



# Transit Needs Assessment

## INTRODUCTION

A key step in developing and evaluating transit plans is a careful analysis of the mobility needs of various segments of the population and the potential ridership of transit services. Transit demand analysis is the basic determination of the demand for public transportation in a given area. There are several factors that affect demand, not all of which can be forecast. Since demand estimation is an important task in developing any transportation plan, several methods of estimation have been developed in the transit field. The analysis makes intensive use of the demographic data and trends discussed previously.



Chapter VII presents an analysis of the demand for Washington County Transit services based on standard demand estimation techniques. The transit demand identified in this chapter was used to develop and evaluate the various transit service alternatives. Several methods were used to estimate the maximum transit trip demand for Washington County Transit including the Rural Transit Demand Methodology, Fixed-Route Model, ADA Eligibility Model, and Greatest Transit Need Analysis. LSC divided the study area into urban areas (such as Hagerstown, Smithsburg, and Williamsport) and rural areas to develop a more detailed demand modeling of the existing transit service needs.

## RURAL TRANSIT DEMAND METHODOLOGY

### Transit Cooperative Research Program

An important source of information and the most recent research regarding the demand for transit services in rural areas and by persons who are elderly or disabled is the Transit Cooperative Research Program (TCRP) Project A-3: Rural Transit Demand Estimation Techniques. This study—completed by SG Associates,

Inc. and LSC Transportation Consultants, Inc.—represents the first substantial research into transit service demand in rural areas and small communities since the early 1980s. The TCRP study presents a series of formulas relating the number of participants in various types of programs in 185 transit agencies across the United States. The TCRP analytical technique uses a logit model approach for the transit demand estimation, similar to that commonly used in urban transportation models. The model incorporates an exponential equation that relates the service quantity and area demographics.

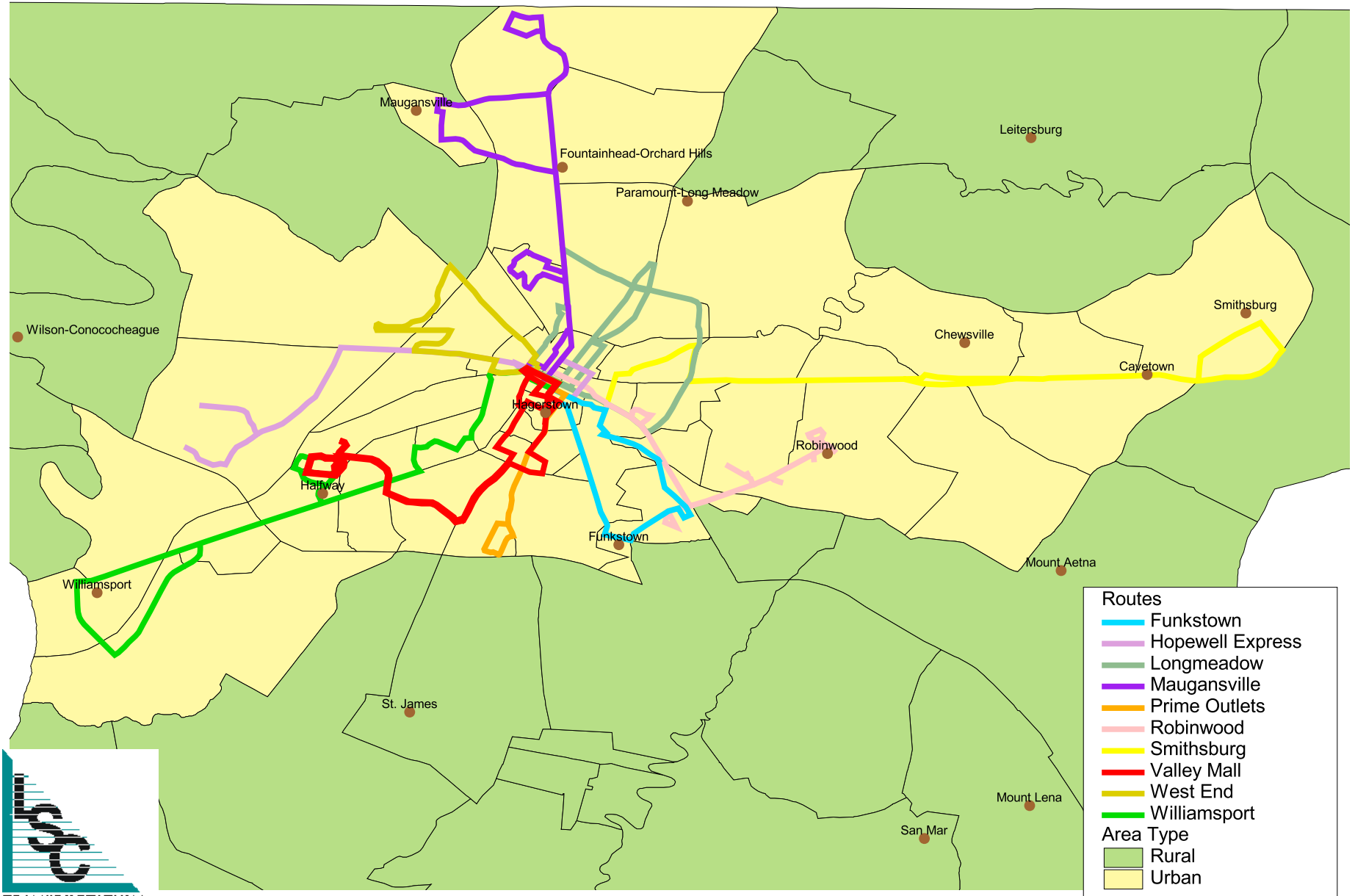
Figure VII-1 presents the areas assumed as rural and urban. The rural areas are included in the TCRP model, while the urban areas are included in the fixed-route model. The rural areas are the US Census block groups that are outside major communities and outside the service area of Washington County Transit route service.

The TCRP analysis procedure considers transit demand in two major categories:

- “*Program demand*,” which is generated by transit ridership to and from specific social service programs.
- “*Non-program demand*,” which is generated by the other mobility needs of the elderly, disabled, and general public (including youth). Examples of non-program trips may include shopping, employment, and medical trips.

For this study, LSC did not include program trip estimates. The primary reason is that the purpose of the study was to assess Washington County Transit service and its efficiency/effectiveness in meeting the demand for non-program trips in the urban and rural areas of Washington County. As presented in earlier chapters, there are several agencies (including Washington County Transit) that currently serve program trips in the region. There is an existing human service coordination plan for Washington County that identifies the needs and service gaps for program trips.

Figure VII-1  
Urban/Rural Study Area



**Routes**

- Funkstown
- Hopewell Express
- Longmeadow
- Maugansville
- Prime Outlets
- Robinwood
- Smithsburg
- Valley Mall
- West End
- Williamsport

**Area Type**

- Rural
- Urban



## **Non-Program Demand**

As with any other product or service, the demand for transit services is a function of the level of supply provided. In order to use the TCRP methodology to identify a feasible maximum demand, it is necessary to assume a high supply level measured in vehicle-miles per square mile per year. The high supply level is the upper-bound “density” of similar rural services provided in the country. The demand assessment for rural areas, therefore, can be considered to be the maximum potential ridership if a high level of service was made available throughout the rural portions of Washington County. The TCRP methodology is based on the permanent population. Therefore, the TCRP methodology is a good demand method to use for rural areas.



A maximum level of service for the rural portion of Washington County will be to serve every portion of the study area with four round-trips (eight one-way trips) on weekdays. This is equivalent to approximately 2,400 vehicle-miles of transit service per square mile per year, and is a very high level of service for rural systems. The trip rates for this model are detailed in Appendix D. Table VII-1 presents the input information used in the TCRP demand model. This information shows the total population by US Census block group, senior and mobility-limited populations, and households with zero vehicles.

