is a table summarizing schools or programs where less than 50 percent of available capacity is utilized for routes serving that specific school. There are similarities between Tables 7 and 8 in which specialized programs hosted at the schools reduce the efficiency metrics.

Table 8: Schools and Programs with Longer Than Average Routes

School/Program	Number of Routes	Average Riders
Henry Wise Wood H.S.*	1	7
Dr. E. P. Scarlett H.S.*	1	10
Midnapore (Mandarin Bil)	5	12
Sir James Lougheed All Boys	10 (shared with Killarney)	13
Bowcroft (German Bil)	4	13
Capitol Hill**	1	16
Marion Carson (Mandarin)	5	16
Nose Creek**	1	19
Piitoayis (Aboriginal Learning)	6	20
The Hamptons**	1	20

W. O. Mitchell (Spanish Bil)	4	21
Rideau	1	22

\*Represents yellow bus where CTS not yet available

\*\* One route outside the walk limit to school

Many of the routes with low ridership are the only one serving that particular school. Rideau, The Hamptons, Nose Creek, Capitol Hill, Dr. E P Scarlett, and Henry Wise Wood only have one route for their schools. Some schools however, operate many routes for which bus seats are lightly utilized.

## Bell Times

The foundation for designing an efficient routing structure is the bell times of schools requiring transportation services. The routes are designed to deliver students to school with enough time to offload, with stop times estimated from that point. At present, CBE schools have a wide variety of start and end times. Below, a chart summarizes the percentage of regular and alternative routes that are arriving at schools during a particular window of time in the morning.

**Table 9: Routes and Morning Arrival Times**

Time of Arrival	Percent of Routes
7:40 to 7:50	16%
7:51 to 8:00	13%
8:01 to 8:10	11%
8:11 to 8:20	9%
8:21 to 8:30	7%
8:31 to 8:40	9%
8:41 to 8:50	19%
8:51 to 9:00	10%
9:01 to 9:10	6%

The table helps illuminate some of the reason behind a previously discussed metric, “routes per bus.” Roughly 40 percent of buses are dropping off students in the 7:40 to 8:10 timeframe. These buses are then free to complete another route in the 8:40 to 9:10 timeframe. The industry refers to the peak drop-off and pickup periods as “tiers.” A loosely defined two tier structure can be seen in the CBE routing architecture using these two timeframes. It is loosely defined because they represent 30 minute windows, and 25 percent of routes do not fit within them.

The distribution of active route time is depicted in the figure below. This graphical representation presents on the vertical axis the number of school buses actively in use transporting students at each of the time intervals indicated on the horizontal axis.



where some of the buses are only able to perform on route in either the morning or afternoon time panel.

## Conclusions and Recommendations: Routing Analysis

1. The transportation system is planned to operate effectively given its constraints. The summary of the routing efficiency analysis is very much dependent on other aspects of the CBE, some mentioned within other sections of this report. Routes are designed to fit two large time windows during each peak period, however not all routes fit this criteria as bell times vary across CBE schools. Bell times and programmatic offerings pose the largest constraint affecting the efficiency of routes at this time. Bell times currently do not align in a way conducive to efficient transportation periods. Programmatic offerings and the eligibility of students to receive busing to these programs, often creates long routes with few riders. Essentially, many routes must traverse a wide geographic area to serve a relatively small number of students enrolled in a program.
2. Routes utilize most of the available seating on a system-wide average. To expand on this finding it must be understood that the average includes a large sample. In the analysis, 656 routes were included and resulted in a capacity utilization of 81 percent using a two-per seat factor. Using a three-per seat factor, this number is much lower at 54 percent. While the average shows strong utilization, the large sample includes many routes that are less than half full.

Instead of focusing on the system-wide average, route planners and analysts should focus on the nearly 200 routes that have fewer than 30 students riding. With large transportation operations, the chart displayed in **Figure 6** is typically more evenly balanced. The CBE example has a significant portion of routes on the low end of ridership. This is the direct result of the number of students that are transported outside of the attendance zone due to either programs of choice or overcrowding and should not be considered a reflection of bad scheduling or planning.

Many of these routes are serving specialized programs for which students are eligible for transportation. These students may live in different areas, which would create planning difficulties. Providing access to these programs is a positive for the educational experience, and the dilemmas they cause for the logistics of transporting students should be considered. These considerations may not be a responsibility of a route scheduler or planner, but rather administrative decision makers who plan the times, locations, and eligibility of students.

3. Bus route and ride times are acceptable per policy and service goals. Very few students are riding the bus for more than 40 minutes. This finding generally lends itself to a service that is higher in quality. Students riding the bus for short amounts of time is ideal. Given previous findings and performance metric values however, the math does not completely add up.

