

APPENDIX I

Cost Allocation Methodology

FIXED-ROUTE, TRIPPER, NIGHT, SENIOR AND DIAL-A-RIDE SERVICE

The cost allocation model used in this plan has been modified from the one that was used in previous Transit Plans. The model was originally designed as a way to calculate the fee that East Grand Forks would be charged by Grand Forks for providing bus service. The model is also effective as a way to compare performance of transit routes and services. The model is designed to spread costs to each service and route for the actual cost it requires to run the service. There are three main categories in running a transit service: driver, mechanics, and administration. All other expenses can be placed in one of these categories and allocated across the system.

In some cases spreading the costs to a transit route seems easy. For example driver salaries can be allocated to each route based upon the amount of time it takes to run an individual route, from the time it leaves the bus barn until the time it returns. However, we also have driver time for training, as well as lunches etc. We can still use the total hours it takes run each route, but instead of an individual driver's salary being allocated to an individual route, we total up all driver salaries on the whole system. This total is then assigned to each route or service based upon the percentage of driver hours of the total system. This method of driver assignment is also beneficial since it does not skew results depending on one route having a more senior driver (higher salary) than another.

The next category is mechanics. Instead of charging each individual route for the performance of one particular bus, the total of all mechanic salaries and bus repairs including parts and any outside work are totaled. This amount is then spread across each route and service based upon the percentage of total vehicle miles of the whole system an individual route or service runs.

The last category is administration. This amount is more difficult to assign. In the past peak vehicles were used. A peak vehicle is a service or route that requires a vehicle to be providing service during peak service time (7:00 am – 10:00 am and 3:00 pm – 6:00 pm). A hybrid of this system is now used since night bus service (which is not a peak vehicle) operates in Grand Forks but not East Grand Forks.

Since Dial-A-Ride is directly billed by the taxi-cab companies to each city the operating costs for this system are not reflected in the cost allocation model. However, the administrative staff in Grand Forks does provide oversight of this service for both communities. For this reason, these costs are divided the same as the rest of the administration fees.

Farebox assignment also proved to be a challenge in the cost-allocation model. In 2002, no registering fareboxes were in place, which could provide a direct revenue amount to each route or service. The senior rider service has a separate accounting system from the rest of the fixed route service as does the DAR. But for the remainder of the fixed route, tripper and night bus service farebox revenue was assigned based on the

percentage of ridership (minus transfers) each individual route had compared to the total ridership (minus transfers).

The following tables show the cost allocation model for the system.

PERFORMANCE MEASURES FOR THE TRANSIT SYSTEM (With Transfers)

