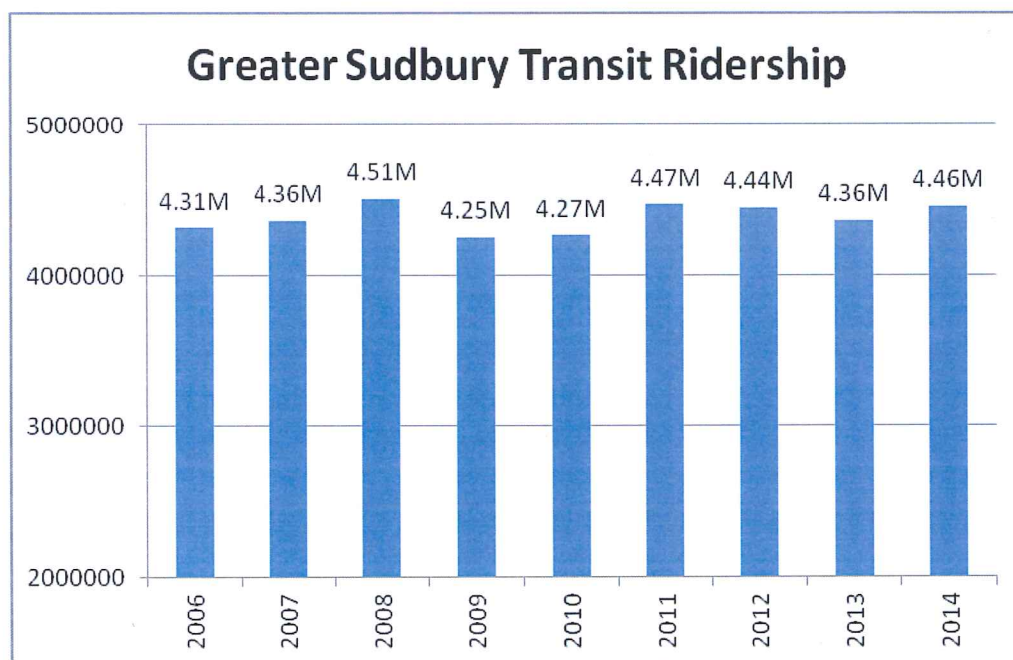


Background

Greater Sudbury Transit's aim is to deliver quality, affordable, accessible transit services that link people, jobs and communities. Greater Sudbury Transit's conventional service provides fixed routes between urban and commuter areas. This service is supplemented with a Trans Cab Service to provide door to door service for passengers in areas of reduced travel demand. Greater Sudbury Transit also offers specialized transit services to persons who have physical disabilities and are unable to use the conventional transit system. Appendix A depicts the area serviced by Greater Sudbury Transit's Conventional, Specialized and Trans-Cab services.

In 2006, Transit staff along with consultants from Entra consulting and the Gooderham Group presented a Ridership Growth Strategy and an Asset Management plan to Council. Further to the presentation, Council reviewed and approved in principle several strategies and initiatives to increase transit ridership. Within these strategies, service standards were introduced. Service standards provide a framework for staff to monitor and analyze data collected from the fare collection and AVL systems.



Ridership levels in the last few years have stabilized. A full assessment of the conventional transit system is required to identify improvements which can be made to the service, which may in turn increase ridership. In order to do so, and continue to meet Greater Sudbury Transit's aim, a systematic approach must be taken.

Purpose

This report will give an overview to the Operations Committee of Greater Transit's Service Design Standards, Key Performance Indicators and reporting/monitoring service review process. These tools will be the foundation for staff to perform a systematic assessment on past and current performance of routes and provide a framework to assess requests for new, modified or extended services.

Service Design Standards

Service design standards guide the design of a transit network by ensuring availability and reliability of service, convenience, and comfort to passengers. They are an important tool in assessing and monitoring the financial and operating performance of the system and individual routes.

Service design standards define the minimum amount of service provided during an entire day regardless of the level of ridership. This is known as "Base service" and is expressed in terms of coverage, hours of service, and frequency of service. Greater Sudbury Transit's base hours of service are from 7 a.m. until 10 p.m, and the frequency of service is provided at minimum intervals of 60 minutes in urban areas, and 9 trips per service day for Commuter areas.