**Table VII-1**  
**2008 Projected Service Area Input Data for TCRP Method**  
*Washington County*

Census Tract	Census Block Group	Land Area (sq.mi.)	2008 Total Projected Population	2008 Total Projected 60 & over	2008 Total Projected Mob-Limited	Projected Population	2008 Total Zero-Veh HHDs	2008 Total Below Poverty
000100	1	0.16	1,205	227	51	234	60	112
000100	2	0.57	2,237	415	115	494	59	190
000200	1	0.60	2,907	619	397	527	112	125
000200	2	0.57	1,360	349	64	292	18	57
000301	1	0.49	1,301	282	72	248	29	184
000301	2	0.74	2,733	547	193	689	145	280
000302	1	0.08	866	111	103	208	63	208
000302	2	0.14	2,171	224	192	546	133	406
000400	1	0.16	828	157	513	320	154	236
000400	2	0.10	633	90	450	153	113	209
000400	3	0.13	971	236	261	140	277	372
000500	1	0.11	1,393	161	330	311	203	220
000500	2	0.10	1,735	145	272	417	180	286
000500	3	0.62	1,859	353	154	495	44	396
000601	1	0.57	1,541	364	240	300	72	161
000601	2	0.21	1,164	132	108	261	53	207
000602	1	0.94	815	167	32	121	30	82
000602	2	1.23	2,329	701	205	529	145	398
000700	1	0.12	1,498	369	124	360	318	462
000700	2	0.11	1,161	148	114	368	61	251
000700	3	0.30	912	154	255	362	129	339
000800	1	0.13	1,155	484	101	114	364	386
000800	2	0.14	1,253	146	103	313	83	168
000800	3	0.18	1,602	304	42	352	60	133
000900	1	0.13	1,616	202	170	471	236	505
000900	2	1.48	943	130	24	272	24	132
000900	3	0.78	1,229	64	324	315	65	269
001001	1	0.44	1,840	109	425	805	158	575
001001	2	0.30	1,186	428	12	234	21	65
001001	3	1.35	711	96	59	189	27	112
001001	4	0.46	1,977	577	132	266	52	48
001002	1	0.22	1,095	151	91	342	20	220
001002	2	0.53	1,921	419	31	383	31	32
001002	3	0.96	1,417	321	87	358	33	46
010100	1	4.09	1,458	276	107	313	15	31
010200	1	11.25	1,475	245	18	428	12	85
010200	2	6.51	1,013	117	63	272	0	71
010200	3	3.00	1,045	244	21	219	6	27
010200	4	12.21	1,451	254	51	348	0	77
010300	1	5.61	1,584	518	39	176	38	86
010300	2	2.53	1,843	473	115	440	9	25
010300	3	1.52	3,394	917	248	870	32	56
010400	1	9.07	1,853	188	9	630	20	81
010400	2	0.78	1,349	321	14	253	35	144
010400	3	5.41	1,590	338	27	359	0	53
010400	4	5.43	1,210	357	11	180	11	68
010500	1	13.39	1,654	271	57	379	40	98
010500	2	5.18	2,274	342	6	653	21	191
010500	3	3.98	1,132	279	41	187	54	18
010500	4	9.59	925	147	8	261	0	30
010600	1	23.60	2,699	336	55	730	65	195
010600	2	11.34	927	122	6	210	25	53
010600	3	12.52	995	273	0	207	32	0
010600	4	28.31	700	143	10	117	21	55
010700	1	10.00	871	166	30	216	0	48
010700	2	13.00	2,394	477	40	521	105	380
010700	3	32.68	857	133	7	205	0	111
010801	1	2.62	1,441	360	8	213	32	135
010801	2	0.84	1,692	451	0	388	29	34
010801	3	4.05	546	159	31	142	46	74
010802	1	1.30	1,950	483	29	428	96	150
010802	2	5.52	1,133	562	32	126	118	67
010900	1	5.01	2,167	281	126	635	0	31
010900	2	8.23	1,468	281	18	238	12	144
010900	3	20.15	1,820	264	44	417	0	187
010900	4	11.52	1,620	233	0	377	11	80
011000	1	0.51	3,328	0	2,543	52	0	0
011000	2	0.61	0	0	0	0	0	0
011000	3	0.62	4,248	34	3,089	0	0	0
011100	1	0.32	1,212	444	15	166	0	9
011100	2	1.32	2,054	286	380	474	23	77
011100	3	1.02	1,445	263	41	255	48	117
011100	4	6.00	1,152	195	18	287	11	50
011201	1	2.36	1,331	341	57	270	30	138
011201	2	3.60	4,823	726	543	1,235	193	314
011201	3	0.44	1,232	237	125	280	54	57
011202	1	4.26	909	161	40	212	9	55
011202	2	5.59	983	184	50	268	0	40
011202	3	3.23	1,164	220	0	283	9	67
011301	1	4.03	3,319	474	117	969	35	251
011301	2	10.85	1,364	181	62	367	30	67
011302	1	13.09	1,667	264	55	358	8	54
011302	2	5.70	1,139	234	9	209	8	19
011302	3	6.21	758	157	33	185	0	154
011400	1	9.12	2,218	534	34	478	13	45
011400	2	2.17	1,859	374	6	404	54	187
011400	3	7.83	1,568	437	24	338	29	40
011500	1	10.98	1,646	206	53	479	13	48
011500	2	23.50	2,736	334	77	709	17	174
011500	3	14.03	1,914	329	48	358	36	50
011500	4	9.26	705	61	22	192	0	22
011600	1	13.63	2,147	305	19	489	38	71
011600	2	8.87	843	177	23	207	7	8
<b>Study Area TOTAL:</b>		<b>475</b>	<b>145,860</b>	<b>26,554</b>	<b>14,598</b>		<b>5,122</b>	<b>12,869</b>

Source: 2000 US Census Bureau, Washington County Economic Development, 2008; LSC, 2009.

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## **2008 Existing Rural Demand Estimates**

Applying the maximum feasible service density to the population in the rural areas of Washington County yields the 2008 estimated transit demand for the general (including youth), elderly, and disabled populations as shown in Table VII-2. The county's rural portion has a 2008 potential demand of about 45,745 annual trips for elderly transit service, 20,535 annual trips for disabled transit service, and 29,035 annual trips for general public transit service. Using the TCRP methodology, the county's rural portion has a 2008 total estimated demand of about 95,315 annual trips if a very high level of transit service can be provided. There is currently little to no Washington County Transit or general public transit service in the rural areas. This information was useful in developing the transit service alternatives and selecting the improved transit services for the rural areas in the region.

## **2015 Rural Demand Estimates**

The transit demand estimates for 2015 based on the TCRP methodology are provided in Table VII-3. Washington County's rural portion has a total 2015 non-program demand of about 104,835 annual trips. Realistically, meeting 100 percent of the transit demand will not be feasible. Therefore, the region must decide on a realistic goal for the area and plan its resources accordingly.

Table VII-2 2008 Estimated Non-Program Transit Need using the TCRP Method Washington County Rural Area										
Census Tract	Census Block Group	Estimated Annual Passenger-Trip Demand					Estimated Daily Transit Demand		Daily Demand Density (Trips per Sq. Mile per Day)	
		Elderly	Mobility Limited	Elderly + Mobility Limited	Low Income	Total Annual Demand	#	%		
010100	1	1,268	305	1,573	281	1,853	7	1.9%	1.8	
010200	1	1,127	50	1,177	772	1,950	8	2.0%	0.7	
010200	2	534	178	711	632	1,343	5	1.4%	0.8	
010200	3	1,121	61	1,182	246	1,428	6	1.5%	1.9	
010200	4	1,167	144	1,312	702	2,014	8	2.1%	0.6	
010400	1	867	28	895	720	1,615	6	1.7%	0.7	
010400	3	1,554	78	1,632	474	2,106	8	2.2%	1.5	
010500	1	1,241	161	1,402	878	2,279	9	2.4%	0.7	
010500	2	1,561	17	1,578	1,720	3,298	13	3.5%	2.5	
010500	4	674	22	696	263	959	4	1.0%	0.4	
010600	1	1,541	155	1,696	1,738	3,434	13	3.6%	0.6	
010600	2	560	17	577	474	1,051	4	1.1%	0.4	
010600	3	1,254	0	1,254	0	1,254	5	1.3%	0.4	
010600	4	654	28	682	492	1,173	5	1.2%	0.2	
010700	1	761	83	844	421	1,265	5	1.3%	0.5	
010700	2	2,188	111	2,299	3,423	5,722	22	6.0%	1.7	
010700	3	607	17	624	1,001	1,624	6	1.7%	0.2	
010801	3	727	89	816	667	1,483	6	1.6%	1.4	
010802	2	2,588	94	2,683	614	3,297	13	3.5%	2.3	
010900	1	1,288	361	1,648	281	1,929	8	2.0%	1.5	
010900	2	1,294	50	1,344	1,299	2,643	10	2.8%	1.3	
010900	3	1,214	128	1,342	1,685	3,027	12	3.2%	0.6	
010900	4	1,074	0	1,074	720	1,794	7	1.9%	0.6	
011000	1	0	7,056	7,056	0	7,056	28	7.4%	53.8	
011000	2	0	0	0	0	0	0	0.0%	0.0	
011000	3	160	8,836	8,996	0	8,996	35	9.4%	56.7	
011100	2	1,328	1,093	2,420	702	3,123	12	3.3%	9.3	
011100	4	894	50	944	439	1,383	5	1.5%	0.9	
011301	2	834	178	1,011	597	1,608	6	1.7%	0.6	
011302	1	1,214	155	1,369	492	1,861	7	2.0%	0.6	
011302	2	1,074	28	1,102	176	1,277	5	1.3%	0.9	
011302	3	720	94	815	1,387	2,202	9	2.3%	1.4	
011400	1	2,455	100	2,555	404	2,959	12	3.1%	1.3	
011400	2	1,708	17	1,724	1,668	3,392	13	3.6%	6.1	
011400	3	2,008	67	2,075	351	2,426	10	2.5%	1.2	
011500	1	941	150	1,090	421	1,512	6	1.6%	0.5	
011500	2	1,534	222	1,756	1,562	3,319	13	3.5%	0.6	
011500	3	1,514	133	1,648	439	2,086	8	2.2%	0.6	
011500	4	280	61	341	193	534	2	0.6%	0.2	
011600	1	1,401	55	1,456	632	2,088	8	2.2%	0.6	
011600	2	814	67	880	70	951	4	1.0%	0.4	
<b>Study Area TOTAL:</b>		<b>45,745</b>	<b>20,535</b>	<b>66,280</b>	<b>29,035</b>	<b>95,315</b>	<b>374</b>	<b>100%</b>	<b>159</b>	

Source: 2000 US Census Bureau, Washington County Economic Development, 2008; LSC, 2009.