For example, almost 75 percent of routes are less than 40 minutes in length. With the peak times for start of day being conveniently one hour apart, one would believe that 75 percent of these routes could be “doubled.” However, at present only about half of the routes are paired to drive two different routes during a shift. This creates an opportunity for efficiency, likely in two different ways. First, routes can be further analyzed with a more sophisticated mapping or route management software process. Second, bell times could be evaluated with the explicit goal of creating efficiencies in the transportation network.

5. Route schedulers are not well equipped to utilize all existing information for their route planning processes. Presently the database of contract owning students and the routing software database are not connected. There is no regularly occurring update to student information for the purposes of route scheduling and designing. The process involved in routing students is not automated in any way. With regular exchange of information between the student database and the route database, students can be automatically assigned to an established stop and an established route.

At the time of this report, the CBE is in a transition period between route planning software vendors. This finding is directly relevant to the implementation process. CBE should identify a way to incorporate the transportation database, or a similar student database with reliable and regularly updated information, into the daily upkeep of routes. The integration of the student database and the routing software is a key requirement as students are constantly moving, registering, and changing programs requiring daily monitoring and management of the routing network.

## Financial Analysis

A review of fiscal year 2014-15 expenditure data was performed to assess the cost effectiveness of each service type. This process included the review of all transportation related expenditures such as labor and benefit costs for CBE central transportation staff, building based school aides, contracted service expenditures, and the cost transportation related software and technology support. CBE staff provided insight into the contents of each line item to ensure that expenditures could be properly identified and allocated. Additionally, given the focus on home-to-school service costs, expenditures such as extracurricular or athletic trip costs were excluded from the analysis. From this cost basis, a detailed assessment of financial efficiency could be performed.

### Results – Financial Performance

#### Cost Analysis

*Key Observation: While the cost of regular education transportation appears reasonable, overall costs are influenced by higher costs for students with exceptional needs and alternative education students.*

The cost allocation methodology provides an understanding of key financial performance measures including the annual cost per bus, route, and run, and for regular education and students with exceptional needs. These metrics serve as a useful point of comparison of performance against various industry standards and guidelines, and against peer organizations for which SBC has followed an identical methodology. The detailed cost analysis is included as *Appendix 1* to this report.

For the fiscal year 2014-15, the cost of transportation was calculated to be \$11,068,941 for regular education service, \$14,461,678 for students with exceptional needs, \$18,054,196 for students attending alternative programs, and \$1,645,172 for Calgary Transit rebates and waivers for a total annual cost of \$45,229,988. The annual cost per bus for all types of transportation was calculated to be \$54,345 with the average annual cost per student of \$1,534.

Further analysis finds an annual cost per regular education student of approximately \$819 and approximately \$7,611 for students with exceptional needs. It should be noted that it is typical for the cost of students with exceptional needs to range from five to ten times higher than the cost for regular education students. The annual cost per student for regular education and the higher than expected cost for alternative program students is the direct result of having to transport students out of their assigned school zone either due to program location or overcrowding.

Another key indicator of overall transportation performance is the cost of transportation as a percentage of the total general fund operating budget. Based on transportation expenditures of \$45,229,988 and an FY 2014/15 General Fund budget of \$1,246,153,000, transportation costs are approximately 3.6 percent of the total budget compared to an expected range of 4 to 6 percent.

These and other cost metrics are summarized in the following table:

**Table 10: Cost Related Performance Metrics**

Cost Measure	CBE
Annual Cost per Bus	\$54,345
Daily Cost per Bus	\$295
Daily Cost per Run	\$224
Annual Cost per Student (rider count)	\$1,534
Annual Cost per Reg. Ed Students	\$819
Annual cost per Students with Exceptional Needs	\$7,611
Annual Cost per Alternative Program Students	\$1,388
Percentage of Total Cost of Transportation to the 2014-15 General Operating Fund Budget	3.6%
Note: The annual cost per bus and student varies greatly between student transportation organizations due to regional differences in wages, health care, and other benefits such as retirement.	

Based on an annual cost per bus of \$54,345, it appears that the cost of service is reasonable. While the cost of students with exceptional needs is approximately \$7,611, this metric also appears reasonable and is within the expected range.

#### The Impact of Transportation Fees, Rebates, and Waivers

To maintain the funding level necessary to support a high quality educational program, the CBE has made the following commitments in regards to the subsidizing of fee programs in all areas including transportation services:

- To keep fees for service as low as possible, the CBE has committed to being as efficient as possible in the delivery of services.
- The CBE has determined it will not subsidize fee programs with instructional funds. The result of this is that all the costs of providing transportation are funded by a combination of targeted provincial grants, reserves (where available) and parent fees. Costs of providing the services include direct labour and supplies, as well as the cost of fee waivers and uncollectible accounts.