"Customer-based service" is the amount of service provided above the base service where ridership is sufficiently higher to warrant and support additional service. This enhanced service is provided through higher frequencies, where the return on investment is significantly higher than the return achieved in the base service.

Greater Sudbury Transit's current system as a whole consists of 57% base service, and 43% customer base service. The following is a breakdown by Service Day.

Service Day	Base Service	Customer Base Service
Weekday	53%	46%
Saturday	64%	37%
Sunday	83%	23%

The standards in Table 1 were approved in principle by Council in 2006 and are consistent with industry standards. Several amendments have been made to ensure current industry standards are being met. The standards are applied when monitoring and measuring system efficiencies within the Greater Sudbury Transit's System, and for assessment of new service requests from the general public. When performing a complete system review, these standards will be reviewed against the actual service provided.

Table 1: Service Design Standards

Standard	Description	Status and Next Steps
Service area	The Sudbury Transit system serves urbanized areas of Greater Sudbury, including the urban commuter areas, subject to the provisions of the approved service design standards. There are separate standards for Urban and Commuter routes.	Compliant with service standard
Service frequency	Service is provided on urban route base service at a minimum frequency of 60 minutes. Service is provided on Commuter routes with at least 9 trips per service day, comprising three AM peak inbound trips, and three PM peak outbound trips, plus one trip in each direction in the midday and one outbound trip later in the PM.	Compliant with base service standard. Review is required on frequency of customer based trips
Service hours	Base level service on urban routes is generally provided between the hours of 7 a.m. to 10 p.m. Customer-based service is provided outside of the base level service in response to ridership demand. This includes earlier AM trips and after 10 p.m. service. All customer-based service hours are monitored for economic performance and may be adjusted when demand does not meet boarding thresholds. Base level service of Commuter routes include no fewer than 9 trips, with the first AM trip designed to arrive at the Transit Terminal no later than 8 a.m., the last trip designed to leave the Terminal no earlier than 7 p.m. Council approval is required for changes to Base level or customer based service.	Compliant with base service standard. Review is required of service hours on customer based trips to ensure economic performance.
Walking distance	Population served by transit is determined by walking distance to a bus route. Individuals who are within 400 meters of a bus route are considered to be within the service area.	Compliant with service standard.

Stop Spacing	Bus stops are generally placed at interval of 250 metres, unless restricted by reason of safety or areas of high demand. In areas of low density population, bus stop distances are necessarily higher at general intervals of approximately 450 metres.	Standard applied with requests for bus stop installation. Review of stop spacing by route is required where on-time performance is poor.
Shelters	Shelters may be provided pursuant to the Bus Shelter Request Policy in Appendix B, a point based system which is monitored on an ongoing basis.	Existing shelters were grandfathered and are monitored based on the point system. Removal and relocation of these shelters are made in conjunction with capital projects.
Fare Structure	Fare structure offers economic incentive for use through discounted fares with tickets and passes. Approved fare structures are reviewed annually. Adequate lead-time is provided to the public in advance of introducing fare increases.	Fares reviewed annually through user fee by-law.
System Equipment	Low Floor accessible transportation shall be provided, and all vehicles will be equipped with next stop announcement system. Vehicles are required to have 25% Canadian Content.	Compliant with service standard
Passenger loading standards	The number of buses required for a route may be determined by route loading capacities. Urban routes should not exceed a maximum average load of 150% seating capacity; Commuter routes should not exceed a maximum average load of 130% seating capacity.	Passenger loads consistently exceeding or falling below standard targets may trigger a review of service. Automatic Passenger Counter information will shortly be available to review route passenger loading data accurately.
Schedule adherence	No bus should leave published time points earlier than its designated time of departure. Greater Sudbury Transit will strive to meet a target of 90 percent schedule adherence, where buses should be "on time" within three minutes late of schedule."	Schedule adherence and operator performance monitored in order to meet this standard. Adjustments are being made accordingly.
Recovery Time	Used for the recovery of delays and preparation for the next trip, time is built into a schedule between arrival at the end of a route and departure of next trip. Recover time per trip should be no less than 10%. Routes with recovery times	Standard is monitored on an on-going basis