Table VII-3 2015 Estimated Non-Program Transit Need using the TCRP Method Washington County Rural Area										
Census Tract	Census Block Group	Estimated Annual Passenger-Trip Demand					Estimated Daily Transit Demand		Daily Demand Density (Trips per Sq. Mile per Day)	
		Elderly	Mobility Limited	Elderly + Mobility Limited	Low Income	Total Annual Demand	#	%		
010100	1	1,394	338	1,733	298	2,031	8	1.9%	1.9	
010200	1	1,241	55	1,296	843	2,139	8	2.0%	0.7	
010200	2	594	200	793	702	1,496	6	1.4%	0.9	
010200	3	1,234	67	1,301	263	1,564	6	1.5%	2.0	
010200	4	1,281	161	1,442	772	2,214	9	2.1%	0.7	
010400	1	954	28	982	790	1,772	7	1.7%	0.8	
010400	3	1,715	83	1,798	527	2,324	9	2.2%	1.7	
010500	1	1,368	178	1,545	965	2,511	10	2.4%	0.7	
010500	2	1,721	17	1,738	1,878	3,616	14	3.4%	2.7	
010500	4	741	22	763	298	1,061	4	1.0%	0.4	
010600	1	1,695	172	1,866	1,913	3,780	15	3.6%	0.6	
010600	2	614	17	630	527	1,157	5	1.1%	0.4	
010600	3	1,374	0	1,374	0	1,374	5	1.3%	0.4	
010600	4	720	33	754	544	1,298	5	1.2%	0.2	
010700	1	841	94	935	474	1,409	6	1.3%	0.6	
010700	2	2,408	122	2,530	3,757	6,287	25	6.0%	1.9	
010700	3	667	22	689	1,088	1,778	7	1.7%	0.2	
010801	3	801	94	895	737	1,632	6	1.6%	1.6	
010802	2	2,849	100	2,948	667	3,616	14	3.4%	2.6	
010900	1	1,414	394	1,808	298	2,107	8	2.0%	1.6	
010900	2	1,421	55	1,476	1,422	2,898	11	2.8%	1.4	
010900	3	1,334	139	1,473	1,843	3,316	13	3.2%	0.6	
010900	4	1,181	0	1,181	790	1,971	8	1.9%	0.7	
011000	1	0	7,766	7,766	0	7,766	30	7.4%	59.2	
011000	2	0	0	0	0	0	0	0.0%	0.0	
011000	3	173	9,724	9,897	0	9,897	39	9.4%	62.4	
011100	2	1,461	1,198	2,659	772	3,432	13	3.3%	10.2	
011100	4	981	55	1,036	492	1,528	6	1.5%	1.0	
011301	2	914	194	1,108	667	1,775	7	1.7%	0.6	
011302	1	1,334	172	1,506	527	2,033	8	1.9%	0.6	
011302	2	1,187	28	1,215	193	1,408	6	1.3%	1.0	
011302	3	794	105	899	1,510	2,409	9	2.3%	1.5	
011400	1	2,702	105	2,807	456	3,264	13	3.1%	1.4	
011400	2	1,881	17	1,898	1,843	3,741	15	3.6%	6.8	
011400	3	2,208	78	2,286	386	2,672	10	2.5%	1.3	
011500	1	1,034	166	1,200	474	1,674	7	1.6%	0.6	
011500	2	1,688	244	1,932	1,720	3,652	14	3.5%	0.6	
011500	3	1,668	150	1,818	492	2,309	9	2.2%	0.6	
011500	4	307	67	373	211	584	2	0.6%	0.2	
011600	1	1,541	61	1,602	702	2,304	9	2.2%	0.7	
011600	2	894	72	966	70	1,036	4	1.0%	0.5	
<b>Study Area TOTAL:</b>		<b>50,328</b>	<b>22,593</b>	<b>72,921</b>	<b>31,914</b>	<b>104,835</b>	<b>411</b>	<b>100%</b>	<b>175</b>	

Source: 2000 US Census Bureau, Washington County Economic Development, 2008; LSC, 2009.

### **2030 Rural Demand Estimates**

The transit demand estimates for 2030 based on the TCRP methodology are provided in Table VII-4. Washington County's rural portion has a total 2015 non-program demand of about 123,977 annual trips. Transit demand in the rural areas is estimated to increase from about 95,300 annual trips in 2008 to about 123,977 annual trips in 2030. This is a 30 percent increase in transit demand over the next 22 years.

Table VII-4 2030 Estimated Non-Program Transit Need using the TCRP Method Washington County Study Area										
Census Tract	Census Block Group	Estimated Annual Passenger-Trip Demand					Estimated Daily Transit Demand		Daily Demand Density (Trips per Sq. Mile per Day)	
		Elderly	Mobility Limited	Elderly + Mobility Limited	Low Income	Total Annual Demand	#	%		
010100	1	1,648	399	2,047	369	2,416	9	1.9%	2.3	
010200	1	1,468	67	1,534	1,001	2,535	10	2.0%	0.9	
010200	2	700	233	933	825	1,759	7	1.4%	1.1	
010200	3	1,461	78	1,539	316	1,855	7	1.5%	2.4	
010200	4	1,514	189	1,703	895	2,598	10	2.1%	0.8	
010400	1	1,127	33	1,161	948	2,109	8	1.7%	0.9	
010400	3	2,028	100	2,128	614	2,742	11	2.2%	2.0	
010500	1	1,614	211	1,825	1,141	2,966	12	2.4%	0.9	
010500	2	2,035	22	2,057	2,229	4,286	17	3.5%	3.2	
010500	4	874	28	902	351	1,253	5	1.0%	0.5	
010600	1	2,001	205	2,207	2,265	4,471	18	3.6%	0.7	
010600	2	727	22	749	614	1,364	5	1.1%	0.5	
010600	3	1,628	0	1,628	0	1,628	6	1.3%	0.5	
010600	4	854	39	893	650	1,542	6	1.2%	0.2	
010700	1	987	111	1,098	562	1,660	7	1.3%	0.7	
010700	2	2,849	150	2,998	4,441	7,440	29	6.0%	2.2	
010700	3	794	22	816	1,299	2,115	8	1.7%	0.3	
010801	3	947	116	1,064	860	1,924	8	1.6%	1.9	
010802	2	3,369	116	3,485	790	4,275	17	3.4%	3.0	
010900	1	1,668	466	2,134	369	2,502	10	2.0%	2.0	
010900	2	1,681	67	1,748	1,685	3,433	13	2.8%	1.6	
010900	3	1,581	166	1,748	2,177	3,924	15	3.2%	0.8	
010900	4	1,394	0	1,394	930	2,325	9	1.9%	0.8	
011000	1	0	9,180	9,180	0	9,180	36	7.4%	70.0	
011000	2	0	0	0	0	0	0	0.0%	0.0	
011000	3	207	11,499	11,706	0	11,706	46	9.4%	73.8	
011100	2	1,728	1,420	3,148	913	4,061	16	3.3%	12.0	
011100	4	1,161	67	1,227	579	1,807	7	1.5%	1.2	
011301	2	1,081	227	1,308	790	2,098	8	1.7%	0.8	
011302	1	1,574	205	1,780	632	2,412	9	1.9%	0.7	
011302	2	1,401	33	1,434	228	1,662	7	1.3%	1.1	
011302	3	934	122	1,056	1,791	2,847	11	2.3%	1.8	
011400	1	3,189	128	3,316	527	3,843	15	3.1%	1.7	
011400	2	2,222	22	2,244	2,177	4,420	17	3.6%	8.0	
011400	3	2,608	89	2,697	456	3,154	12	2.5%	1.6	
011500	1	1,228	194	1,422	562	1,983	8	1.6%	0.7	
011500	2	1,995	288	2,283	2,019	4,302	17	3.5%	0.7	
011500	3	1,968	178	2,146	579	2,725	11	2.2%	0.8	
011500	4	360	83	443	263	707	3	0.6%	0.3	
011600	1	1,821	72	1,893	825	2,718	11	2.2%	0.8	
011600	2	1,054	89	1,143	88	1,231	5	1.0%	0.5	
<b>Study Area TOTAL:</b>		<b>59,481</b>	<b>26,736</b>	<b>86,217</b>	<b>37,759</b>	<b>123,977</b>	<b>486</b>	<b>100%</b>	<b>207</b>	

Source: 2000 US Census Bureau, Washington County Economic Development, 2008; LSC, 2009.

## **FIXED-ROUTE MODEL**

In order to analyze whether the existing transit service is meeting the community's needs based on the type of service, LSC created a fixed-route demand model. The model format is based on household vehicle ownership, average walking distance to bus stops, and frequency of operation. The basic approach is described in the paper *Demand Estimating Model for Transit Route and System Planning in Small Urban Areas*, *Transportation Research Board*, 730, 1979. This model incorporates factors for walking distance, distance traveled on the bus, and frequency of service or headway.

