

Chapter 6. System Evaluation

The following analysis provides an overview of the CATS system performance for its fixed-route and DAR services. The analysis is intended to take a high level view of the system characteristics in terms of overall cost effectiveness and cost efficiencies. By looking at key performance measures and considering how the system is performing as compared with previous years and with other similar sized and positioned systems, we are able to assess relative performance. This analysis helps us determine if system productivity is improving over time and/or is within the desired range.

Performance Summary

Data for the analysis is taken from budget worksheets provided by CATS combined with other system level data provided by First Transit and includes combined ridership and costs for non-Medicaid (STOA) and Medicaid riders. Data is shown for the past three years, 2006, 2007 and 2008. Our analysis attempts to look at performance for fixed-route and DAR services separately. However, while the ridership and operations data are clearly defined for fixed-route and DAR services, costs assigned to fixed-route and DAR are less clear. To calculate costs, therefore, we assumed that fixed-route and DAR services have the same marginal operating cost and used this data to impute an hourly operating cost per revenue hour. This is considered a fair assumption, given both vehicles and drivers are shared between the services. Accordingly, total operating costs for the fixed-route is based on the operating cost per revenue hour multiplied by the total revenue hours. Total operating costs for the DAR service, in turn, was calculated using total costs less costs assigned to fixed-route services. In all cases, operating costs per revenue hour are the same.

The performance data is based on service inputs, outputs and consumption. *Service inputs* are summarized as total annual operating costs, while *service outputs* include revenue service hours and revenue service miles. *Service consumption* includes ridership and farebox revenues. The performance data is then expressed in terms of three performance indicators commonly used in the transit industry, which can be categorized as follows:

- **Cost efficiency.** These indicators are the ratios of *service inputs* to *service outputs*, and measure the efficiency of resource allocation within the agency.
- **Cost effectiveness.** These indicators are the ratio of *service inputs* to *service consumption* and measure how well the service is utilized by the community.
- **Service effectiveness.** These indicators are the ratio of *service consumption* to *service outputs* and measure how well the capacity of service is being utilized by the consumer.

CATS Fixed-Route Service

An assessment of how well fixed-route services have performed with regard to the three categories of performance indicators (cost efficiency, cost effectiveness, and service efficiency), as well as average subsidy per passenger is shown in Figure 6-1 and discussed below.

- **Farebox Recovery Ratio.** This indicator measures cost effectiveness and is the ratio of fare revenue to total operating costs. A general rule of thumb for a small city transit operation is to maintain a recovery rate of 10-15% (e.g., fares account for 10% of operating costs); rural systems generally perform on the lower end of this range. The farebox recovery ratio for the CATS system exceeds this rule of thumb, with ranges

between 15%-19% over the past three years. This is considered a solid performance. CATS may consider setting a target goal of 20% farebox recovery for future years.

- **Operating Cost per Passenger.** This standard also measures cost effectiveness by assessing total operating costs over consumption of service (total ridership). CATS fixed-route operating cost per passenger is between \$5.23 and \$5.51 per passenger. These costs are within an acceptable range for a mix of small city and rural services. Year-on-year cost increases are also within 2-3%, which is also a reasonable rate and appropriately reflect costs increases associated with driver wages, fuel and insurance costs.
- **Operating Cost per Revenue Hour.** This indicator is a good measure of cost efficiency. It involves dividing total operating costs by the number of annual revenue hours (i.e., when vehicle is in service and working to carry passengers). As discussed, due to limitations in the data, this number is estimated based on both fixed-route and DAR services and includes Medicaid services. The estimated cost per revenue hour in 2008 is \$37.18. This represents an annual cost increase of 3-4% since 2006 when operating costs per revenue hour were \$34.59. This is generally considered low, but the lack of budget information such as direct costs associated with management and administration of the system suggest that the low rate may reflect budgeting methods rather than service delivery efficiencies.
- **Passengers per Revenue Hour and Passengers per Revenue Mile.** These indicators provide a good measure of service effectiveness – that is, how well is the service being consumed in relation to the amount of service available. Both of these indicators track closely to each other, and both remained relatively stable between 2006 and 2008. On average, CATS carries 6.6 to 6.7 passengers per hour and about .35 passengers per mile.
- **Average Subsidy per Passenger.** This indicator is closely related to operating cost per passenger, but also factors in fare revenues. This indicator is often better understood by policy makers who want to know how much each passenger is being subsidized. In the case of fixed-route services, subsidy costs range from \$4.36 and \$4.55 per trip.

**Figure 6-1 CATS Performance Data and Indicators
Fixed-Route Services, All Riders (STOA and Medicaid) 2006-2008**

	Annual Data			Year on Year Change	
	2006	2007	2008	2006-2007	2007-2008
Operating Data					
Ridership	153,167	140,564	145,000	-8.2%	3.2%
Revenue Hours	23,160	21,175	21,500	-8.6%	1.5%
Revenue Miles	427,998	397,518	398,000	-7.1%	0.1%
Operating Costs	\$ 801,055	\$ 757,437	\$ 799,270	-5.4%	5.5%
Farebox Revenue	\$ 133,493	\$ 117,216	\$ 149,916	-12.2%	27.9%
Performance Indicators					
Cost Efficiency					
Operating Cost per Revenue Hour	\$ 34.59	\$ 35.77	\$ 37.18	3.4%	3.9%
Cost Effectiveness					
Operating Cost per Passenger	\$ 5.23	\$ 5.39	\$ 5.51	3.0%	2.3%
Farebox Recovery Ratio	16.7%	15.5%	18.8%	-7.1%	21.2%
Average Subsidy per Passenger	\$ 4.36	\$ 4.55	\$ 4.48	4.5%	-1.7%
Service Efficiency					
Passengers per Revenue Hour	6.61	6.64	6.74	0.4%	1.6%
Passengers per Revenue Mile	0.36	0.35	0.36	-1.2%	3.0%

