

## Appendix B: Detailed Description of RTOI Calculations

The first step in identifying areas with the greatest propensity for transit use involves the calculation of the percent distributions of the five demographic characteristics for each census block group, the assumed geographic unit of analysis.) This process results in a table of values indicating the percentage of elderly, youth, population in poverty, and zero-vehicle households as well as the residential density in each census block group.

From the percentage ranges and densities, an average and standard deviation are calculated for each characteristic. Statistically, the standard deviation may be thought of as a measure of distance from the average value. According to an empirical rule of thumb, for most moderately sized data sets with a bell-shaped distribution, approximately 68 percent of the data values lie within one standard deviation of their average and approximately 95 percent of the data values lie within two standard deviations of their average. Each of the five characteristics was then stratified into four segments based on the following break points: average, average plus one standard deviation, and average plus two standard deviations. The census block groups fall into one of the following four categories for each characteristic: below average (low), above average but within one standard deviation (medium), between one and two standard deviations above average (high), and more than two standard deviations above average (very high).

The next step involves the assignment of discrete numerical scores to each of the four categories established for each demographic characteristic. These scores serve two basic purposes: to provide uniform ranking to all of the census block groups within a particular category and to differentiate numerically among the four categories for each characteristic. A comparative probability estimation method is utilized to develop the scores. First the probability that a block group would be part of a specific category for a given characteristic is calculated for each category. For example, if two out of 47 block groups are part of the “far above average” category in terms of percent elderly, this means that there is a 4.3 percent probability ( $2 \div 47$ ) that any one of the census block groups would fall within the range established for that particular category for the elderly characteristic.

After the probabilities are calculated for each characteristic’s categories, they are then used to estimate the categories’ score via comparative probability ratios. That is, the probability percentage for each category is divided into the probability percentage for the “below average” category. This numerator is selected so that, for each characteristic, the block groups in the “below average” category would receive a score of one (1). Using the “far above average” example cited earlier, if the probability for the “below average” category were 57.4 percent, then the score for this category would be calculated by dividing 57.4 percent by 4.3 percent. The score would equal 13.50. This means of scoring recognizes the relative distribution of transit-related characteristics throughout the service area or county and assigns a higher score with more highly skewed distribution, i.e., if only a few block groups display a very high concentration of a particular characteristic.

Scores for population in poverty, zero vehicle households, and residential density are double-weighted because these variables are more closely associated than the age variables with transit use. A composite score is then obtained for each census block group by summing the weighted scores for each of the five individual categories. The census block groups are then ranked by composite score and stratified into four levels using the same method (averages and standard deviations) that was used to develop characteristic categories. Each block group is categorized as exhibiting very high (4), high (3), medium (2), or low (1) transit orientation.