As an element of the development and assessment of the transit service provided by Washington County Transit, LSC developed a fixed-route model for the urban and service areas of Washington County presented in Figure VII-1. The point of this analysis is to develop a basis for evaluation of the existing and future transit services. The calibrated fixed-route model for Washington County Transit is presented in Table VII-5.

The model reflects the existing population based on 2008 population estimates for urban areas and 2008 Washington County Transit ridership. With the population increase in the region, ridership has also increased. Basic trip rates were adjusted to reflect the actual level of ridership. The percentage of households with transit access was determined by the number of households within one-quarter mile of the transit service. This distance is used because it is the assumed distance the average person will walk to use transit. The US Census block groups located entirely within this zone show 100 percent transit access. Note that the fixed-route model does not include demand for the paratransit service due to the Federal Transit Administration (FTA) ADA requirements. The model generated about 1,125 daily trips, which is consistent with Washington County Transit's current ridership base from the onboard survey counts in April 2009 and driver counts.

**Table VII-5  
2008 Estimated Fixed-Route Model - County Transit Service Area (Urban)**

Census Tract	Block Group	Total # of Hhlds 2007	# of Hhlds with		% of Hhlds with Transit Access	Hhlds Served by Transit		Basic Transit Trip Rates		Walk Distance (ft)	Walk Factor		Headway (min)	Headway Factor		Daily Transit Trips		Daily Trips # of		
			0 Auto	1 Auto		0 Auto	1 Auto	0 Auto	1 Auto		0 Auto	1 Auto		0 Auto	1 Auto					
000100	1	1,205	60	189	100%	59.7	189.1	0.4	0.04	500	1.25	1.20	60	0.6	0.85	17.9	7.7	26		
000100	2	2,237	59	384	60%	35.2	230.2	0.4	0.04	1,000	1.00	1.10	60	0.6	0.85	8.4	8.6	17		
000200	1	2,907	112	488	100%	111.7	487.6	0.4	0.04	500	1.25	1.20	60	0.6	0.85	33.5	19.9	53		
000200	2	1,360	18	154	75%	13.5	115.5	0.4	0.04	1,000	1.00	1.10	60	0.6	0.85	3.2	4.3	8		
000301	1	1,301	29	167	75%	21.6	125.2	0.4	0.04	500	1.25	1.20	60	0.6	0.85	6.5	5.1	12		
000301	2	2,733	145	343	75%	108.6	257.1	0.4	0.04	500	1.25	1.20	60	0.6	0.85	32.6	10.5	43		
000302	1	866	63	138	80%	50.4	110.6	0.4	0.04	500	1.25	1.20	60	0.6	0.85	15.1	4.5	20		
000302	2	2,171	133	370	80%	106.1	296.3	0.4	0.04	500	1.25	1.20	60	0.6	0.85	31.8	12.1	44		
000400	1	828	154	93	100%	153.7	92.9	0.4	0.04	500	1.25	1.20	60	0.6	0.85	46.1	3.8	50		
000400	2	633	113	151	100%	113.0	151.0	0.4	0.04	1,000	1.00	1.10	60	0.6	0.85	27.1	5.6	33		
000400	3	971	277	224	100%	277.0	224.0	0.4	0.04	500	1.25	1.20	60	0.6	0.85	83.1	9.1	92		
000500	1	1,393	203	298	100%	203.0	298.0	0.4	0.04	500	1.25	1.20	60	0.6	0.85	60.9	12.2	73		
000500	2	1,735	180	266	100%	180.2	266.5	0.4	0.04	500	1.25	1.20	60	0.6	0.85	54.1	10.9	65		
000500	3	1,859	44	367	75%	33.2	275.3	0.4	0.04	1,000	1.00	1.10	60	0.6	0.85	8.0	10.3	18		
000601	1	1,541	72	333	75%	53.9	249.6	0.4	0.04	1,500	0.90	1.05	60	0.6	0.85	11.6	8.9	21		
000601	2	1,164	53	290	90%	47.8	260.7	0.4	0.04	1,000	1.00	1.10	60	0.6	0.85	11.5	9.8	21		
000602	1	815	30	171	80%	23.9	137.1	0.4	0.04	1,000	1.00	1.10	60	0.6	0.85	5.7	5.1	11		
000602	2	2,329	145	551	40%	57.9	220.2	0.4	0.04	2,500	0.20	0.03	60	0.6	0.85	2.8	0.2	3		
000700	1	1,498	318	343	100%	318.4	342.8	0.4	0.04	500	1.25	1.20	60	0.6	0.85	95.5	14.0	110		
000700	2	1,161	61	178	100%	60.8	178.0	0.4	0.04	500	1.25	1.20	60	0.6	0.85	18.2	7.3	26		
000700	3	912	129	128	75%	97.0	96.2	0.4	0.04	1,000	1.00	1.10	60	0.6	0.85	23.3	3.6	27		
000800	1	1,155	364	250	100%	363.8	249.9	0.4	0.04	500	1.25	1.20	60	0.6	0.85	109.1	10.2	119		
000800	2	1,253	83	258	100%	82.9	257.6	0.4	0.04	1,000	1.00	1.10	60	0.6	0.85	19.9	9.6	30		
000800	3	1,602	60	292	100%	59.7	291.9	0.4	0.04	1,500	0.90	1.05	60	0.6	0.85	12.9	10.4	23		
000900	1	1,616	236	282	100%	235.5	281.9	0.4	0.04	1,500	0.90	1.05	60	0.6	0.85	50.9	10.1	61		
000900	2	943	24	125	100%	24.3	124.9	0.4	0.04	1,500	0.90	1.05	60	0.6	0.85	5.3	4.5	10		
000900	3	1,229	65	101	100%	65.2	100.6	0.4	0.04	2,500	0.20	0.03	60	0.6	0.85	3.1	0.1	3		
001001	1	1,840	158	192	100%	158.1	192.4	0.4	0.04	1,000	1.00	1.10	60	0.6	0.85	37.9	7.2	45		
001001	2	1,186	21	186	90%	18.9	167.2	0.4	0.04	2,000	0.50	0.70	60	0.6	0.85	2.3	4.0	6		
001001	3	711	27	90	100%	26.5	89.6	0.4	0.04	2,500	0.20	0.03	90	0.6	0.75	1.3	0.1	1		
001001	4	1,977	52	515	50%	26.0	257.6	0.4	0.04	2,500	0.20	0.03	60	0.6	0.85	1.2	0.3	2		
001002	1	1,095	20	226	100%	19.9	225.6	0.4	0.04	1,500	0.90	1.05	60	0.6	0.85	4.3	8.1	12		
001002	2	1,921	31	180	25%	7.7	45.1	0.4	0.04	5,000	0.10	0.02	60	0.6	0.85	0.2	0.0	0		
001002	3	1,417	33	181	25%	8.3	45.3	0.4	0.04	5,000	0.10	0.02	60	0.6	0.85	0.2	0.0	0		
010300	1	1,584	38	272	100%	38.1	271.7	0.4	0.04	1,500	0.90	1.05	60	0.6	0.85	8.2	9.7	18		
010300	2	1,843	9	190	25%	2.2	47.5	0.4	0.04	2,500	0.20	0.03	60	0.6	0.85	0.1	0.0	0		
010300	3	3,394	32	373	45%	14.4	167.9	0.4	0.04	2,000	0.50	0.70	60	0.6	0.85	1.7	4.0	6		
010400	2	1,349	35	179	100%	35.4	179.1	0.4	0.04	2,500	0.20	0.03	60	0.6	0.85	1.7	0.2	2		
010400	4	1,210	11	150	50%	5.5	75.2	0.4	0.04	2,500	0.20	0.03	60	0.6	0.85	0.3	0.1	0		
010500	3	1,132	54	154	45%	24.4	69.2	0.4	0.04	5,000	0.10	0.02	60	0.6	0.85	0.6	0.0	1		
010801	1	1,441	32	333	45%	14.4	149.8	0.4	0.04	2,500	0.20	0.03	60	0.6	0.85	0.7	0.2	1		
010801	2	1,692	29	126	60%	17.2	75.6	0.4	0.04	1,500	0.90	1.05	60	0.6	0.85	3.7	2.7	6		
010802	1	1,950	96	352	15%	14.4	52.7	0.4	0.04	5,000	0.10	0.02	60	0.6	0.85	0.3	0.0	0		
011100	1	1,212	0	236	15%	0.0	35.3	0.4	0.04	5,000	0.10	0.02	60	0.6	0.85	0.0	0.0	0		
011100	3	1,445	48	279	0%	0.0	0.0	0.4	0.04	5,000	0.10	0.02	60	0.6	0.85	0.0	0.0	0		
011201	1	1,331	30	151	15%	4.5	22.7	0.4	0.04	5,000	0.10	0.02	60	0.6	0.85	0.1	0.0	0		
011201	2	4,823	193	517	15%	29.0	77.6	0.4	0.04	5,000	0.10	0.02	60	0.6	0.85	0.7	0.0	1		
011201	3	1,232	54	102	60%	32.5	61.0	0.4	0.04	2,000	0.50	0.70	60	0.6	0.85	3.9	1.5	5		
011202	1	909	9	107	5%	0.4	5.4	0.4	0.04	5,000	0.10	0.02	60	0.6	0.85	0.0	0.0	0		
011202	2	983	0	65	5%	0.0	3.3	0.4	0.04	5,000	0.10	0.02	60	0.6	0.85	0.0	0.0	0		
011202	3	1,164	9	86	25%	2.2	21.6	0.4	0.04	2,500	0.20	0.03	60	0.6	0.85	0.1	0.0	0		
011301	1	3,319	35	278	50%	17.7	138.8	0.4	0.04	5,000	0.10	0.02	90	0.6	0.75	0.4	0.1	0		
<b>Subtotal</b>		<b>81,577</b>	<b>4,285</b>	<b>12,452</b>		<b>3,476</b>	<b>8,388</b>											<b>Estimated Weekday Ridership</b>		<b>1,125</b>
																	<b>Transfers:</b>		<b>225</b>	

Source: LSC, 2009.