Source: Nelson\Nygaard Consulting Associates based on Ontario County Transportation Department data

DAR Service

As discussed CATS does not separate out costs incurred by DAR and Medicaid passengers. This has several implications for our performance analysis. Firstly, DAR passengers pay a fare for their ride, but Medicaid passengers do not. Because we are not able to identify DAR passengers separately, we are not able to assign fares to DAR passengers only therefore we cannot assess parameters that take fares into account (i.e. farebox recovery and average subsidy per passenger). In addition, overall costs to transport Medicaid clients are typically higher as compared with general public DAR, reflecting that Medicaid clients sometimes take longer trips to regional services and/or may have specialized needs which make sharing rides more difficult. Our performance analysis, therefore, concentrates on indicators associated with cost and service efficiency rather than cost effectiveness. The parameters are discussed below and shown in Figure 6-2.

- **Operating Cost per Passenger.** This standard measures cost effectiveness by assessing total operating costs over consumption of service (total ridership). Operating costs per passenger for the CATS DAR service ranged between \$30.68 per passenger in 2006 to \$32.76 in 2008. These costs are on the high end of industry standards, which typically show costs closer to \$20 - \$25 per passenger for DAR services only. However, these costs include Medicaid passengers, who as discussed, typically have higher operating costs per passengers. Costs per passenger have increased between 3 and 4% per year, which is consistent with industry trends.
- **Operating Cost per Revenue Hour.** This indicator measures cost efficiency by dividing total operating costs by the number of annual service hours. As discussed, due to limitations in the data, in order to compute other performance indicators this data was computed and are estimated between \$34.60 and \$37.18 per hour, which are within industry standards.
- **Passengers per Revenue Hour and Passengers per Revenue Mile.** These indicators measure service effectiveness – that is, how well is the service is being consumed in relation to the amount of service available. CATS' DAR services carry about 1.1 passengers per revenue hour and 0.06 per revenue mile. In general, data suggests that the CATS' DAR service performs slightly lower as compared to other similar systems. However, given the integration of Medicaid passengers into the accounting, it is difficult to determine the relative performance of the individual systems.

**Figure 6-2 CATS Performance Data and Indicators
DAR Services, All Riders (STOA and Medicaid) 2006-2008**

	Annual Data			Year on Year Change	
	2006	2007	2008	2006-2007	2007-2008
Operating Data					
Ridership	77,976	81,557	82,000	4.6%	0.5%
Revenue Hours	69,152	73,833	72,250	6.8%	-2.1%
Revenue Miles	1,338,355	1,353,497	1,354,000	1.1%	0.0%
Operating Costs	\$ 2,392,513	\$ 2,570,206	\$ 2,685,918	7.4%	4.5%
Farebox Revenue	\$ 28,271	\$ 29,885	\$ 38,254	5.7%	28.0%
Performance Indicators					
Cost Efficiency					
Operating Cost per Revenue Hour	\$ 34.60	\$ 34.81	\$ 37.18	0.6%	6.8%
Cost Effectiveness					
Operating Cost per Passenger	\$ 30.68	\$ 31.51	\$ 32.76	2.7%	3.9%
Service Efficiency					
Passengers per Revenue Hour	1.13	1.10	1.13	-2.0%	2.7%
Passengers per Revenue Mile	0.06	0.06	0.06	3.4%	0.5%

Lessons for Service Improvements

The performance analysis suggests that CATS services perform well on the indicators measured. The main challenge uncovered by the analysis is the lack of data and the inability to measure performance for the individual types of services, such as general public DAR services. Direct administration costs incurred by Ontario County, for example, are not fully accounted for in the budget sheets received by the study team. We also recognize that short comings in data collection largely reflects the integration and coordination of Medicaid and non-Medicaid passengers, a strategy which helps reduce costs and improve system efficiency overall. Recommendations called for in other parts of this study include purchasing a scheduling software system. This system may also improve passenger billing and tracking, and help CATS separate out and assign costs to different billing systems.

The Nelson\Nygaard team also recommends developing a simple and clear performance management system so that both CATS and Ontario County Planning Department can track and report on the system's performance for key industry measures. CATS may also use the performance management system to set standards and goals for the system.

- Identify a set of performance indicators for the fixed-route and DAR systems that can be easily recorded and measured. These indicators may be the six used for this analysis:
 - Operating cost per revenue hour
 - Operating cost per passenger
 - Farebox recovery ratio
 - Average subsidy per passenger
 - Passengers per revenue hour
 - Passengers per revenue mile
- Work with First Transit to ensure that data can be easily and reliably collected and reported, recognizing that some data may be tracked more easily with new scheduling software.
- Identify a set of peer agencies with similar operating characteristics and operating environment as Ontario County. Measure and track performance of these peer agencies against the CATS system. This will provide a measure of relative performance for Ontario County.
- Use historical data and peer agencies to set performance standards for CATS systems. Measure performance against these standards annually and report to County Supervisors.