<u>System Statistics</u>	<u>Route 1</u>	<u>Route 2</u>	<u>Route 3</u>	<u>Route 4</u>	<u>Route 5</u>	<u>Route 6</u>	<u>Route 7</u>	<u>Route 8</u>	<u>Route 9</u>	<u>Route 10</u>	<u>Route 11</u>	<u>Routes 1-11</u>	<u>GF</u> <u>Routes 1-9</u>	<u>EGF</u> <u>Routes 10-11</u>	<u>Trippers</u>	<u>Fixed & Tripper</u>	<u>Night</u>	<u>Senior Rider</u>	<u>Dial-A-Ride</u>
Number of Active Vehicles in the fleet	0.5	0.5	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	6	5	1	4	10	0.5	2	N/A
Total Vehicle Miles	28831	19927	52541	23397	25899	25849	26939	24706	24706	33734	15086	301616	252795.8	48820.2	22046	323662	23148	49380	N/A
Total 2002 Trips (incl. transfers)	14255	15329	49367	22752	25386	21227	25366	10896	10450	13910	3972	212910	195028	17882	49070	261980	6674	15267	45373
Total Service Hours	1842.25	1842.25	3684.7	1865.75	1765.5	1865.75	1765.5	1739.9	1739.9	2407.5	1123.5	21642.5	18111.5	3531	2420	24062.5	1381.5	4420	N/A
Total Operating Hours																		2295	3600
Total Operating Costs																			
																			\$300,532
																			\$42,787
Vehicle Hours (\$23.81 Unit Cost)	\$43,864	\$43,864	\$87,733	\$44,424	\$42,037	\$44,424	\$42,037	\$41,427	\$41,427	\$57,323	\$26,751	\$515,308	\$431,235	\$84,073	\$57,620	\$572,928	\$32,894	\$105,240	
Vehicle Miles (\$0.66 Unit Cost)	\$19,029	\$13,152	\$34,677	\$15,442	\$17,094	\$17,060	\$17,779	\$16,306	\$16,306	\$22,264	\$9,957	\$199,067	\$166,845	\$32,221	\$14,550	\$213,617	\$15,278	\$32,591	
<u>Peak Vehicle (\$22,534.86 Unit Cost)</u>	<u>\$11,267</u>	<u>\$11,267</u>	<u>\$22,535</u>	<u>\$11,267</u>	<u>\$11,267</u>	<u>\$11,267</u>	<u>\$11,267</u>	<u>\$11,267</u>	<u>\$11,267</u>	<u>\$11,267</u>	<u>\$11,267</u>	<u>\$11,267</u>	<u>\$112,674</u>	<u>\$22,535</u>	<u>\$90,139</u>	<u>\$225,349</u>	<u>\$11,267</u>	<u>\$37,392</u>	<u>\$2,177</u>
Total Operating Costs	\$74,160	\$68,283	\$144,944	\$71,133	\$70,398	\$72,751	\$71,083	\$69,001	\$69,001	\$93,213	\$50,334	\$849,584	\$710,754	\$143,547	\$162,310	\$1,016,612	\$59,439	\$175,223	\$345,496
Total Revenue from Fares *	\$6,698	\$6,502	\$23,057	\$10,321	\$12,157	\$9,526	\$11,758	\$4,807	\$4,751	\$6,035	\$1,409	\$97,021	\$89,578	\$7,444	\$31,398	\$128,420	\$4,270	\$16,768	\$94,341
<u>Cost Efficiency</u>																			
Miles per Vehicle	57663	39855	52541	46795	51799	51698	53877	49412	49412	67468	30172	50269	50559	48820	5512	32366	46296	24690	N/A
Cost per Vehicle Mile	\$2.57	\$3.43	\$2.76	\$3.04	\$2.72	\$2.81	\$2.64	\$2.79	\$2.79	\$2.76	\$3.34	\$2.82	\$2.81	\$2.94	\$7.36	\$3.14	\$2.57	\$3.55	N/A
<u>Cost Effectiveness</u>																			
Cost per Passenger Trip	\$5.20	\$4.45	\$2.94	\$3.13	\$2.77	\$3.43	\$2.80	\$6.33	\$6.60	\$6.70	\$12.67	\$3.99	\$3.64	\$8.03	\$3.31	\$3.88	\$8.91	\$11.48	\$7.61
Cost per Service Hours	\$40.26	\$37.07	\$39.34	\$38.13	\$39.87	\$38.99	\$40.26	\$39.66	\$39.66	\$38.72	\$44.80	\$39.26	\$39.24	\$40.65	\$67.07	\$42.25	\$43.02	\$39.64	N/A
Farebox Recovery Percentage	9.03%	9.52%	15.91%	14.51%	17.27%	13.09%	16.54%	6.97%	6.89%	6.47%	2.80%	11.42%	12.60%	5.19%	19.34%	12.63%	7.18%	9.57%	27.31%
<u>Service Effectiveness</u>																			
Passengers per Mile	0.4944	0.7692	0.9396	0.9724	0.9802	0.8212	0.9416	0.4410	0.4230	0.4123	0.2633	0.7059	0.7715	0.3663	2.2258	0.8094	0.2883	0.3092	N/A
Passengers per Hour	7.7378	8.3208	13.3978	12.1946	14.3789	11.3772	14.3676	6.2624	6.0061	5.7778	3.5354	9.8376	10.7682	5.0643	20.2769	10.8875	4.8310	3.4541	N/A
Passengers per Oper Hour																		6.65	12.60

* Revenues were calculated by taking the sum of all fares and assigning them proportionally to the routes based on ridership

Fixed Route	Trippers	Night	Senior Ride	Dial-A-Ride
\$849,584	162310	59438.978	175222.8	345496.13

PERFORMANCE MEASURES FOR THE TRANSIT SYSTEM (Excluding Transfers)