The CBE has established a fee of \$300 for all students taking a yellow school bus. Based on information provided by the CBE, overall transportation fees are comparable to the fees charged by the other Metro Boards. However, the one key difference is the fee that is charged for programs of choice by the Edmonton Public School Board. As illustrated in the following **Table 11**, the CBE maintains a fee of \$300 for all service types for students accessing yellow school buses while the Edmonton Board charges a fee of \$550 for program of choice transportation.



Table 11: Metro Board - Fee Comparison

Fees by Board and Type of Service	CBE	Calgary Catholic	Edmonton Public	Edmonton Catholic
Elementary (K-6)	\$300	\$270	\$300	K=\$0; 1-6 = \$320
Middle (4-9)	\$300	Transit	n/a	4-6 = \$320; 7-9 = \$500
Junior (7-9)	\$300	Transit	n/a	500
High (10-12)	Transit	Transit	n/a	500
Program of Choice	\$300	Transit	\$550	1-6 = \$320; 7-9 = \$500
Family Maximum Fee		\$540	n/a	\$40/student discount (3+ students)

Based on approximately 12,460 program of choice or alternative program students transported, if the CBE were to consider raising the rate to be comparable to the Edmonton rate, an additional \$3,115,000 in off-setting revenue would be possible.

**Waivers and Rebates:** Administrative Regulation 6095, Section 6 – Regulation Statement – 2 states the following: “Independent students and parents of a student who are experiencing financial difficulties may apply to the Chief Financial Officer or designate for a waiver of transportation fees”. The process for the granting of waivers is guided by two documents that seek to clearly define the circumstances under which a waiver may be granted. The document titled “Should I apply for a waiver?” describes the criteria for qualification that includes using the Alberta Child Health Benefit income guidelines based on family size and for family’s that fall into certain recognized groups such as government sponsored convention refugees, and those with treaty status who are low income. The document further states *“that If you do not qualify for a waiver but fees present a significant financial hardship for your family, we encourage you to meet with your school principal. Principals have discretion to waive fees in appropriate circumstances. No student will be denied access to education due to an inability to pay”*. The Fee Waiver Application form is to be submitted for consideration before any waiver can be officially granted.

According to the provided financial data, of the total expense of \$1,645,172 reported for Calgary Transit Waivers and Rebates for 2014-15, \$673,740 was for transit waiver passes while the remainder of \$971,432 was the rebate offered to parents against the full cost of the transit passes. Based on the fact that only 60 percent of parents actually requested the rebate and the cost of processing, the CBE is no longer offering the rebate for transit passes. In addition to the expense for transit waivers and rebates, an additional expense of \$1,332,870 is due to the waiver and uncollected fees for “yellow” bus transportation. Of this amount approximately \$438,900 was attributed to uncollected fees while \$893,970 was expensed for the cost of waivers for “yellow bus” transportation.

Combined, the total expense for transit and yellow bus waivers and for uncollectable debt is approximately \$2,006,610 which accounts for 4.4 percent of the total cost of providing transportation.

#### The Impact of the Current Funding Formula

*Key Observation: It is clear that CBE transportation will continue to be provided at a deficit absent the*

*increase in provincial funding, student fees, increased routing efficiency, and/or a decrease in service.*

The Province of Alberta provides funding to support the transportation of eligible students in Kindergarten to Grade 12. Eligibility is defined as students that live farther than 2.4 kilometres from their assigned school. Transportation funding is provided to school boards according to the following four formulas:

**Metro urban transportation:** The four metro school boards (Calgary Catholic School District, Calgary Board of Education, Edmonton Catholic Schools and Edmonton Public Schools) receive \$549 per passenger.

**Rural transportation, population under 10,000:** Rural school boards receive transportation funding based on a formula that takes into account student population density and the distances students travel.

**Urban transportation, population is 10,000 or more:** Per passenger: \$507 in smaller centers to \$466 per passenger in larger centers Rates per km range from \$10.58 to \$31.45 depending on distance passenger travels

**Students with Exceptional Needs:** Boards also receive funding to transport students whose special needs require specialized transportation. For 2014-15 this funding was \$3,374 for school boards serving urban and metro areas and \$6,748 for school boards serving rural areas.

Based on the previous analyses, it is readily apparent that the CBE is funded well below the actual cost to provide transportation services. It is also apparent that the Board's efforts to lobby for an increase in provincial funding is well justified.