	less than 10% should be reviewed for service improvement.	
Route Directness	An index ratio should be applied to measure route directness. To determine the ratio, the deviated distance between two points is divided by the direct distance. When reviewing route directness, high deviation ratio should attract new passengers to the route and not only reduce walking distances for a few.	Standard is monitored on an on-going basis
Introduction of new service	New service should be guaranteed for a minimum of 12 months, and the minimum performance threshold (Table 2) for the class of service should be met at the end of the trial period. Within the trial period, monitoring should occur at 3, 6 and 9 months intervals to ensure targets of 25, 50 and 75 percent (respectively) of the final target value are met. If targets are not being met during the interim period, the route should be re-examined to identify potential change to improve its performance.	Standard to be used on a “go forward” basis
Introduction of modified service	Routes introducing service in new operating periods where routes exist, or modify the existing route should be guaranteed for a minimum of 6 months, with interim monitoring will occur at 2 and 4 months. Interim targets are established at 33 and 66 percent respectively. If the service change is substantial, staff may recommend a longer trial period at the introduction stage of the service.	Standard to be used on a “go forward” basis
TransCab	Regular route services should be considered for conversion to TransCab service if the route’s performance consistently falls below 5 boardings per hour. An area serviced by TransCab should be considered for regular route service when the cost of the TransCab contract reaches 85 percent of providing minimum base service level of a fixed route.	TransCab service is monitored on an on-going basis.

Key Performance Indicators

A key performance indicator (KPI) is a tool by which numerical thresholds and targets are set for a system, its routes and services. Applied with service standards, KPIs can be used to evaluate existing services, and identify efficiency gaps in the transit network.

Three KPIs have been selected to monitor and measure economic, ridership and operational performance.

Economic Performance: The Recovery Cost ratio (R/C %) is the ratio of the fare revenue to the total operating cost, and is expressed in percentages. The Greater Sudbury Transit System currently has a system performance of a 40% R/C which is above average compared to other transit agencies of its population size. It is important to note that commuter areas in general have a low R/C ratio compared to higher density areas, which impacts the overall performance of the system. See Appendix C for the 2014 recovery cost ratio for each of the City's 6 Commuter Routes and the 30 Urban Routes. The overall recovery ratio is 25% for the Commuter Routes and 44% for the Urban Routes.

Ridership Performance: Boarding per vehicle hour by class and time of day is measured against a set of thresholds. This measure can be applied to the system as a whole, for individual routes, or even for portions of a route. Individual routes whose performance is below the minimum boarding per vehicle hour shall be reviewed to identify changes that may improve the route's economic performance. Table 2 outlines the recommended target threshold established by Entra Consulting. See Appendix D for 2014 detailed performance results of all routes by time of day based on these targets.

Table 2 – Boarding Counts per Hour Performance Targets by Class and Time of day

Urban	Time of day	Target Threshold
Weekday AM Peak	Start of service to 10:00 a.m.	15-45
Weekday Midday	10:00 a.m. to 2:30 p.m.	13-40
Weekday PM Peak	2:30 p.m. to 6:30 p.m.	15-45
All service day Evenings	6:30 p.m. to end of service	6-18
Saturday	Start of service to 6:30 pm	7-22
Sunday	Start of service to 6:30 pm	7-22
Total Urban		10-30

Commuter	Time of day	Target Threshold
Weekday AM Peak	Start of service to 10:00 a.m.	10-26
Weekday Midday	10:00 a.m. to 2:30 p.m.	6-18
Weekday PM Peak	2:30 p.m. to 6:30 p.m.	10-26
All service day Evenings	6:30 p.m. to end of service	5-9
Saturday	Start of service to 6:30 pm	5-13
Sunday	Start of service to 6:30 pm	5-10
Total Commuter		6-18

Operational Performance: Schedule adherence is monitored with the AVL system. Data for schedule adherence can be collected by time, weekday and route, allowing for detailed monitoring of the system's performance. A recent analysis was performed of schedule adherence revealing that performance was not meeting standards.