**Table B1**  
**RTOI Data for Douglas County**

Census Tract	Block Group	Pop Density	PD Score *2	% Youth pop	Youth Score	% Elderly pop	Elderly Score	% pop with income below poverty level	Poverty Score *2	% 0-vehicle hhs	Vehicle Score *2	Weighted Sum of Scores	RTOI
000100	2	2,286	1.00	19.7%	1.22	15.3%	5.40	3.9%	1.00	6.5%	2.25	15.12	1
000200	1	631	1.00	16.4%	1.00	5.2%	1.00	11.7%	1.00	8.9%	3.38	12.75	1
000200	2	3,648	1.00	20.0%	1.22	3.2%	1.00	21.9%	2.08	8.9%	3.38	15.13	1
000200	3	4,630	1.93	24.1%	1.22	2.0%	1.00	18.9%	1.00	8.9%	3.38	14.83	1
000200	4	3,064	1.00	14.4%	1.00	30.7%	13.50	21.3%	2.08	8.9%	3.38	27.40	3
000200	5	4,464	1.93	21.6%	1.22	10.5%	2.08	16.5%	1.00	8.9%	3.38	15.91	1
000200	6	810	1.00	36.8%	22.00	0.9%	1.00	20.3%	2.08	8.9%	3.38	35.90	4
000300	1	13,540	9.00	0.0%	1.00	3.3%	1.00	51.6%	9.00	8.8%	2.25	42.50	4
000300	2	10,603	9.00	6.8%	1.00	3.6%	1.00	33.0%	2.08	8.8%	2.25	28.65	3
000300	3	12,767	9.00	2.8%	1.00	0.6%	1.00	55.5%	9.00	8.8%	2.25	42.50	4
000300	4	12,650	9.00	2.6%	1.00	1.0%	1.00	41.8%	6.75	8.8%	2.25	38.00	4
000300	5	4,483	1.93	24.7%	1.22	5.8%	1.00	2.1%	1.00	8.8%	2.25	12.58	1
000400	1	1,004	1.00	0.0%	1.00	1.0%	1.00	41.5%	6.75	10.8%	3.38	24.25	2
000400	2	5,821	1.93	1.5%	1.00	0.0%	1.00	60.7%	9.00	10.8%	3.38	30.61	3
000501	1	2,070	1.00	25.4%	1.22	5.4%	1.00	16.5%	1.00	7.9%	2.25	10.72	1
000501	2	4,286	1.00	18.7%	1.22	8.3%	2.08	14.8%	1.00	7.9%	2.25	11.80	1
000502	1	6,043	1.93	7.2%	1.00	2.3%	1.00	43.8%	6.75	8.2%	2.25	23.86	2
000502	2	6,178	1.93	17.6%	1.22	7.0%	1.00	23.0%	2.08	8.2%	2.25	14.73	1
000502	3	3,616	1.00	19.0%	1.22	9.5%	2.08	7.2%	1.00	8.2%	2.25	11.80	1
000502	4	7,578	1.93	5.1%	1.00	5.5%	1.00	29.0%	2.08	8.2%	2.25	14.51	1
000601	1	611	1.00	23.5%	1.22	8.2%	2.08	11.4%	1.00	2.6%	1.00	9.30	1
000601	2	5,244	1.93	28.3%	3.67	9.7%	2.08	8.9%	1.00	2.6%	1.00	13.60	1
000601	3	2,800	1.00	5.6%	1.00	15.6%	5.40	29.3%	2.08	2.6%	1.00	14.55	1
000601	4	4,736	1.93	24.3%	1.22	4.4%	1.00	11.0%	1.00	2.6%	1.00	10.08	1
000701	1	3,948	1.00	30.9%	3.67	4.6%	1.00	3.8%	1.00	2.5%	1.00	10.67	1
000702	1	3,914	1.00	16.5%	1.00	4.9%	1.00	22.2%	2.08	5.1%	1.00	10.15	1
000702	2	4,348	1.00	15.7%	1.00	10.1%	2.08	23.3%	2.08	5.1%	1.00	11.23	1
000702	3	4,074	1.00	12.2%	1.00	6.7%	1.00	23.7%	2.08	5.1%	1.00	10.15	1
000702	4	4,032	1.00	25.1%	1.22	13.7%	2.08	7.9%	1.00	5.1%	1.00	9.30	1
000797	1	2,473	1.00	17.5%	1.22	21.6%	13.50	10.8%	1.00	6.0%	1.00	20.72	2
000797	2	4,486	1.93	22.9%	1.22	8.9%	2.08	13.7%	1.00	6.0%	1.00	11.16	1
000801	1	940	1.00	18.5%	1.22	3.0%	1.00	17.6%	1.00	0.7%	1.00	8.22	1
000802	1	4,713	1.93	22.7%	1.22	7.4%	1.00	14.9%	1.00	5.8%	1.00	10.08	1
000802	2	1,233	1.00	10.1%	1.00	5.6%	1.00	44.1%	6.75	5.8%	1.00	19.50	2
000901	1	2,628	1.00	14.6%	1.00	16.7%	5.40	9.3%	1.00	6.2%	1.00	12.40	1
000901	2	4,547	1.93	13.7%	1.00	16.7%	5.40	14.7%	1.00	6.2%	1.00	14.26	1
000901	3	8,403	9.00	16.6%	1.00	6.1%	1.00	32.8%	2.08	6.2%	1.00	26.15	3
000901	4	6,637	1.93	12.6%	1.00	5.3%	1.00	31.6%	2.08	6.2%	1.00	12.01	1
000901	5	9,540	9.00	17.2%	1.00	2.2%	1.00	24.2%	2.08	6.2%	1.00	26.15	3
000902	1	1,265	1.00	26.7%	3.67	9.2%	2.08	10.4%	1.00	0.0%	1.00	11.74	1
001001	1	3,348	1.00	13.6%	1.00	11.2%	2.08	7.0%	1.00	4.7%	1.00	9.08	1
001001	2	573	1.00	6.3%	1.00	11.5%	2.08	4.8%	1.00	4.7%	1.00	9.08	1
001002	1	4,956	1.93	28.7%	3.67	4.9%	1.00	14.6%	1.00	4.3%	1.00	12.52	1
001002	2	692	1.00	29.2%	3.67	4.7%	1.00	2.3%	1.00	4.3%	1.00	10.67	1
001202	3	2,738	1.00	32.0%	3.67	11.2%	2.08	2.9%	1.00	5.9%	1.00	11.74	1
001203	3	1,078	1.00	21.1%	1.22	7.9%	2.08	4.5%	1.00	4.2%	1.00	9.30	1
001203	4	1,541	1.00	24.1%	1.22	15.9%	5.40	8.5%	1.00	4.2%	1.00	12.62	1
Total													
Average		4,376		17.34%		7.85%		20.11%		6.29%		16.81	
Standard Deviation		3,251		9.07%		6.02%		14.78%		2.56%		9.15	