## Conclusions and Recommendations: Financial Performance

As determined by the analyses of expenditures and illustrated in **Table 10**, the cost per student is approximately \$1,534 for all students while the CBE receives provincial funding of \$549 and a fee of \$300 for a total of \$849. While the transportation fee provides for an offset of these costs, it is clear that CBE transportation will continue to operate at a deficit absent the increase in provincial funding, student fees, increased routing efficiency, and/or a decrease in service. To help achieve a potential reduction in the cost of providing transportation services, the CBE should consider the following recommendations:

1. While an increase in the fee for service is likely to meet with resistance, it is within the control of CBE and the rationale can be clearly illustrated.
2. The processes for the waiver of fees must continue to ensure that only families that meet clear financial guidelines are granted waivers and that Principal waivers should be granted based on well-defined criteria ensuring equal and equitable application across the system.
3. Support the recommendation for an increase in departmental staff and especially in the area of route planning. As discussed above, for every bus that is removed from service due to improved route planning, an average of \$52,700 could be saved. For this potential to be realized, route planning software must be fully implemented and investment in training be supported. Given the size and complexity of the operation, it would be fully expected that the return on investment i.e. a reduction in the number of buses, would far exceed the cost of additional employees and training.

## Contract Management

As described in the *Staffing Assessment* section, regardless of the size of a pupil transportation operation and whether it is self-operated or outsourced, there are four key functional requirements that must be staffed and managed appropriately. In a large and complex organization such as the CBE transportation operation where functional requirements and responsibilities are divided between CBE staff and contracted services, it is imperative that contracts for service are well thought out to support cost effective and service efficient operations. Critical elements of a contract for service that supports effective and efficient service delivery include:

- Roles, responsibilities, and all operational requirements are clearly defined for both the district and the contracted service provider.
- Contractual clauses that clearly establish the compensation for services provided including penalties for non-performance and the potential for incentives when expected service levels are exceeded.
- Fleet standards such as vehicle type, equipment, and age limits are well defined.
- Data sharing and reporting requirements are clearly defined to support the measurement of key performance indicators.
- Employee standards are clearly established to meet or exceed both provincial and CBE regulations and requirements.

While the following will briefly discuss the current “Yearly Service Agreement”, this review will focus on the Student Transportation Services – Request for Proposal (RFP) that may be released after the completion the transportation study and guiding improvement plan.

### Results – Contract Management

**Current Contract:** Contracted services are currently being delivered under the Master Transportation Agreement that became effective September 1, 2006. On an annual basis, a Yearly Service Agreement (YSA) is signed between the CBE and the carriers. This agreement describes four key areas that are considered as part of the YSA including:

- Exhibit #1: Driver and Personnel Requirements – Key requirements include:
  - A ten year driving abstract that is acceptable to the CBE
  - Background screening and other reasonable checks as permitted by the Alberta Human Rights and Citizenship Commission.
  - Each driver holds and maintains a valid Alberta operator’s license.
  - Establishes a minimum daily base rate for drivers.
- Exhibit # 2: Payments and Charges – Key elements include:
  - Establishes the annual rate per route.
  - Defines the daily base as a maximum of three hours with payment being calculated on the “live running time” i.e. only for the time that the bus is carrying students.

- Daily fuel cost calculation (Fuel clause reviewed in greater detail below).
- Exhibit #3: Bus Routes – Bus routes under the responsibility of the carrier.
- Exhibit #4: Performance Indicators – Measured key performance indicators include:
  - On-time performance – points awarded or deducted based on the following schedule:
    - 0-.02% late = + 8 points
    - 03-.04% late = + 4 points
    - 0.5-.06% late = 0 points
    - 07-.08% late = - 4 points
    - 0.9-1.0% late = - 8 points
    - 0-.02% late = + 8 points
  - Efficiency – One point will be award per occasion that the carrier identifies scheduling changes that help to reduce the number of buses required.
  - Safety – Ten points awarded for participation in the First Ride Program and for “value added” safety initiatives.

A key element of the current Master Agreement is found in Article 8 – Audits. This article clearly defines the right of the CBE to review and audit the following:

- Carrier records and supporting documents to ensure that the terms of the Master Agreement and YSA are being met or exceeded.
- The inspection of the facilities of the carrier.
- Employment records of personnel providing service the Board.
- Audits by CBE staff will not occur more than once annually.

As a result of the current contract being in effect since 2006, the CBE has drafted a new RFP that may be released pending the review of this study and other initiatives within the district. The following section details our assessment of the draft RFP and how it might be enhanced to further support effective and efficient service.

**Draft RFP:** Key points within the RFP are illustrated in **Tables 12 and 13**. It should be noted that prime focus of this review is to highlight clauses or sections where the current contract language may have a negative impact on costs or service or conversely terms or conditions that support a more effective and efficient operation.