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The fixed-route model was used to estimate ridership for the alternative service concepts, which were incorporated into the model by changing the percentage of households served by transit, walking distance, and frequency of service. The model was applied to each of the transit service alternatives presented in this document.

LSC also created an ideal fixed-route model based on several assumptions in order to create a basis to compare the existing fixed-route service. The assumptions included headways, destinations of the route structure throughout the community, and access to transit routes. Based on these assumptions, LSC generated the estimated demand for an ideal fixed-route transit service. LSC used 30-minute headways on all the routes, an average walking distance of 1,200 feet to the route, and 100 percent of all households having access to transit. The assumed distance the average individual would walk to access transit service is 1,200 feet. The model generated about 2,944 daily trips and 903,800 annual trips based on 255 days of operation, as presented in Table VII-6.

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**Table VII-6  
2008 Estimated Fixed-Route Model - County Transit Service Area (Urban)**

Census Tract	Block Group	Total # of HHlds 2007	# of HHlds with		% of HHlds with Transit Access	HHlds Served by Transit		Basic Transit Trip Rates		Walk Distance (ft)	Walk Factor		Headway (min)	Headway Factor		Daily Transit Trips		Daily Trips # of
			0 Auto	1 Auto		0 Auto	1 Auto	0 Auto	1 Auto		0 Auto	1 Auto		0 Auto	1 Auto	0 Auto	1 Auto	
000100	1	1,205	60	189	100%	59.7	189.1	0.4	0.04	1,200	0.90	1.05	30	1.4	1.5	30.1	11.9	42
000100	2	2,237	59	384	100%	58.6	383.7	0.4	0.04	1,200	0.90	1.05	30	1.4	1.5	29.5	24.2	54
000200	1	2,907	112	488	100%	111.7	487.6	0.4	0.04	1,200	0.90	1.05	30	1.4	1.5	56.3	30.7	87
000200	2	1,360	18	154	100%	18.0	154.0	0.4	0.04	1,200	0.90	1.05	30	1.4	1.5	9.1	9.7	19
000301	1	1,301	29	167	100%	28.7	167.0	0.4	0.04	1,200	0.90	1.05	30	1.4	1.5	14.5	10.5	25
000301	2	2,733	145	343	100%	144.8	342.8	0.4	0.04	1,200	0.90	1.05	30	1.4	1.5	73.0	21.6	95
000302	1	866	63	138	100%	63.0	138.2	0.4	0.04	1,200	0.90	1.05	30	1.4	1.5	31.8	8.7	40
000302	2	2,171	133	370	100%	132.7	370.4	0.4	0.04	1,200	0.90	1.05	30	1.4	1.5	66.9	23.3	90
000400	1	828	154	93	100%	153.7	92.9	0.4	0.04	1,200	0.90	1.05	30	1.4	1.5	77.5	5.9	83
000400	2	633	113	151	100%	113.0	151.0	0.4	0.04	1,200	0.90	1.05	30	1.4	1.5	57.0	9.5	66
000400	3	971	277	224	100%	277.0	224.0	0.4	0.04	1,200	0.90	1.05	30	1.4	1.5	139.6	14.1	154
000500	1	1,393	203	298	100%	203.0	298.0	0.4	0.04	1,200	0.90	1.05	30	1.4	1.5	102.3	18.8	121
000500	2	1,735	180	266	100%	180.2	266.5	0.4	0.04	1,200	0.90	1.05	30	1.4	1.5	90.8	16.8	108
000500	3	1,859	44	367	100%	44.2	367.1	0.4	0.04	1,200	0.90	1.05	30	1.4	1.5	22.3	23.1	45
000601	1	1,541	72	333	100%	71.9	332.8	0.4	0.04	1,200	0.90	1.05	30	1.4	1.5	36.2	21.0	57
000601	2	1,164	53	290	100%	53.1	289.7	0.4	0.04	1,200	0.90	1.05	30	1.4	1.5	26.7	18.2	45
000602	1	815	30	171	100%	29.9	171.4	0.4	0.04	1,200	0.90	1.05	30	1.4	1.5	15.0	10.8	26
000602	2	2,329	145	551	100%	144.8	550.6	0.4	0.04	1,200	0.90	1.05	30	1.4	1.5	73.0	34.7	108
000700	1	1,498	318	343	100%	318.4	342.8	0.4	0.04	1,200	0.90	1.05	30	1.4	1.5	160.5	21.6	182
000700	2	1,161	61	178	100%	60.8	178.0	0.4	0.04	1,200	0.90	1.05	30	1.4	1.5	30.6	11.2	42
000700	3	912	129	128	100%	129.4	128.3	0.4	0.04	1,200	0.90	1.05	30	1.4	1.5	65.2	8.1	73
000800	1	1,155	364	250	100%	363.8	249.9	0.4	0.04	1,200	0.90	1.05	30	1.4	1.5	183.3	15.7	199
000800	2	1,253	83	258	100%	82.9	257.6	0.4	0.04	1,200	0.90	1.05	30	1.4	1.5	41.8	16.2	58
000800	3	1,602	60	292	100%	59.7	291.9	0.4	0.04	1,200	0.90	1.05	30	1.4	1.5	30.1	18.4	48
000900	1	1,616	236	282	100%	235.5	281.9	0.4	0.04	1,200	0.90	1.05	30	1.4	1.5	118.7	17.8	136
000900	2	943	24	125	100%	24.3	124.9	0.4	0.04	1,200	0.90	1.05	30	1.4	1.5	12.3	7.9	20
000900	3	1,229	65	101	100%	65.2	100.6	0.4	0.04	1,200	0.90	1.05	30	1.4	1.5	32.9	6.3	39
001001	1	1,840	158	192	100%	158.1	192.4	0.4	0.04	1,200	0.90	1.05	30	1.4	1.5	79.7	12.1	92
001001	2	1,186	21	186	100%	21.0	185.7	0.4	0.04	1,200	0.90	1.05	30	1.4	1.5	10.6	11.7	22
001001	3	711	27	90	100%	26.5	89.6	0.4	0.04	1,200	0.90	1.05	30	1.4	1.5	13.4	5.6	19
001001	4	1,977	52	515	100%	52.0	515.2	0.4	0.04	1,200	0.90	1.05	30	1.4	1.5	26.2	32.5	59
001002	1	1,095	20	226	100%	19.9	225.6	0.4	0.04	1,200	0.90	1.05	30	1.4	1.5	10.0	14.2	24
001002	2	1,921	31	180	100%	31.0	180.2	0.4	0.04	1,200	0.90	1.05	30	1.4	1.5	15.6	11.4	27
001002	3	1,417	33	181	100%	33.2	181.3	0.4	0.04	1,200	0.90	1.05	30	1.4	1.5	16.7	11.4	28
010300	1	1,584	38	272	100%	38.1	271.7	0.4	0.04	1,200	0.90	1.05	30	1.4	1.5	19.2	17.1	36
010300	2	1,843	9	190	100%	8.8	190.2	0.4	0.04	1,200	0.90	1.05	30	1.4	1.5	4.5	12.0	16
010300	3	3,394	32	373	100%	32.0	373.0	0.4	0.04	1,200	0.90	1.05	30	1.4	1.5	16.1	23.5	40
010400	2	1,349	35	179	100%	35.4	179.1	0.4	0.04	1,200	0.90	1.05	30	1.4	1.5	17.8	11.3	29
010400	4	1,210	11	150	100%	11.0	150.3	0.4	0.04	1,200	0.90	1.05	30	1.4	1.5	5.5	9.5	15
010500	3	1,132	54	154	100%	54.2	153.7	0.4	0.04	1,200	0.90	1.05	30	1.4	1.5	27.3	9.7	37
010801	1	1,441	32	333	100%	32.1	332.8	0.4	0.04	1,200	0.90	1.05	30	1.4	1.5	16.2	21.0	37
010801	2	1,692	29	126	100%	28.7	126.0	0.4	0.04	1,200	0.90	1.05	30	1.4	1.5	14.5	7.9	22
010801	3				100%				0.04				30					
010802	1	1,950	96	352	100%	96.2	351.6	0.4	0.04	1,200	0.90	1.05	30	1.4	1.5	48.5	22.2	71
011100	1	1,212	0	236	100%	0.0	235.5	0.4	0.04	1,200	0.90	1.05	30	1.4	1.5	0.0	14.8	15
011100	3	1,445	48	279	100%	47.5	278.6	0.4	0.04	1,200	0.90	1.05	30	1.4	1.5	24.0	17.6	42
011201	1	1,331	30	151	100%	30.3	151.3	0.4	0.04	1,200	0.90	1.05	30	1.4	1.5	15.2	9.5	25
011201	2	4,823	193	517	100%	193.5	517.4	0.4	0.04	1,200	0.90	1.05	30	1.4	1.5	97.5	32.6	130
011201	3	1,232	54	102	100%	54.2	101.7	0.4	0.04	1,200	0.90	1.05	30	1.4	1.5	27.3	6.4	34
011202	1	909	9	107	100%	8.8	107.2	0.4	0.04	1,200	0.90	1.05	30	1.4	1.5	4.5	6.8	11
011202	2	983	0	65	100%	0.0	65.2	0.4	0.04	1,200	0.90	1.05	30	1.4	1.5	0.0	4.1	4
011202	3	1,164	9	86	100%	8.8	86.2	0.4	0.04	1,200	0.90	1.05	30	1.4	1.5	4.5	5.4	10
011301	1	3,319	35	278	100%	35.4	277.5	0.4	0.04	1,200	0.90	1.05	30	1.4	1.5	17.8	17.5	35
<b>Subtotal</b>		<b>81,577</b>	<b>4,285</b>	<b>12,452</b>		<b>4,285</b>	<b>12,452</b>			<b>Estimated Weekday Ridership</b>								<b>2,944</b>