<u>System Statistics</u>	<u>Route 1</u>	<u>Route 2</u>	<u>Route 3</u>	<u>Route 4</u>	<u>Route 5</u>	<u>Route 6</u>	<u>Route 7</u>	<u>Route 8</u>	<u>Route 9</u>	<u>Route 10</u>	<u>Route 11</u>	<u>Routes 1-11</u>	GF <u>Routes 1-9</u>	EGF <u>Routes 10-11</u>	<u>Trippers</u>	Fixed & <u>Tripper</u>	<u>Night</u>	<u>Senior Rider</u>	<u>Dial-A-Ride</u>
Number of Active Vehicles in the fleet	0.5	0.5	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	6	5	1	4	10	0.5	2	N/A
Total Vehicle Miles	28831	19927	52541	23397	25899	25849	26939	24706	24706	33734	15086	301616	252795.8	48820.2	22046	323662	23148	49380	N/A
Total 2002 Trips (excl. transfers)	10468	10161	36034	16130	19000	14888	18375	7513	7425	9431	2202	151627	139994	11633	49070	200697	6674	15267	45373
Total Service Hours	1842.25	1842.25	3684.7	1865.75	1765.5	1865.75	1765.5	1739.9	1739.9	2407.5	1123.5	21642.5	18111.5	3531	2420	24062.5	1381.5	4420	N/A
Total Operating Hours																		2295	3600
Total Operating Costs																			
																			\$300,532
																			\$42,787
Vehicle Hours (\$23.81 Unit Cost)	\$43,864	\$43,864	\$87,733	\$44,424	\$42,037	\$44,424	\$42,037	\$41,427	\$41,427	\$57,323	\$26,751	\$515,308	\$431,235	\$84,073	\$57,620	\$572,928	\$32,894	\$105,240	
Vehicle Miles (\$0.66 Unit Cost)	\$19,029	\$13,152	\$34,677	\$15,442	\$17,094	\$17,060	\$17,779	\$16,306	\$16,306	\$22,264	\$9,957	\$199,067	\$166,845	\$32,221	\$14,550	\$213,617	\$15,278	\$32,591	
Peak Vehicle (\$22,534.86 Unit Cost)	\$11,267	\$11,267	\$22,535	\$11,267	\$11,267	\$11,267	\$11,267	\$11,267	\$11,267	\$11,267	\$11,267	\$135,209	\$112,674	\$22,535	\$90,139	\$225,349	\$11,267	\$37,392	\$2,177
Total Operating Costs	\$74,160	\$68,283	\$144,944	\$71,133	\$70,398	\$72,751	\$71,083	\$69,001	\$69,001	\$93,213	\$50,334	\$849,584	\$710,754	\$143,547	\$162,310	\$1,016,612	\$59,439	\$175,223	\$345,496
Total Revenue from Fares *	\$6,698	\$6,502	\$23,057	\$10,321	\$12,157	\$9,526	\$11,758	\$4,807	\$4,751	\$6,035	\$1,409	\$97,021	\$89,578	\$7,444	\$31,398	\$128,420	\$4,270	\$16,768	\$94,341
Cost Efficiency																			
Miles per Vehicle	57663	39855	52541	46795	51799	51698	53877	49412	49412	67468	30172	50269	50559	48820	5512	32366	46296	24690	N/A
Cost per Vehicle Mile	\$2.57	\$3.43	\$2.76	\$3.04	\$2.72	\$2.81	\$2.64	\$2.79	\$2.79	\$2.76	\$3.34	\$2.82	\$2.81	\$2.94	\$7.36	\$3.14	\$2.57	\$3.55	N/A
Cost Effectiveness																			
Cost per Passenger Trip	\$7.08	\$6.72	\$4.02	\$4.41	\$3.71	\$4.89	\$3.87	\$9.18	\$9.29	\$9.88	\$22.86	\$5.60	\$5.08	\$12.34	\$3.31	\$5.07	\$8.91	\$11.48	\$7.61
Cost per Service Hours	\$40.26	\$37.07	\$39.34	\$38.13	\$39.87	\$38.99	\$40.26	\$39.66	\$39.66	\$38.72	\$44.80	\$39.26	\$39.24	\$40.65	\$67.07	\$42.25	\$43.02	\$39.64	N/A
Farebox Recovery Percentage	9.03%	9.52%	15.91%	14.51%	17.27%	13.09%	16.54%	6.97%	6.89%	6.47%	2.80%	11.42%	12.60%	5.19%	19.34%	12.63%	7.18%	9.57%	27.31%
Service Effectiveness																			
Passengers per Mile	0.3631	0.5099	0.6858	0.6894	0.7336	0.5760	0.6821	0.3041	0.3005	0.2796	0.1460	0.5027	0.5538	0.2383	2.2258	0.6201	0.2883	0.3092	N/A
Passengers per Hour	5.6822	5.5155	9.7794	8.6453	10.7618	7.9796	10.4078	4.3181	4.2675	3.9173	1.9599	7.0060	7.7296	3.2945	20.2769	8.3407	4.8310	3.4541	N/A
Passengers per Oper Hour																		6.65	12.60