Table 12: RFP Review

Student Transportation – Request for Proposal		
Section Reviewed	Summary of Section Language	Potential concerns, omissions, and impact on costs <i>or</i> a term or condition that in particular supports a more effective and efficient operation
1.0 Introduction	<ul style="list-style-type: none"> <li>• Introduction including the size and scope of CBE operation and describes the purpose of the RFP.</li> <li>• Establishes that a contract may be awarded to one or more bidders</li> </ul>	<ul style="list-style-type: none"> <li>• None noted</li> </ul>
2.0 RFP Terms and Conditions	<ul style="list-style-type: none"> <li>• Bidders are responsible for understanding and complying with all requirements in the RFP.</li> <li>• RFP terms are defined.</li> <li>• "Innovative Proposals" are encouraged.</li> <li>• All questions must be forwarded to the CBE Buyer. Answers will be posted on the Alberta Purchasing Connection website ensuring that all bidders have access to the same information.</li> <li>• Evaluation criteria is established based on the following:               <ul style="list-style-type: none"> <li>○ Customer Service (40%)</li> <li>○ Pricing (20%)</li> <li>○ Suitability/Experience/Qualifications (30%)</li> <li>○ References (10%)</li> </ul> </li> <li>• Consortium Proposal</li> <li>• Best and Final Offer</li> </ul>	<ul style="list-style-type: none"> <li>• None noted</li> <li>• Proposal must first meet the requirements of the RFP. Potential exists for the presentation of innovative service delivery that may result in cost of service improvements.</li> <li>• Provides an indication that a high level of customer service is a prime consideration.</li> <li>• Potential exists for the presentation of innovative service delivery that may result in cost of service improvements.</li> <li>• A best and final offer process serves the CBE by providing a choice between the top bidders.</li> </ul>

Student Transportation – Request for Proposal		
Section Reviewed	Summary of Section Language	Potential concerns, omissions, and impact on costs <i>or</i> a term or condition that in particular supports a more effective and efficient operation
3.0 The Agreement	<ul style="list-style-type: none"> <li>Form of Agreement attached as Schedule B.</li> <li>Manufacturer of Brands</li> <li>Initial Term – 10 years with 1 (One) – 5 (Five) year optional extension.</li> </ul>	<ul style="list-style-type: none"> <li>Further reduces any misconception of the scope of services.</li> <li>CBE holds the final approval of manufacturer of brands. This helps to ensure that equipment that is compatible with technology already owned and operated by the CBE i.e. Zonar and Z Pass.</li> <li>While a longer term reduces the risk of the bidder, a comprehensive performance measurement and contract management program must be administered to ensure that compliancy does not erode service levels over a period of time.</li> </ul>
4.0 Proposal Terms	<ul style="list-style-type: none"> <li>Miscellaneous terms used throughout the proposal are defined.</li> <li>A minimum of four references are required for each of bidders.</li> </ul>	<ul style="list-style-type: none"> <li>None noted.</li> </ul>
5.0 CBE Discretion	<ul style="list-style-type: none"> <li>The CBE has the right to accept or reject any and all proposals.</li> </ul>	<ul style="list-style-type: none"> <li>Ensures that only proposals that are in the best interest of the CBE are considered.</li> </ul>
6.0 Limits of Liability	<ul style="list-style-type: none"> <li>Limits claims against the CBE as a result of the bidders participation in the RFP process</li> </ul>	<ul style="list-style-type: none"> <li>None noted.</li> </ul>
Schedule A: Project Scope	<ul style="list-style-type: none"> <li>Defines the scope of home-to-service transportation services.</li> <li>Describes the point-based key performance indicator system.</li> <li>Describes how the point system influences the number of routes that will be awarded throughout the term of the contract.</li> </ul>	<ul style="list-style-type: none"> <li>Consider adding a reference to CBE policies and regulations to enhance understanding of service requirements.</li> </ul>

Table 13: Form of Agreement Review

Schedule "B" Form of Agreement		
Section Reviewed	Summary of Section Language	Potential concerns, omissions, and impact on costs or a term or condition that in particular supports a more effective and efficient operation
NOTE: Section numbers remain in sequence to the RFP sections		
7.0 Interpretation	<ul style="list-style-type: none"> <li>• Definition of the terms used in the Agreement.</li> <li>• In the event of conflict between a Schedule of the Agreement, the Annual Service Agreement, or the body of the Agreement, the body of the Agreement shall take precedence over a Schedule and the Annual Service Agreement and a Schedule shall take precedence over an Annual Service Agreement.</li> </ul>	<ul style="list-style-type: none"> <li>• Ensures that contractual terms are understood and that ultimately that the body of the agreement and schedules of the agreement take precedence over the Yearly Service Agreement.</li> </ul>
8.0 Transportation Services	<ul style="list-style-type: none"> <li>• Documents that services will be performed to the terms of the Agreement and the Annual Service Agreement.</li> <li>• Establishes that the carrier is responsible for the maintaining all authorizations, licenses, and permits.</li> <li>• The carrier is responsible for providing all buses, drivers, and carrier personnel and other resources necessary to provide the described transportation services.</li> </ul>	<ul style="list-style-type: none"> <li>• Establishes that the CBE has the right at all times to contract directly or through any third party or parties.</li> </ul>