Source: LSC, 2009.

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## **ADA ELIGIBILITY MODEL**

LSC prepared transit demand estimates for the demand-response ridership based on a methodology developed by the FTA. The factors used in this methodology included demographics, eligibility criteria, service area, availability of other services, socioeconomic characteristics, service characteristics, and fares.

The low-demand and high-demand estimates produced with this methodology are shown in Table VII-7. The demand estimates were calculated by US Census block group and show current demand for paratransit services within the Washington County Transit service area. The annual trip demand for the study area's certified paratransit population ranges from about 15,215 to 33,743. The certified paratransit population range is consistent with Washington County Transit's paratransit ridership of about 22,245 annual trips (paratransit and SSTAP trips).

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**Table VII-7  
Complementary Paratransit Demand**

Census Tract	Census Block Group	Total 2008 Population	% of Mobility Limited Population 2008	Mobility-Limited Population	ADA Eligibility Factor	Estimate of ADA Eligible Population	Certification Factor	Estimate of Certified Population	Trip Rates (1) per Eligible Person Per Month		Eligible Population Annual Trips		Certified Population Annual Trips	
									Low	High	Low	High	Low	High
000100	1	1,205	4.7%	56	60.0%	34	0.25	14	1.0	2.2	406	893	169	372
000100	2	2,237	2.2%	49	60.0%	29	0.25	12	1.0	2.2	350	771	146	321
000200	1	2,907	5.1%	148	60.0%	89	0.25	37	1.0	2.2	1,067	2,347	444	978
000200	2	1,360	4.9%	67	60.0%	40	0.25	17	1.0	2.2	482	1,061	201	442
000301	1	1,301	17.0%	221	60.0%	133	0.25	55	1.0	2.2	1,592	3,503	663	1,459
000301	2	2,733	9.5%	260	60.0%	156	0.25	65	1.0	2.2	1,871	4,116	779	1,715
000302	1	866	6.4%	55	60.0%	33	0.25	14	1.0	2.2	398	876	166	365
000302	2	2,171	6.0%	129	60.0%	78	0.25	32	1.0	2.2	931	2,049	388	854
000400	1	828	6.7%	55	60.0%	33	0.25	14	1.0	2.2	398	876	166	365
000400	2	633	6.3%	40	60.0%	24	0.25	10	1.0	2.2	288	634	120	264
000400	3	971	8.3%	81	60.0%	49	0.25	20	1.0	2.2	583	1,283	243	535
000500	1	1,393	11.1%	155	60.0%	93	0.25	39	1.0	2.2	1,116	2,455	465	1,023
000500	2	1,735	5.1%	88	60.0%	53	0.25	22	1.0	2.2	637	1,401	265	584
000500	3	1,859	6.3%	117	60.0%	70	0.25	29	1.0	2.2	844	1,856	352	774
000601	1	1,541	7.7%	118	60.0%	71	0.25	30	1.0	2.2	852	1,874	355	781
000601	2	1,164	5.0%	59	60.0%	35	0.25	15	1.0	2.2	422	928	176	387
000602	1	815	4.5%	36	60.0%	22	0.25	9	1.0	2.2	263	578	109	241
000602	2	2,329	9.8%	229	60.0%	137	0.25	57	1.0	2.2	1,648	3,625	687	1,511
000700	1	1,498	16.8%	251	60.0%	151	0.25	63	1.0	2.2	1,807	3,976	753	1,656
000700	2	1,161	4.3%	50	60.0%	30	0.25	12	1.0	2.2	358	788	149	328
000700	3	912	4.0%	36	60.0%	22	0.25	9	1.0	2.2	263	578	109	241
000800	1	1,155	19.3%	223	60.0%	134	0.25	56	1.0	2.2	1,608	3,538	670	1,474
000800	2	1,253	5.6%	71	60.0%	42	0.25	18	1.0	2.2	509	1,121	212	467
000800	3	1,602	8.9%	143	60.0%	86	0.25	36	1.0	2.2	1,027	2,259	428	941
000900	1	1,616	9.0%	145	60.0%									
000900	2	943	7.2%	67	60.0%	40	0.25	17	1.0	2.2	486	1,068	202	445
000900	3	1,229	4.1%	51	60.0%	31	0.25	13	1.0	2.2	366	806	153	336
001001	1	1,840	4.4%	81	60.0%	48	0.25	20	1.0	2.2	581	1,278	242	533
001001	2	1,186	11.4%	135	60.0%	81	0.25	34	1.0	2.2	971	2,137	405	890
001001	3	711	5.8%	41	60.0%	25	0.25	10	1.0	2.2	295	648	123	270
001001	4	1,977	6.6%	130	60.0%	78	0.25	33	1.0	2.2	939	2,067	391	861
001002	1	1,095	6.2%	67	60.0%	40	0.25	17	1.0	2.2	486	1,068	202	445
001002	2	1,921	7.0%	135	60.0%	81	0.25	34	1.0	2.2	971	2,137	405	890
001002	3	1,417	3.7%	53	60.0%	32	0.25	13	1.0	2.2	382	841	159	350
010300	1	1,584	7.0%	111	60.0%	67	0.25	28	1.0	2.2	798	1,756	333	732
010300	2	1,843	3.1%	56	60.0%	34	0.25	14	1.0	2.2	406	893	169	372
010300	3	3,394	2.9%	97	60.0%	58	0.25	24	1.0	2.2	700	1,541	292	642
010400	2	1,349	5.3%	72	60.0%	43	0.25	18	1.0	2.2	517	1,138	216	474
010400	4	1,210	12.7%	154	60.0%	92	0.25	38	1.0	2.2	1,109	2,439	462	1,016
010500	3	1,132	3.9%	44	60.0%	27	0.25	11	1.0	2.2	318	701	133	292
010801	1	1,441	10.0%	144	60.0%	86	0.25	36	1.0	2.2	1,035	2,277	431	949
010801	2	1,692	2.5%	42	60.0%	25	0.25	11	1.0	2.2	303	666	126	277
010802	1	1,950	5.7%	111	60.0%	66	0.25	28	1.0	2.2	796	1,751	332	730
011100	1	1,212	7.8%	95	60.0%	57	0.25	24	1.0	2.2	685	1,506	285	628
011100	3	1,445	3.6%	52	60.0%	31	0.25	13	1.0	2.2	374	823	156	343
011201	1	1,331	4.2%	56	60.0%	33	0.25	14	1.0	2.2	401	882	167	367
011201	2	4,823	5.3%	254	60.0%	153	0.25	64	1.0	2.2	1,831	4,028	763	1,678
011201	3	1,232	0.7%	9	60.0%	5	0.25	2	1.0	2.2	64	140	27	58
011202	1	909	4.6%	42	60.0%	25	0.25	11	1.0	2.2	303	666	126	277
011202	2	983	6.5%	64	60.0%	38	0.25	16	1.0	2.2	462	1,016	192	423
011202	3	1,164	4.6%	53	60.0%	32	0.25	13	1.0	2.2	382	841	159	350
011301	1	3,319	3.5%	116	60.0%	70	0.25	29	1.0	2.2	836	1,839	348	766
<b>Total</b>		<b>125,295</b>	<b>6%</b>	<b>7,472</b>		<b>3,043</b>		<b>1,268</b>			<b>36,516</b>	<b>80,336</b>	<b>15,215</b>	<b>33,473</b>

(1) Source: Survey of 7 "exemplary" paratransit operators. Crain, Et al. "Working Paper 6: Service Needs Analysis, San Francisco Bay Area Regional Paratransit Plan," Jan. 1990.