* Revenues were calculated by taking the sum of all fares and assigning them proportionally to the routes based on ridership

PERFORMANCE MEASURES FOR THE TRANSIT SYSTEM (Excluding Transfers)

<u>System Statistics</u>	Kelly	Kelly	Kelly	Kelly	Schroeder	Schroeder	Schroeder	Schroeder	Valley	Valley	Agassiz	Agassiz		Trippers
	<u>B1</u>	<u>B2</u>	<u>Backup-am</u>	<u>Backup-pm</u>	<u>D1</u>	<u>D2</u>	<u>Backup-am</u>	<u>Backup-pm</u>	<u>E1</u>	<u>E2</u>	<u>H1</u>	<u>H2</u>		
Number of Active Vehicles in the fleet	0.25	0.25	0.5	0.5	0.25	0.25	0.5	0.5	0.25	0.25	0.25	0.25	4	4
Total Vehicle Miles	805	779	1593	1540	805	779	1593	1190	1348	1260	4940	5416	22048	22046
Total 2002 Trips (excl. transfers)	3415	4333	2830	3811	1939	4567	2750	6523	4221	4865	4663	5153	49070	49070
Total Service Hours	175	175	175	175	175	175	175	175	175	175	335	335	2420	2420
Total Operating Hours														
Total Operating Costs														
	GF													
	EGF													
Vehicle Hours (\$23.81 Unit Cost)														
Vehicle Miles (\$0.66 Unit Cost)	\$4,167	\$4,167	\$4,167	\$4,167	\$4,167	\$4,167	\$4,167	\$4,167	\$4,167	\$4,167	\$7,976	\$7,976	\$57,620	\$57,620
Peak Vehicle (\$22,534.86 Unit Cost)	\$531	\$514	\$1,051	\$1,016	\$531	\$514	\$1,051	\$785	\$889	\$832	\$3,260	\$3,575	\$14,551	\$14,550
Total Operating Costs	\$5,634	\$5,634	\$11,267	\$11,267	\$5,634	\$5,634	\$11,267	\$11,267	\$5,634	\$5,634	\$5,634	\$5,634	\$90,139	\$90,139
Total Revenue from Fares *	\$10,332	\$10,315	\$16,486	\$16,451	\$10,332	\$10,315	\$16,486	\$16,220	\$10,690	\$10,632	\$16,870	\$17,185	\$162,311	\$162,310
	\$2,185	\$2,773	\$1,811	\$2,439	\$1,241	\$2,922	\$1,760	\$4,174	\$2,701	\$3,113	\$2,984	\$3,297		\$31,398
<u>Cost Efficiency</u>														
Miles per Vehicle														
Cost per Vehicle Mile	3220	3116	3186	3080	3220	3116	3186	2380	5390	5040	19760	21664		5512
	\$12.83	\$13.24	\$10.35	\$10.68	\$12.83	\$13.24	\$10.35	\$13.63	\$7.93	\$8.44	\$3.42	\$3.17		\$7.36
<u>Cost Effectiveness</u>														
Cost per Passenger Trip														
Cost per Service Hours	\$3.03	\$2.38	\$5.83	\$4.32	\$5.33	\$2.26	\$5.99	\$2.49	\$2.53	\$2.19	\$3.62	\$3.33		\$3.31
Farebox Recovery Percentage	\$59.04	\$58.94	\$94.20	\$94.00	\$59.04	\$58.94	\$94.20	\$92.68	\$61.08	\$60.75	\$50.36	\$51.30		\$67.07
	21.15%	26.88%	10.98%	14.82%	12.01%	28.33%	10.67%	25.73%	25.27%	29.28%	17.69%	19.19%		19.34%
<u>Service Effectiveness</u>														
Passengers per Mile														
Passengers per Hour	4.2422	5.5623	1.7765	2.4747	2.4087	5.8626	1.7263	5.4815	3.1325	3.8611	0.9439	0.9514		2.2258
Passengers per Oper Hour	19.5143	24.7600	16.1714	21.7771	11.0800	26.0971	15.7143	37.2743	24.1200	27.8000	13.9194	15.3821		20.2769