Schedule "B" Form of Agreement		
Section Reviewed	Summary of Section Language	Potential concerns, omissions, and impact on costs <i>or</i> a term or condition that in particular supports a more effective and efficient operation
9.0 Obligation of the Parties	<ul style="list-style-type: none"> <li>Describes the general nature of home-to-school services for the CBE.</li> <li>Defines responsibilities for communication during inclement weather conditions.</li> <li>Establishes the necessity for monthly meetings to include the discussion of the monthly review of performance indicators.</li> <li>Establishes that the number of routes may be increased or reduced depending on the carrier's performance.</li> </ul>	<ul style="list-style-type: none"> <li>Carrier responsibilities are clearly defined in regards to meeting performance standards and reporting. These requirements are a best practice that helps to ensure that services are delivered to meet or exceed contractual specifications.</li> </ul>
10.0 Fees, Rates, and Payments	<ul style="list-style-type: none"> <li>Establishes the process for the payment of services.</li> <li>Fuel costs information will be provided by the Carrier to CBE on the first (1st) Business Day of each month of the Term based on the price of fuel on the first (1st) day of that month. Any adjustment to fuel costs based on such fuel price shall be deemed to be consented to by both parties. CBE shall have the right from time to time to request from the Carrier details concerning its fuel consumption hereunder.</li> </ul>	<ul style="list-style-type: none"> <li>None noted.</li> </ul>
11.0 Term	<ul style="list-style-type: none"> <li>Establishes a ten (10) year term.</li> </ul>	<ul style="list-style-type: none"> <li>As discussed in the RFP section; While a longer term reduces the risks for the bidder which may result in lower rates as the cost of capital investments is spread out over a longer term, success requires a comprehensive performance measurement and contract management program to ensure that compliancy does not erode service levels over the term of the contract.</li> </ul>



Schedule "B" Form of Agreement		
Section Reviewed	Summary of Section Language	Potential concerns, omissions, and impact on costs <i>or</i> a term or condition that in particular supports a more effective and efficient operation
12.0 Confidentiality	<ul style="list-style-type: none"> <li>All information provided by the CBE remains the sole and exclusive property of the Board.</li> <li>The carrier agrees to the confidentiality standards and requirements of the CBE.</li> <li></li> </ul>	<ul style="list-style-type: none"> <li>None noted.</li> </ul>
13.0 Indemnification, Limitation of Liability, and Insurance.	<ul style="list-style-type: none"> <li>Establishes that the carrier will indemnify the CBE against any and all losses.</li> <li>Documents the insurance standards that must be met throughout the term of the agreement.</li> </ul>	<ul style="list-style-type: none"> <li>None noted.</li> </ul>
14.0 Force Majeure Events	<ul style="list-style-type: none"> <li>Limits the liability of the parties in the event of failure or delay beyond a party's reasonable control.</li> </ul>	<ul style="list-style-type: none"> <li>None noted.</li> </ul>

## Conclusions and Recommendations: Contract Management

While overall the draft RFP and Form of Contract mirror the current Master Agreement and Yearly Service Agreement, several key areas which are likely the result of unintended omissions have been identified. These omissions include:

1. A key element of the current Master Agreement that is found in Article 8 – Audits. This article clearly defines the right of the CBE to review and audit the following:
  - v. Carrier records and supporting documents to ensure that the terms of the Master Agreement and YSA are being met or exceeded.
  - vi. The inspection of the facilities of the carrier.
  - vii. Employment records of personnel providing service the Board.
  - viii. Audits by CBE staff will not occur more than once annually.

This article should be reexamined and inserted into the RFP and Form of Contract. It is also recommended that the CBE reserves the right to conduct audits at any time during the course of year where in the Board's judgment, that performance or safety related issues warrant and auditing of the carrier.

2. Fleet age maximums or the average age of the fleet is not discussed or described within either



the draft RFP, Form of Agreement, of the Yearly Service Agreements. The establish of fleet standards is important for multiple reasons including:

- i. Newer buses have the benefit of improved safety and emissions equipment compared to older vehicles.
- ii. Newer vehicles generally are more reliable resulting in less down time due to mechanical failure and maintenance.
- iii. Newer vehicles generally provide a greater level of student comfort due to advances in seating, and heating and air conditioning systems.