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## **GREATEST TRANSIT NEED ANALYSIS**

The “greatest transit need” is defined as those portions of the study area with the highest percentage of zero-vehicle households and elderly, disabled, and below-poverty populations. This information was used to develop the transit service plan and identify the appropriate service district boundaries.

### **Methodology**

The data included in Chapter III were used to calculate the greatest transit need. The categories used for the calculation were zero-vehicle households, elderly population, disabled population, and below-poverty population. Using these categories, LSC developed a “transit need index” to determine the greatest transit need. The percentage of the population for each US Census block group within each category was calculated, placed in numerical order, and divided into six segments. Six segments were chosen in order to reflect a reasonable range. Each segment contained an approximately equal number of US Census block groups in order to provide equal representation.

The US Census block groups in the segment with the lowest percentages were given a score of one. The block groups in the segment with the next lowest percentages were given a score of two, and so on. The blocks groups in the segment with the highest percentages were given a score of five. This scoring was completed for each of the categories (zero-vehicle households, elderly population, disabled population, and below-poverty population). After each of the block groups was scored for the four categories, the four scores were added up to achieve an overall score. Table VII-8 presents the ranked scores for each US Census block group in Washington County. The scores range from four (lowest need) to 20 (highest need).

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**Table VII-8  
2008 Greatest Transit Need Scores by Census Tracts  
Washington County**

Census Tract	Census Block Group	Land Area (sq.mi.)	Zero-Vehicle Hhlds			Total # of Hhlds	Total Number of Elderly 60 & over			Mobility-Limited Population			Below-Poverty Population			Overall Score (4-20)	Final (1-5)	Total Population (Persons)
			#	%	rank		#	%	rank	#	%	rank	#	%	rank			
000100	1	0.16	60	11.5%	3	517	227	18.8%	2	51	4.2%	3	112	9.3%	2	10	3	1,205
000100	2	0.57	59	5.7%	2	1,028	415	18.5%	2	115	5.1%	3	190	8.5%	2	9	3	2,237
000200	1	0.60	112	8.3%	2	1,343	619	21.3%	3	397	13.7%	4	125	4.3%	2	11	3	2,907
000200	2	0.57	18	3.8%	2	475	349	25.7%	3	64	4.7%	3	57	4.2%	2	10	3	1,360
000301	1	0.49	29	6.0%	2	481	282	21.7%	3	72	5.5%	3	184	14.1%	3	11	3	1,301
000301	2	0.74	145	13.4%	3	1,084	547	20.0%	3	193	7.1%	3	280	10.2%	3	12	4	2,733
000302	1	0.08	63	18.3%	3	345	111	12.8%	2	103	11.9%	4	208	24.0%	4	13	4	866
000302	2	0.14	133	15.5%	3	854	224	10.3%	1	192	8.9%	3	406	18.7%	3	10	3	2,171
000400	1	0.16	154	47.6%	5	323	157	19.0%	2	513	61.9%	5	236	28.4%	4	16	5	828
000400	2	0.10	113	39.9%	4	283	90	14.2%	2	450	71.1%	5	209	33.0%	5	16	5	633
000400	3	0.13	277	47.5%	5	583	236	24.3%	3	261	26.9%	4	372	38.3%	5	17	5	971
000500	1	0.11	203	30.0%	4	676	161	11.6%	2	330	23.7%	4	220	15.8%	3	13	4	1,393
000500	2	0.10	180	25.6%	4	703	145	8.3%	1	272	15.7%	4	286	16.5%	3	12	4	1,735
000500	3	0.62	44	5.7%	2	782	353	19.0%	2	154	8.3%	3	396	21.3%	4	11	3	1,859
000601	1	0.57	72	10.6%	3	678	364	23.6%	3	240	15.6%	4	161	10.5%	3	13	4	1,541
000601	2	0.21	53	10.1%	3	526	132	11.3%	2	108	9.3%	3	207	17.8%	3	11	3	1,164
000602	1	0.94	30	8.0%	2	374	167	20.5%	3	32	3.9%	3	82	10.0%	3	11	3	815
000602	2	1.23	145	14.0%	3	1,036	701	30.1%	4	205	8.8%	3	398	17.1%	3	13	4	2,329
000700	1	0.12	318	42.6%	5	747	369	24.6%	3	124	8.3%	3	462	30.8%	5	16	5	1,498
000700	2	0.11	61	15.9%	3	384	148	12.8%	2	114	9.8%	3	251	21.6%	4	12	4	1,161
000700	3	0.30	129	36.0%	4	359	154	16.8%	2	255	28.0%	4	339	37.2%	5	15	5	912
000800	1	0.13	364	51.5%	5	707	484	41.9%	5	101	8.7%	3	386	33.4%	5	18	5	1,155
000800	2	0.14	83	14.4%	3	575	146	11.7%	2	103	8.2%	3	168	13.4%	3	11	3	1,253
000800	3	0.18	60	8.9%	2	671	304	19.0%	2	42	2.6%	3	133	8.3%	2	9	3	1,602
000900	1	0.13	236	33.4%	4	705	202	12.5%	2	170	10.5%	4	505	31.3%	5	15	5	1,616
000900	2	1.48	24	7.2%	2	339	130	13.8%	2	24	2.6%	3	132	14.0%	3	10	3	943
000900	3	0.78	65	21.2%	4	307	64	5.2%	1	324	26.3%	4	269	21.9%	4	13	4	1,229
001001	1	0.44	158	27.1%	4	583	109	5.9%	1	425	23.1%	4	575	31.3%	5	14	4	1,840
001001	2	0.30	21	4.2%	2	502	428	36.1%	4	12	1.0%	2	65	5.5%	2	10	3	1,186
001001	3	1.35	27	10.2%	3	261	96	13.5%	2	59	8.2%	3	112	15.7%	3	11	3	711
001001	4	0.46	52	5.1%	2	1,025	577	29.2%	3	132	6.7%	3	48	2.4%	1	9	3	1,977
001002	1	0.22	20	4.8%	2	418	151	13.8%	2	91	8.3%	3	220	20.1%	4	11	3	1,095
001002	2	0.53	31	4.2%	2	739	419	21.8%	3	31	1.6%	2	32	1.7%	1	8	2	1,921
001002	3	0.96	33	5.7%	2	579	321	22.6%	3	87	6.2%	3	46	3.3%	1	9	3	1,417
010100	1	4.09	15	2.6%	2	595	276	19.0%	2	107	7.4%	3	31	2.1%	1	8	2	1,458
010200	1	11.25	12	2.7%	2	451	245	16.6%	2	18	1.2%	2	85	5.8%	2	8	2	1,475
010200	2	6.51	0	0.0%	1	308	117	11.6%	2	63	6.2%	3	71	7.0%	2	8	2	1,013
010200	3	3.00	6	1.4%	2	388	244	23.4%	3	21	2.0%	2	27	2.5%	1	8	2	1,045
010200	4	12.21	0	0.0%	1	589	254	17.5%	2	51	3.5%	3	77	5.3%	2	8	2	1,451
010300	1	5.61	38	5.1%	2	748	518	32.7%	4	39	2.5%	2	86	5.4%	2	10	3	1,584
010300	2	2.53	9	1.5%	2	608	473	25.7%	3	115	6.2%	3	25	1.4%	1	9	3	1,843
010300	3	1.52	32	2.5%	2	1,299	917	27.0%	3	248	7.3%	3	56	1.7%	1	9	3	3,394
010400	1	9.07	20	3.5%	2	562	188	10.1%	1	9	0.5%	1	81	4.4%	2	6	1	1,853
010400	2	0.78	35	5.5%	2	641	321	23.8%	3	14	1.1%	2	144	10.7%	3	10	3	1,349
010400	3	5.41	0	0.0%	1	546	338	21.3%	3	27	1.7%	2	53	3.3%	1	7	1	1,590
010400	4	5.43	11	2.2%	2	510	357	29.5%	3	11	0.9%	1	68	5.7%	2	8	2	1,210
010500	1	13.39	40	6.9%	2	580	271	16.4%	2	57	3.5%	3	98	5.9%	2	9	3	1,654
010500	2	5.18	21	2.6%	2	799	342	15.0%	2	6	0.2%	1	191	8.4%	2	7	1	2,274
010500	3	3.98	54	10.4%	3	521	279	24.6%	3	41	3.6%	3	18	1.6%	1	10	3	1,132
010500	4	9.59	0	0.0%	1	347	147	15.9%	2	8	0.8%	1	30	3.2%	1	5	1	925
010600	1	23.60	65	7.0%	2	935	336	12.5%	2	55	2.0%	2	195	7.2%	2	8	2	2,699
010600	2	11.34	25	7.1%	2	356	122	13.1%	2	6	0.6%	1	53	5.7%	2	7	1	927
010600	3	12.52	32	8.1%	2	394	273	27.4%	3	0	0.0%	1	0	0.0%	1	7	1	995
010600	4	28.31	21	7.1%	2	295	143	20.4%	3	10	1.4%	2	55	7.9%	2	9	3	700
010700	1	10.00	0	0.0%	1	336	166	19.0%	2	30	3.4%	3	48	5.5%	2	8	2	871
010700	2	13.00	105	10.4%	3	1,013	477	19.9%	2	40	1.7%	2	380	15.9%	3	10	3	2,394
010700	3	32.68	0	0.0%	1	291	133	15.5%	2	7	0.8%	1	111	12.9%	3	7	1	857
010801	1	2.62	32	4.8%	2	672	360	25.0%	3	8	0.5%	1	135	9.4%	2	8	2	1,441
010801	2	0.84	29	5.1%	2	562	451	26.7%	3	0	0.0%	1	34	2.0%	1	7	1	1,692
010801	3	4.05	46	21.3%	4	218	159	29.1%	3	31	5.7%	3	74	13.6%	3	13	4	546
010802	1	1.30	96	12.4%	3	773	483	24.8%	3	29	1.5%	2	150	7.7%	2	10	3	1,950
010802	2	5.52	118	20.0%	4	592	562	49.6%	5	32	2.8%	3	67	6.0%	2	14	4	1,133
010900	1	5.01	0	0.0%	1	730	281	13.0%	2	126	5.8%	3	31	1.4%	1	7	1	2,167
010900	2	8.23	12	2.0%	2	599	281	19.1%	2	18	1.2%	2	144	9.8%	2	8	2	1,468
010900	3	20.15	0	0.0%	1	672	264	14.5%	2	44	2.4%	2	187	10.3%	3	8	2	1,820
010900	4	11.52	11	1.9%	2	597	233	14.4%	2	0	0.0%	1	80	4.9%	2	7	1	1,620
011000	1	0.51	0	0.0%	1	0	0	0.0%	1	2,543	76.4%	5	0	0.0%	1	8	2	3,328
011000	2	0.61	0	0.0%	1	0	0	0.0%	1	0	0.0%	1	0	0.0%	1	4	1	0
011000	3	0.62	0	0.0%	1	0	34	0.8%	1	3,089	72.7%	5	0	0.0%	1	8	2	4,248
011100	1	0.32	0	0.0%	1	576	444	36.7%	4	15	1.3%	2	9	0.7%	1	8	2	1,212
011100	2	1.32	23	2.5%	2	927	286	13.9%	2	380	18.5%	4	77	3.8%	1	9	3	2,054
011100	3	1.02	48	7.7%	2	615	263	18.2%	2	41	2.8%	3	117	8.1%	2	9	3	1,445
011100	4	6.00	11	2.7%	2	410	195	16.9%	2	18	1.5%	2	50	4.3%	2	8	2	1,152
011201	1	2.36	30	5.5%	2	552	341	25.6%	3	57	4.3%	3	138	10.4%	3	11	3	1,331
011201	2	3.60	193	10.1%	3	1,913	726	15.1%	2	543	11.3%	4	314	6.5%	2	11	3	4,823
011201	3	0.44	54	10.9%	3	496	237	19.2%	2	125	10.1%	4	57	4.7%	2	11	3	1,232
011202	1	4.26	9	2.4%	2	364	161	17.8%	2	40	4.4%	3	55	6.1%	2	9	3	909
011202	2	5.59	0	0.0%	1	359	184	18.7%	2	50	5.1%	3	40	4.0%	2	8	2	983
011202	3	3.23	9	2.1%	2	431	220	18.9%	2	0	0.0%	1	67	5.8%	2	7	1	1,164
011301	1	4.03	35	3.0%	2	1,179	474	14.3%	2	117	3.5%	3	251	7.6%	2	9	3	3,319
011301	2	10.85	30	6.0%	2	494	181	13.3%	2	62	4.5%	3	67					