Sunday Service was identified as being the least performing service day, triggering a review of all routes to improve operational performance. In 2015, the following were reviewed and adjustments were made to Sunday schedules accordingly:

- Recovery Time Ratio Review: Routes with less than 10% recovery time were identified, confirming that these routes were causing delays at the downtown terminal.
- Route Patterns: Route patterns were reviewed and adjusted in various ways based on the recovery time ratios.
 - Routes with less than 10% recovery were measured against Route Directness Standards. In areas where Route Directness ratios were high and boarding counts were low, patterns were adjusted so that time could be saved, increasing the recovery time ratio.
 - Routes with low recovery ratios but high boarding counts were merged during peak times with routes having an excess of recovery time.
 - Where permitted on routes with an excess of 10% recovery time, service was added to provide better access to a commercial area, thus increasing customer service.
- Schedule Time Tables: Historical data was retrieved on actual drive time values between scheduled time points during peak hours. Time points were adjusted on all routes to match actual averages during peak time.

Schedule adherence is currently being monitored for all days of the week, and adjusted as necessary. Appendix E represents a 2014-2015 comparison of schedule adherence between April and September for all days of the week. Improvements are noted in schedule adherence, especially during Weekdays and Sundays. It is important to note that construction in the downtown core has had a negative impact on schedule adherence and coincided with the adjustments made to the schedules in 2015.

Although we will continue to strive for a 90% schedule adherence, we offer real-time information published to the public through mybus.greatersudbury.ca which alleviates the frustration of waiting for a late bus.

Sudbury Transit Reports

Table 3 gives an overview of the types of data which is currently being reviewed by Sudbury Transit Staff on an ongoing basis. These reports can be used to recognize trends and identify areas where service enhancements should be recommended to ensure the most effective allocation of resources to individual routes, and provide quality Transit Service to Greater Sudbury residents.

Table 3: Sudbury Transit Reports

Report Name	Data Reviewed in Report	Annual	Monthly	On-Going
Service Design Standard Reports				
Service Level Information	Service Span, Number of Trips, Frequency and Vehicle Requirement by Route and Service day	X		
Recovery Ratio	Trip times and Recovery Ratio by Route and Service Day	X		
Boarding Threshold Ratio	Percentage of Trips by Threshold Targets, by Route and Service Day.	X		
Fare and Ridership Data	Report of detailed ridership information, fare distribution and operating data on a year to date basis by Route and Service Day.		X	
Key Performance Indicators				
Key Performance Indicator	Annual Economic, Ridership and Operational Key Performance Indicators for Urban and Commuter Routes	X		
Economic & Ridership Performance Indicator	Monthly Economic Performance Indicator (R/C%) and Boarding per Revenue Hours by Route		X	
Schedule Adherence	Schedule Adherence by Route and Service day.	X	X	X
Additional Reports				
CUTA Reports	Statistics submitted to Canadian Urban Transit Association for publication in an annual Transit Fact Book	X		
Shelter Report	Annual Ridership by Stop collected for the purpose of reviewing the performance of shelters, based on the Bus Shelter Policy.	X		
Ridership Comparison	YTD Ridership by Month measured against Previous Year's Ridership Totals.		X	

Route Level Analysis	A detailed performance review of individual routes should be reviewed based on monitored results from monthly and annual reports. From this analysis, service enhancements should be proposed. If a proposal does not require capital budget and there is sufficient operating budget available, it may be implemented in the next service period. If the proposal has insufficient operating budget for implementation, it will be presented by priority to Council for approval.			X
Service Enhancement Monitoring	New service enhancements will be monitored in compliance with Service Design Standards on "Introduction of new service" and "Introduction of modified service".			X

Conclusion

This report provides an overview to the Operations Committee of Greater Transit's Service Design Standards, Key Performance Indicators and reporting/monitoring service review process. These tools will be the foundation for staff to perform a systematic assessment on past and current performance of routes and provide a framework to assess requests for new, modified or extended services.

Staff will continue to review and identify improvements which can be made to the service, which may in turn increase ridership and will report back to the Operations Committee on a regular basis.