## General Discussion –Alternative Service Delivery Models

Throughout Canada, school boards have or are considering alternative models of service delivery for pupil transportation. While increasing costs have been the impetus for this change, alternative service delivery models such as consortia or consolidated services have gained recognition as a methodology to reduce the redundancies that exists within any local area. Alternative service delivery models have shown that transportation services can be provided in a manner that achieves cost and other operational benefits without diminishing the level of service for any of the participating entities.

One of the leaders in the industry has been the Province of Ontario through its Ministry of Education (MOE). In an excerpt from the MOE's website, transportation reforms were found to have provided the following benefits:

- The establishment of consortia that have increased management capacity and the efficiency of operations.
- The Ministry is validating the efforts made by boards towards this goal by conducting Effectiveness and Efficiency (E&E) reviews on consortia to ensure that boards are implementing and adopting best practices in governance, policies and practices, use of routing software, and contracting.
- Reforms have resulted in better contract and performance management with increased transparency in the use of public funds
- Consortia have made greater use of technology in the areas of both software and staff training, achieving efficiencies and optimizing solutions while maintaining service levels to students.
- Consortia have worked cooperatively with the Ministry to build greater capacity to realize efficiencies. As a result, an increasing number of boards are *reducing their transportation deficits*.

It is apparent that the CBE is highly motivated to examine and implement improvements within its transportation operation while maintaining a high level of service. The overall goal is to reduce any deficit and the potential of impacting funding that ideally should be invested in direct educational support for its students. Concurrent with the start of this evaluation, the CBE met with senior managers of Calgary Transit to explore mutual opportunities for collaboration. This could range from increasing routes served by CTS up to the consideration of entering into a service provider agreement. Under a service provider agreement with Calgary Transit, all operational aspects of providing student transportation could be under the auspices of Calgary Transit.

While the discussions with Calgary Transit (CT) are in the preliminary stages and SBC has not been specifically tasked with assisting with a cost benefit/analysis, SBC was provided an opportunity to accompany CBE representatives and staff in several of the initial meetings with CT managers. During the course of these preliminary meetings, SBC was afforded the opportunity to fully participate in the discussions and was able to ask a number of questions to gain an understanding of the viability of a service provider agreement between the CBE and CT. Based on the discussions and information provided, our initial impressions are as follows:

- CT has expressed that they have a high level of understanding of the unique requirements of K-12 pupil transportation. This is in part due to providing service to secondary students but most importantly due to the fact that this concept was previously piloted in 1996. While the pilot was considered to be a success, no formal service provider agreement was signed nor was there any remuneration provided to Calgary Transit

for managing the service.

- CT has embraced the use of technology throughout its organization and could transfer the benefits of their systems and their expertise in its use to ensure that K-12 transportation is operated in a manner that is both effective and efficient.
- The CT organization is of the size that it employs specialists in each key management and operational areas of effective transportation operations. Examples include communications and media specialists, route planners, data analysts, technical support staff, and staff with expertise in strategic planning.
- CT expressed full understanding of the specific needs of the CBE with the concern for student safety at stop locations and while in transit being the most notable.
- CT views this form of collaboration as a great benefit to the City of Calgary as a whole and expressed these key points:
  - Collaboration would provide the best value and service to the community, further stating that it is “the right thing to do”.
  - That the CBE and CT share common values in trying to provide the best service possible to the customers they serve.
  - Collaboration would ensure greater sustainability for both organizations and would be mutually beneficial.

### Conclusions and Recommendations: Alternative Service Delivery Models

While it again appears that discussions with Calgary Transit are in the informal and preliminary stage, SBC’s initial impression is that additional collaboration including the entering into a service provider agreement warrants further analyses, discussion, and consideration. These discussions should include:

- Cost and service benefits can only be determined after a comprehensive analysis of the service model and rate structure to ensure that service standards can be maintained or enhanced and that cost savings are truly achievable.
- A contract for service would need to clearly establish that services can and will be provided in a manner that fully aligns to CBE educational goals and safety standards.
- Methodologies would need to be designed to ensure enforcement of CBE policies and regulations.
- As the accountability for the service would remain with the CBE, a number of CBE transportation staff would need to be retained. Positions would include specialists in the area of contract management, performance analysis, and reporting.