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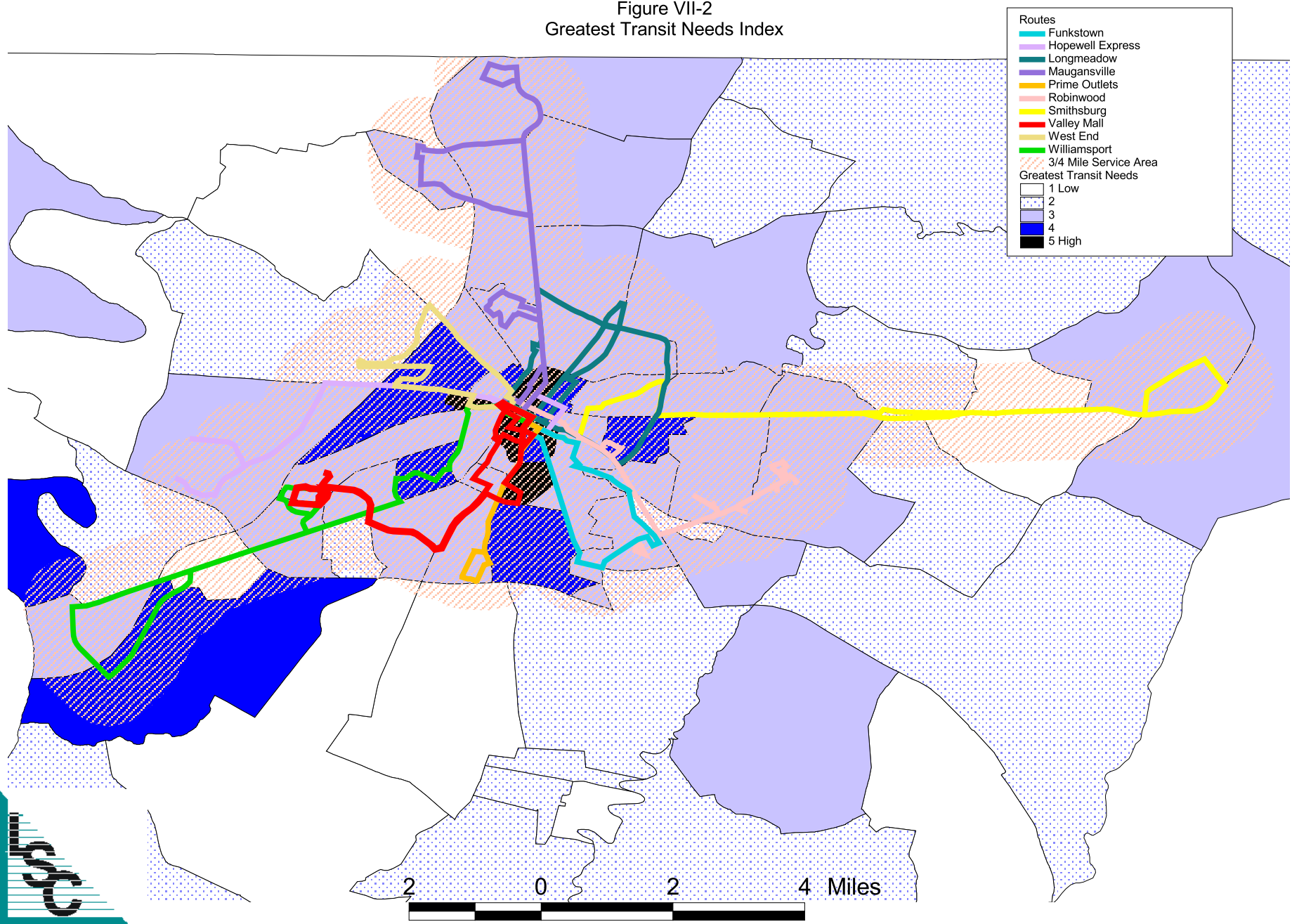
**Results**

Figure VII-2 presents the Washington County US Census block groups with the greatest transit need, along with the transit need index. Seven block groups were determined to have the greatest transit need based on zero-vehicle households, elderly population, disabled population, and below-poverty population. Table VII-9 presents information on these seven block groups. The greatest transit needs are mainly in Hagerstown. There are a few other areas outside of Hagerstown that have been identified as having the greatest transit need including the Williamsport area, the county’s panhandle portion, and the county’s southern portion.

<b>Table VII-9</b> <b>US Census Block Groups With Greatest Transit Need</b>		
<b>Census Tract</b>	<b>Census Block Groups</b>	<b>Description</b>
000400	1	West of Prospect, north side of Hagerstown
000400	2	East of Pennsylvania, north side of Hagerstown
000400	3	Western Downtown Hagerstown
000700	1	King Street and Bixler in Hagerstown
000700	3	South of Memorial on the south side of Hagerstown
000800	1	Summit Street, south side of Hagerstown
000900	1	North of State Street, south of US 40 in Hagerstown
<i>Source: US Census 2000, and LSC 2009.</i>		

By identifying those areas with a high need for public transportation, LSC was able to uncover a pattern for the areas with the highest propensity to use transit service. As LSC examines different future transit scenarios, Figure VII-2 was used in the service alternatives analysis to ensure that areas with a high transit need will be adequately served. Those US Census block groups not scoring in the highest category, but still having a high score, can still be considered a high priority for transit service.

Figure VII-2  
Greatest Transit Needs Index



## **SUMMARY**

Chapter VII presented the methodologies for estimating the demand for Washington County Transit's public transportation services. The methodologies included the Rural Transit Demand Methodology, Fixed-Route Model, ADA Eligibility Model, and Greatest Transit Need Analysis. LSC used this information to develop and evaluate the various service alternatives for meeting Washington County's transit needs.