# School Bus Consultants

## Appendices

### Appendix 1: Cost Model

Calgary Board of Education Transportation Cost Allocation Based on FY2014-15 Expenditures			Allocation Statistics			Regular Ed	Exceptional Needs	Other- Alternative Program
			Students	100.00%		47.54%	6.69%	45.77%
			Buses	100.00%		25.69%	32.42%	41.90%
			Runs	57.01%		32.39%	24.62%	
			Buses Reg and Alternative	100.00%		38.01%		61.99%
			Buses Reg and Alternative	100.00%		50.94%		49.06%
Actual Expenditures			Adjustments	Allocated Total	Allocation Type	Regular Ed	Exceptional Needs	Other- Alternative Program
Account	Description	Comment	2014-2015					
	Rebates and Waivers	Calgary Transit	\$ 1,645,172	\$ (1,645,172.00)	\$ -	\$ -	\$ -	\$ -
	Taxis	Special Education	\$ 837,326		\$ 837,326	Direct-Sped	\$ -	\$ 837,326.00
	Handi-Bus	Special Education	\$ 11,610		\$ 11,610	Direct-Sped	\$ -	\$ 11,610.00
	Special Ed Charter	Special Education	\$ 10,390,622		\$ 10,390,622	Direct-Sped	\$ -	\$ 10,390,622.24
	Special Ed Bus Attendants & LPN's	Special Education	\$ 1,857,892		\$ 1,857,892	Direct-Sped	\$ -	\$ 1,857,892.02
	Kindergarten	Charter Service	\$ 1,778,545		\$ 1,778,545	BUSES	\$ 675,978.38	\$ -
	Regular	Charter Service	\$ 24,500,702		\$ 24,500,702	BUSES	\$ 9,312,074.95	\$ -
	Other Transportation Services		\$ 396,578		\$ 396,578	BUSES	\$ 101,864.17	\$ 128,566.43
	Bad Debts & Waivers		\$ 1,332,870		\$ 1,332,870	BUSES	\$ 342,358.13	\$ 432,102.49
	Central Administration		\$ 1,125,302		\$ 1,125,302	BUSES	\$ 289,042.55	\$ 364,810.99
	School Aides		\$ 1,353,369		\$ 1,353,369	BUSES	\$ 347,623.54	\$ 438,748.16
<b>TOTALS</b>			\$ 45,229,988	\$ (1,645,172)	\$ 43,584,816		\$ 11,068,941.72	\$ 14,461,678.34
			\$ 1,246,153,000.00					
Description	Expenditures	Percentage of Tot						
Transit Rebates	\$ 971,432	2.1%	3.6%					
Transit Waivers	\$ 673,740	1.5%	3.6%	<b>Unit Totals</b>				
Taxis	\$ 837,326	1.9%	37%	<b>TOTAL</b>				
Handi-Bus	\$ 11,610	0.0%		Home-to-School Transportation				
Special Ed Charter	\$ 10,390,622	23.0%		Transp. Students				
Special Ed Bus Attendants & LPN's	\$ 1,857,892	4.1%		Total Buses				
Kindergarten	\$ 1,778,545	3.9%		Bus Runs				
Regular	\$ 24,500,702	54.2%		<b>Unit Costs</b>				
Other Transportation Services	\$ 396,578	0.9%		Home-to-School Transportation				
Yellow Bus Bad Debts	\$ 438,900	1.0%		Regular Ed				
Yellow Bus Waivers	\$ 893,970	2.0%		Exceptional Needs				
Central Administration	\$ 1,125,302	2.5%		Other- Alternative Program				
School Aides	\$ 1,353,369	3.0%		Cost per Student				
Total Transportation	\$ 45,229,988	100.0%		\$1,534.68				
Total Waivers and Bad Debt	\$ 2,006,610	4.4%		\$819.92				
				\$7,611.41				
Total CBE General Operating Exp	\$ 1,246,153,000.00			\$53,732.73				
Cost of Transportation as a Percentage of Total CBE Expenditures		3.6%		\$55,621.84				
				\$292.03				
				\$224.31				
				\$179.81				
				\$309.01				
				\$220.93				
				30 Bus Reduction				
				\$ 1,630,354.72				
				50 bus Addition				
				\$ 2,717,257.87				

Appendix 2: Ontario Common Practice Examples

Ontario Common Practice Examples			
Parameter	JK/SK	Gr. 1-8	Gr. 9-12
Home to School Distance	0.8 km	1.2 km	3.2 km
Home to Bus Stop Distance	0.5 km	0.8 km	0.8 km
Arrival Window (minutes)	18	18	25
Departure Window (minutes)	16	16	18
Number of Students Per Seat	3	3	2



### Appendix 3: Qualitative Staff Skills Assessment

As noted in the *Staff Skills Assessment* section: Due to the fact that this evaluation is directly related to individuals within the department and that the results may become part of an individual's private employment file, the information referred to as *Appendix 3* will only be available to the appropriate CBE managers and administrators.